ARMED SERVICES BOARD OF CONTRACT APPEALS

Appeals of --	)	
	)	
Advanced Engineering & Planning	)	
Corporation, Inc.	)	
	)	ASBCA Nos. 53366, 54044
Under Contract No. N00024-94-H-8687	)	
Job Order No. 0072	)	

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OPINION BY ADMINISTRATIVE JUDGE TING

Advanced Engineering & Planning Corporation, Inc. (AEPCO), was awarded a restricted availability (RAV) job order by the Supervisor of Shipbuilding, Conversion and Repair, Portsmouth, Virginia (SUPSHIP Portsmouth) to perform certain ship alteration work on the USS MT. WHITNEY. AEPCO had initially appealed from the contracting officer's (CO's) failure to issue a decision on its 29 September 2000 Request for Equitable Adjustment (REA) which was not certified pursuant to the Contract Disputes Act of 1978, as amended, 41 U.S.C. §§ 601-613. The Board docketed the appeal as ASBCA No. 53366. AEPCO subsequently forwarded to the CO by letter dated 18 June 2001 a certified claim dated 30 April 2001 seeking $2,528,672. The CO again failed to issue a decision. By letter dated 16 December 2002, AEPCO appealed from the CO's failure to issue a decision pursuant to 41 U.S.C. § 605(c)(5). The Board docketed this appeal as ASBCA No. 54044, and consolidated the appeal with ASBCA No. 53366.

The consolidated appeals were the subject of the parties' cross-motions for summary judgment. The Board's decision on the cross-motions was issued on 21 January 2003. *Advanced Engineering & Planning Corporation, Inc.*, ASBCA Nos. 53366, 54044, 03-1 BCA ¶ 32,157. The Navy subsequently appealed the Board's decision to the United States District Court for the Eastern District of Virginia, seeking reversal of the Board's decision allowing AEPCO to recover preparation costs for its submission of a REA to the CO. The court affirmed the Board's decision by a memorandum opinion issued on 17 November 2003. *Johnson v. Advanced Engineering & Planning Corp.*, 292 F. Supp. 2d 846 (E.D. Va. 2003).

In this decision, we address the remaining disputes not disposed of by our decision on the parties' cross-motions for summary judgment and the district court decision. Both entitlement and quantum issues are before us.

PART I.

FINDINGS OF FACT ON ENTITLEMENT

1. On 16 December 1999, SUPSHIP Portsmouth issued Solicitation No. N62678-00-R-0066 (the solicitation)[1] (R4, tab 1). CLIN 0001 of the solicitation required the contractor to:

> PREPARE FOR AND ACCOMPLISH **RESTRICTED AVAILABILITY (RAV)** OF THE **USS MT WHITNEY (LCC-20)** AS DELINEATED IN SPECIFICATION PACKAGE # **SSP-073-00** AND AS SPECIFIED HEREIN AND IN ACCORDANCE WITH STANDARD ITEMS, WORK ITEM SPECIFICATIONS, DRAWINGS, TEST PROCEDURES AND OTHER DETAILED DATA PROVIDED BY THE GOVERNMENT IN ACCORDANCE WITH SECTION J.

(*Id.* at 4 of 66)

2. On a RAV, the contractor has to be able "to put the ship back together in 96 hours so it can go back to the fleet in case of emergency" (tr. 240). SUPSHIP

[1] The solicitation was sent to all actively participating companies possessing an Agreement for Boat Repair (ABR) or Master Ship Repair Agreement (MSRA) within the determined proposal area (R4, tab 221). At the time AEPCO bid on the MT. WHITNEY job order, it held an ABR only (tr. 309).

Portsmouth does not control availability dates (tr. 224). The Chief of Naval Operations dictates the time period available for performance, known as "CNO dates" (tr. 145, 149).

3. The CNO dates for the MT. WHITNEY, as determined by the Commander, Naval Surface Force, United States Atlantic Fleet, commonly referred to as SURFLANT,[2] were from 12 January to 2 April 2000 (R4, tab 141; tr. 1817). The MT. WHITNEY was a "high profile" vessel (tr. 402). At the time of its availability, it was the flagship of the Second Fleet (tr. 402). There was little flexibility in terms of its availability. Immediately after the overhaul, the ship was required "to go through a series of training and certification requirements before [she] could operate." After sea trial, she was committed to participating in a "fleet-wide joint task force exercise." Following that, she was to host a presidential event in New York City on 4 July 2000. (Tr. 1736)

4. The solicitation provides that work on the vessel will be performed at the U.S. Naval Base, Norfolk, Virginia, and that the Navy agrees to make the vessel available no later than 10 January 2000, and the contractor agrees to complete work by 24 March 2000 (R4, tab 1 at 22 of 66, ¶¶ F-2, F-3). Paragraph F-3(a) provides:

> The foregoing delivery requirements are based on the assumption that the Government will make the award by **10 JANUARY 2000**. Each delivery date set forth in this paragraph will be extended by the number of calendar days after the above date that the job order is in fact awarded.

F-8, LIQUIDATED DAMAGES (NAVSEA) (JUN 1992), provides for $38,057.00 for each calendar day of delay in delivery of the vessel. (R4, tab 1 at 22 of 66)

5. The solicitation requires offerors to submit certain pre-award information, among them, manning schedule by specification item showing shift work and premium time aboard ship and in shop (¶ L-2-31(b)); and a list of all proposed subcontractors, by specification item, the nature and extent of work to be subcontracted, work schedules and completion dates (¶ L-2-31(d)(1)) (R4, tab 1 at 61, 62 of 66).

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[2] SURFLANT is a subordinate command to Commander, U.S. Fleet Forces Command (formerly Commander, U.S. Atlantic Fleet), which reports to Chief of Naval Operations. Its mission is to provide ready surface forces to joint-force commanders. In these appeals, SURFLANT was NAVSEA's customer. SUPSHIP Portsmouth, a component command of NAVSEA, procured and administered the MT. WHITNEY contract. NAVSEA reports to the Assistant Secretary of the Navy, Research, Development, and Acquisition (ASN/RDA) responsible for all acquisition matters within the Navy. (App. letter of 6 January 2004)

6. Shipalts are alteration work to be performed on a vessel. They are generated by a shipyard within NAVSEA not SUPSHIP Portsmouth. (Tr. 37-38) On 22 December 1999, six days after issuance of the solicitation, SUPSHIP Portsmouth issued Amendment No. 0001 to the solicitation. This amendment added four shipalts and stated that they "[s]hall be considered when submitting a proposal" on the MT. WHITNEY. (R4, tab 3; tr. 93)

7. The four shipalts covered by Amendment No. 0001 are:

ITEM NO.	TITLE
255-90-002	Shipalt LCC 20-1285K, Main Feed Pump Replace; Accomplish
537-90-002	Shipalt LCC 1072K, Install Encapsulated Lifeboats Main Deck; accomplish
593-90-002	Shipalt LCC 20-1200K, Metal Glass Shredder; accomplish
593-91-002	Shipalt LCC 20-1165K, Large Solid Waste Pulper; accomplish

(R4, tab 3 at 2)

8. The work involved in the replacement of the Main Feed Pumps (MFPs) was "basically plumbing work." As Captain Martin E. Jenkins, II (Captain Jenkins), Commanding Officer of the MT. WHITNEY testified, "Once the new pumps are on a foundation, it's a matter of just piping from the booster pumps to the feed pumps themselves, and from the feed pumps to the boiler." (Tr. 1742)

9. By Amendment No. 0002, dated 23 December 1999, SUPSHIP Portsmouth notified potential offerors that:

> 1. The proposal closing for the **USS MT. WHITNEY (LCC-20), SSP: 073-00** has been changed to: **05 JANUARY 00 AT 9:00 AM** vise [sic] 03 January 00.
>
> 2. An Additional Ship Check is scheduled for **27 DECEMBER 99.**

(R4, tab 4)

10. According to AEPCO, the drawings referenced in the shipalts were made available on the morning of 29 December 1999 (R4, tab 223). AEPCO's purchasing manager testified AEPCO picked up the shipalt drawings from its mailbox at SUPSHIP Portsmouth and they arrived around 30 December 1999. While some of the drawings

were in hard copies, others were in aperture cards and AEPCO had to send them out to have copies made. (Tr. 296, 340)

11. AEPCO's 29 December 1999 Request for Specification Clarification (No. 2) stated that there were 54 drawings that had to be reviewed prior to shipcheck and hundreds of line items required material take-offs and quotes from vendors. AEPCO said "IT WILL TAKE APPROX. 2-3 DAYS TO REVIEW ALL OF THE DRAWINGS BEFORE AN ADEQUATE SHIPCHECK CAN BE ACCOMPLISHED." AEPCO requested that the Navy provide another shipcheck and extend the proposal closing for two weeks to allow sufficient time to submit its proposal. (R4, tab 223)

12. On 30 December 1999, SUPSHIP Portsmouth issued Amendment No. 0006 extending the proposal closing from 5 January 2000 to 2 p.m., 6 January 2000, and scheduling an additional ship check on 3 January 2000 (R4, tab 8).

13. On 5 January 2000, SUPSHIP Portsmouth issued Amendment No. 0007 extending the proposal closing time from 6 January 2000 to 7 January 2000 at 9 a.m. The amendment also included ERRATA No. 2 which substituted new pages for three contract line items including the MFP and the large solid waste pulper shipalts. (R4, tab 9)

14. In a letter dated 6 January 2000, faxed to SUPSHIP Portsmouth, AEPCO's general manager, S. T. Winder (Winder), protested "any award . . . as the solicitation is currently written" because it "allows insufficient time to reasonably prepare a proposal." The letter stated that the shipalt drawings were not available until the afternoon of 30 December 1999 and had to be reproduced, and that it was still trying to gather material quotes as late as noon, 6 January 2000. The protest sought to move the proposal closing time to at least 2 p.m., 12 January 2000 (Wednesday). (R4, tab 224)

15. After extending the proposal closing time four times for a total of eight days, SUPSHIP Portsmouth decided not to extend it to 2 p.m., 12 January 2000, as requested. Instead, it issued Amendment No. 0008 on 6 January 2000 extending the proposal closing time from 7 January 2000 to 11 January 2000 (Tuesday) at 9:00 a.m. Amendment No. 0008 also changed the award date to 12 January 2000, and contract performance period to 12 January 2000 through 26 March 2000 (the CCD). (R4, tab 10; tr. 1817) There were 75 calendar days (CDs)[3] or 52 workdays between 12 January and 26 March 2000 (tr. 348).

16. R. Scott Davis (Davis), AEPCO's estimator, testified that he conducted a shipcheck, and that through working long hours "to make it happen," SUPSHIP

[3] March 26, 2000 was a Sunday. The 75 CD or 52 workday performance period assumed work would start immediately on 12 January 2000.

Portsmouth's extension to 9 a.m., 11 January 2000, did provide AEPCO enough time to complete its estimate and to put its proposal together. (R4, tab 528, Davis dep. at 28, 33)

17. Ship surveyors are SUPSHIP people who have a technical background. They oversee and monitor repair work aboard ships and are the project manager's "eyes on the ship." (Tr. 26) William H. Hunt (ship surveyor Hunt) was one of the two ship surveyors assigned to the MT. WHITNEY job order (tr. 741). Cecil Dale (project manager Dale) was project manager of the project (tr. 22). The "daily one-liners" are reports written by ship surveyors; they are forwarded to SUPSHIP Portsmouth's Program Management Division (Code 600) for its morning briefings. SUPSHIP Portsmouth's management keeps abreast of progress on a job through daily one-liners. (Tr. 33)

18. On 7 January 2000, several days prior to award of Job Order No. 0072, ship surveyor Hunt was advised by the Chief Engineer (CHENG) of the MT. WHITNEY that he wanted all work in the machinery space completed by 13 March 2000 so that the vessel could undergo sea trials between 27-30 March 2000 (tr. 57-58). Ship surveyor Hunt's RAV/TAV[4] one-liner of 7 January 2000 reported:

> 1. AWARD DATE MOVED TO RIGHT FROM TODAY'S DATE.
>
> 2. MEETING WITH CHENG REVEALED P.C.D. [PRODUCTION COMPLETION DATE] NEEDS TO BE NLT [NO LATER THAN] 13 MARCH '00 TO SUPPORT SHIP'S SCHEDULE.

(R4, tab 589; tr. 59, 1817)

19. The so-called Production Completion Date or "PCD" was not in this case "an internal milestone within the contract" (tr. 113, 2928-29). The PCD applies only to the machinery space of a vessel because that space had to be completed for the ship to go to sea trial (tr. 127, 1793). It was intended "to get the machinery plant in the hands of the ship's force so that they would be familiar enough to take the ship out to sea" (tr. 2929).

20. There is no evidence that either AEPCO or Phillip Fields, the procuring contracting officer, was aware of the PCD. SUPSHIP Portsmouth's Deputy Director of Contracts acknowledged that when the Navy becomes aware before award there is a need to accelerate, offerors should be advised (tr. 234). He also acknowledged that, to the extent a PCD was enforced, "a sequence should have been written" (tr. 236) inasmuch as the PCD could impact AEPCO's manning and whether it had to work premium time (tr.

[4] "TAV" stands for technical availability. Under a TAV, the contractor would have to be able to put the ship back in "48 hours." (Tr. 239-40)

356). Edward Stroud, the administrative contracting officer (ACO Stroud) of the MT. WHITNEY, testified that he had assumed that the PCD was a part of the contract, and had he been aware otherwise, he "would have requested a sequence be written to change the contract to reflect a PCD date" (tr. 1440). We find such acknowledgments on the part of SUPSHIP Portsmouth contracting officials to be a tacit admission that AEPCO was ordered to accelerate to meet the 13 March 2000 PCD.

21. At 7:35 a.m., 11 January 2000, AEPCO faxed to SUPSHIP Portsmouth a list of Long Lead Time Material (LLTM). The list shows LLTM that could take as long as 36 weeks to obtain. AEPCO's fax stated "PLEASE FIND ATTACHED A LIST OF LONG LEAD MATERIAL. PLEASE REVIEW AND ADVISE!" (R4, tab 509, document 5 of 5; tr. 99-100)

22. Even though the Navy could have discussed the LLTM problem with AEPCO, the PCO chose not to do so because "[w]e simply didn't have time" (tr. 103, 180-82). Since availability of LLTM was a common problem, the PCO was not particularly concerned (tr. 102). LLTM could sometimes be made available through the Naval supply stock system (tr. 125-26). Even if LLTM were unavailable, the Navy had the option of using something else, redesigning the affected machinery, simply canceling the work, or establishing a "split availability" (tr. 343). Since AEPCO was the only offeror that complained about LLTM, the PCO concluded that the other offerors "may have known of some sources that AEPCO didn't know of at the time" (tr. 105). The way the PCO handled the alleged LLTM problem was consistent with the way SUPSHIP Portsmouth had "handled long lead time material questions in the past" (tr. 130).

23. Even though SUPSHIP Portsmouth only extended the proposal closing date to 11 January 2000, AEPCO decided to accept that "and proceeded . . . with pricing out the material" (tr. 341-42). AEPCO's general manager testified that AEPCO recognized the risks associated with LLTM but decided to submit its proposal based on "previous experience" that such issue "was normally mitigated during the contract performance after award" (tr. 355). Winder was no stranger to RAV/TAV type procurement. He had been a planner and estimator, a production controller, a contract negotiator, and held a contracting officer position with SUPSHIP Portsmouth (tr. 332).

24. SUPSHIP's abstract of proposals shows that the PCO removed the proposals from the bid box at 9:01 a.m., 11 January 2000 (R4, tab 12; tr. 123). Of the three offers received, AEPCO was the low offeror at $1,340,242.00.[5] The other two offers were 7.3 percent and 11.6 percent higher. (R4, tab 226 at 003176; tr. 120) A pricing memorandum attached to SUPSHIP Portsmouth's business clearance shows the Navy

[5] SUPSHIP Portsmouth's business clearance used the $1,340,242.00 figure. We note AEPCO's bidding documents show a slightly higher figure—$1,340,431 (*see* finding 30, *infra*).

estimated that 18,008 manhours (MHs) would be required to perform the job order (*id.* at 003175; tr. 3250). The Navy's estimate of $897,014.96 to perform the job order was based on a labor rate of $12.36 per hour (R4, tab 226 at 003175) whereas AEPCO's proposal was based on a labor rate of $27 per hour. On the same day, the PCO awarded Job Order No. 0072 to AEPCO (R4, tab 1).

AEPCO's Proposal

25. Davis, Don Strohecker (Strohecker), AEPCO's estimating manager, and Karen S. Withers (Withers), AEPCO's purchasing manager, participated in putting together AEPCO's initial estimate (tr. 247, 295). AEPCO's bid resume shows that it estimated 20 line items of work including the four shipalts added by Amendment No. 1. Each line item estimated had two components: (1) manhours (MHs) and (2) material. The material portion of the estimate in turn had three subcomponents: (a) store (rag, bags, and tags, etc.); (b) direct material (based on vendor quotes); and (c) subcontractors. (R4, tab 508; tr. 323-24)

26. AEPCO's bid resume shows it estimated it would take 25,405 MHs to complete Job Order No. 0072, including the shipalts. It estimated store material consumption at $89,290. At a labor rate of $25 an hour, Davis and Strohecker estimated total labor costs at $635,125 ($25 x 25,405 MHs). (R4, tab 508)

27. Withers summarized her role in assembling the material costs as follows:

> A The drawings were read, the specs were read, it was entered into an Excel spreadsheet, sorted down by vendor type, faxed out to the proper vendors, the pricing as it was returned was evaluated, entered into the spreadsheet, the spreadsheet is then again sorted when they're all finished into item sequence, I total them by item, and I had then [sic] to the estimating department.

(Tr. 295) Withers acknowledged that, for the most part, she had to have drawings to do material take-offs (tr. 296). She testified when AEPCO submitted its proposal she had probably received 99.5 percent of the material quotes "in hand" (tr. 307).

28. After Davis, Strohecker[6] and Withers finished their estimates, it underwent two more levels of review. Cameron L. Potter, Jr., AEPCO's project/production manager (Potter) (tr. 245-46) conducted the first review. Potter started at Norfolk Naval Shipyard as a helper. He had over 30 years of "deck plate" experience. He had worked on

[6] Strohecker estimated "a couple of the items" and did not review Davis' estimate (R4, tab 528, Davis dep. at 37, 41).

"hydraulic systems, steam systems, anything mechanical" on ships. (Tr. 241) At SUPSHIP, he had been a ship surveyor, project manager, contract negotiator, and contracting officer (tr. 244-45, 2191-92). Potter testified he sat down with Davis and Strohecker to "go through each item," and based on his "years of experience," changed the manhours for some of the items. He testified "[s]ometimes I'd go up, sometimes I'd go down. Sometimes I don't move at all." (Tr. 248)

29. As a result of his review, Potter slashed the estimated MHs from 25,405 to 22,802 MHs, a 10.25 percent reduction. AEPCO's bid resume shows Potter slashed the MHs of 11 out of 20 line items. On the MFP shipalt, he cut the MHs from 4,000 to 3,500, a 12.5 percent reduction. On the solid waste pulper shipalt, he cut the MHs from 13,145 to 11,830, a 10 percent reduction. (R4, tab 508) In effecting his cut in MHs, Potter did not review the drawings. He explained, "The drawings don't tell me how much it would take me to do it. All the drawing does is give you a list of material required to do the drawing, to accomplish the requirements of the job." (Tr. 254) While Potter's cut might have improved AEPCO's chances of winning the contract, we find Potter assumed a risk in effecting a cut in MHs without reviewing the drawings because the total scope of work could not be determined without reviewing the drawings. As AEPCO's general manager acknowledged:

> You cannot determine the scope of work on one of these ship alts until you get the drawings because the specification for the most part in directing a ship alt refers you back to the drawings to accomplish the requirements of the drawings.

(Tr. 340)

30. Potter originally suggested an hourly rate of $25.00. General manager Winder increased the hourly rate to $27.00. AEPCO's general manager testified he believed the $25.00 rate was low, and AEPCO had to "go up to $27 for this to be a profitable effort" (tr. 346). Thus, with $615,654 (27 x 22,802 MHS) in labor costs, $566,097 in material costs and $158,680 in subcontractor costs, AEPCO submitted its $1,340,431 offer (R4, tab 508). At the time it submitted its offer, AEPCO also submitted its manning schedule and a list of subcontractors as required by L-2-31 (b) and L-2-31 (d)(1) of the solicitation (R4, tab 11). The manning schedule shows that AEPCO planned to work a single shift, five days a week, without weekends, holidays or premium time work (tr. 347-48). Since the labor schedule was prepared prior to Potter's adjustment, it did not match the MHs in AEPCO's proposal (tr. 349, 351).

31. The production schedule AEPCO submitted on 12 January 2000 did not show a PCD because "we didn't know about a PC date at this time" (tr. 1526). When he

discovered from his ship superintendent (Bill Whitehurst[7]) that SUPSHIP Portsmouth wanted the machinery space completed on 13 March 2000, AEPCO production manager Potter called ship surveyor Hunt and project manager Dale. According to Potter, "We went into overtime mode to make that PC due date, as of that date." AEPCO "[w]orked the first weekend." (Tr. 1527) We find AEPCO accelerated immediately on 13 January 2000 to try to meet the 13 March 2000 PCD.

The Requirement for P-1 Piping

32. The "REQUIREMENTS FOR FABRICATION WELDING AND INSPECTION, AND CASTING INSPECTION AND REPAIR FOR MACHINERY, PIPING, AND PRESSURE VESSELS" are set forth in NAVSEA Technical Publication S9074-AR-GIB-010/278 of 1 August 1995 (Tech. Pub. 278) (R4, tab 572). Tech. Pub. 278 defines Class P-1 piping to include:

> . . . [F]abrication welds for design pressures exceeding 300 pounds per square inch (lb/in²) or design temperatures exceeding 650 degrees Fahrenheit (°F), or both, such as steam lines, hydraulic systems, boiler generating tubes, superheater and economizer elements, other pressure retaining tubes and piping . . . and all piping systems for conveying oxygen, gasoline, and lethal gases or liquids regardless of pressure and temperature.

(R4, tab 572 at 17, ¶ 3.3.2 (b)(1)) Because of the high temperature and pressure of the water/steam they carry, defective welding of P-1 piping joints could be lethal (tr. 201).

33. The MFP shipalt specification refers to a number of drawings, among them, ¶ 2.d., "207-7289306 Rev A, S/A LCC-1285K LCC-20 HP Auxiliary Steam Mn Feed Repl HP Aux St Pp" (drawing 306), and ¶ 2.e., "208-7289307 Rev A, S/A-LCC 1285K LCC 20 Main Feed Water Mn Fd Pmp Replacement Mn Fdw Pp Modification" (drawing 307) (R4, tab 9 at GOV009430; tr. 63-64). General Note No. 9 of drawing 306 provides that:

> ALL FABRICATION AND INSPECTION SHALL BE IN ACCORDANCE WITH NAVSEA S9074-AR-GIB-010/278 FOR CLASS P-1 AND P-2. PIPE JOINT DESIGN

[7] Bill Whitehurst was AEPCO's first superintendent. He served in that position for less than two weeks, and was replaced by Jeff Parsons. (Tr. 1140-41) Whitehurst was being broken in as a ship superintendent and was apparently not ready for the job (tr. 1142).

SHALL BE IN ACCORDANCE WITH TABLE 1 AND
MIL-STD-22.

General Note No. 12 of drawing 307 provides that:

FABRICATION, WELDING AND INSPECTION FOR
CLASS P-1 & P-2 PIPING SHALL BE IN ACCORDANCE
WITH NAVSEA S9074-AR-GIB-010/278.

(R4, tab 506; tr. 191) Potter testified that the estimator would have read the notes on the drawings in preparing the original estimate. He acknowledged that if the estimator missed the notes, he would have missed them also because he did not review the drawings (tr. 254).

34. The MFP shipalt drawings contain a "LIST OF MATERIAL" required for Job Order No. 0072. They require certain P-1 piping and associated material. For example, Item No. P-2 of drawing 307 requires 40 feet of "5", 5.563" OD x .258" THK PIPE" of P-1 piping; Item F-1 requires 3 "3", ELBOW 90°" for P-1 piping; and Item No. F-12 requires 3 "3", FLANGE, 600LB. RF. WELD NECK" for P-1 piping. (R4, tab 506 at drawing 307) The fact that P-1 piping was required should alert a contractor to two more requirements: (1) the requirement for material test reports to ensure that the pipe material is capable of "withstanding the pressures and the temperature" to which the pipe would be subjected, and (2) the requirement to maintain a weld history for every joint "in the event that there's a problem and you can trace back to what's causing the problem" (tr. 2949-50). These two requirements, however, do not in and of themselves invoke radiographic testing (RT) as a means of non-destructive testing (NDT) (tr. 3258).

35. In doing material take-offs for purposes of submitting a proposal for Job No. 0072, AEPCO's purchasing manager did note that the drawing material list called for P-1 piping. She testified that the requirement for P-1 piping meant that she had to order material test reports;[8] and she did so. (Tr. 305-06)

36. According to AEPCO, on two prior TAVs that it worked on in 1998 involving the USS STUMP (DD-978) and the USS SAIPAN (LHA-2), the index to the specifications and the specifications themselves specifically referenced P-1 piping, and specifically called out the specific NDT set out in Standard Item No. 009-12 (exs. 1007, 1009; tr. 1277-81). In the case of the USS STUMP, the work item (551-60-001) was entitled "Masker Air Piping; replace (P-1 Piping)," and ¶ 3.3.1 of the work item provided "Accomplish non-destructive testing in accordance with Lines 10 and 12" (ex. 1007). In the case of the USS SAIPAN, the work item (534-11-001) is entitled "Auxiliary Exhaust Steam Relief Valve Drain Piping; replace (P-1 Piping)" and ¶ 3.3.1 of the work item

[8] In contrast, P-2 and P-3 class piping do not require material test reports (tr. 305).

provided "Accomplish non-destructive testing in accordance with Line 13 of table one" (ex. 1009). Based on his experience, the Navy's expert, Thomas J. Cummings (Cummings) testified "Having written and read other P-1 specifications myself, I can say that has not been typical, especially when the specification includes various pipe classifications (as does this one)" (ex. 2002 at 20, A120). Weighing the evidence before us, we find there is no trade practice in the ship repair industry of highlighting or underscoring a P-1 piping requirement in specifications.

The Requirement for RT

37. Davis testified that he knew P-1 piping was required and AEPCO was to install the P-1 piping in accordance with Standard Item No. 009-12. Based on Standard Item No. 009-12, Table 1, line 10, apparently, he concluded only a visual inspection of the P-1 piping was required. He testified that had he known that radiographic testing of the weld joints was required, he would have included in AEPCO's estimate the cost of a radiographic testing subcontractor and additional "QA hours." (R4, tab 528, Davis dep. at 51, 53) There is no evidence that either Davis or Strohecker relied on the fact that SUPSHIP Portsmouth had highlighted or underscored NDT requirements in the past in deciding not to include RT in their estimates. Neither Davis nor Strohecker testified at the hearing. We find that they did not pick up the RT requirement because they failed to read the drawings thoroughly.

38. Inasmuch as the purpose of the MFPs was to send high pressure/high temperature water into the boiler to create steam, P-1 piping welds require some kind of NDT (tr. 1558-60). According to NAVSEA Technical Publication Requirements for Nondestructive Testing Methods, T9074-AS-GIB-010/271 (Tech. Pub. 271), there are six NDT methods: (1) Visual Testing (VT); (2) Magnetic Particle Testing (MT); (3) Liquid Penetrant Testing (PT); (4) Ultrasonic Testing (UT); (5) Eddy Current Testing; and (6) Radiographic Testing (RT) (R4, tab 556, Villorente aff., ¶ 2).

39. AEPCO had no in-house RT capability. To the extent RT was required, AEPCO would subcontract that work to Scientific Technical, Inc. (Si-Tech) or Advex Corporation. (Tr. 185-86, 190, 352)

40. The MFP shipalt specification does not reference the need for RT directly. Paragraph 2.a. of the specification refers to "Standard Items."[9] Paragraph 2.d. of the

[9] Standard Items are effectively "spec items in their own right" (tr. 3135). Job Order No. 0072 listed 102 Standard Items, and provided that all except those struck out in the index would apply without further reference (R4, tab 2 at ACO06468-74). The full texts of all the Standard Items are included under R4, tab 574. Those struck out in the index and therefore not applicable to Job Order No. 0072

specification refers to drawing 306, and paragraph 2.e. of the specification refers to drawing 307. (R4, tab 9 at GOV009430)

41. Paragraph 3 of the MFP shipalt specification is entitled "REQUIREMENTS." Paragraph 3.2 provides:

> Accomplish the requirements of 009-12 of 2.a, including *Table One, Columns A and B, Lines One through 10* and Table 2, Columns A, C and D Lines One through 7.

(R4, tab 9 at GOV009431-32) (Emphasis added)

42. The requirements of 009-12 referred to above have to do with a document entitled "NAVSEA STANDARD ITEM" dated 6 November 1998. This document pertains to "Welding, Fabrication, and Inspection Requirements." (R4, tab 213) Table 2 of NAVSEA STANDARD ITEM deals with welding, fabrication and inspection of surface ship hulls (combatant) and is therefore not pertinent here (R4, tab 213 at 020311; tr. 193-94).

43. Table 1 of Standard Item 009-12 is entitled "WELDING, FABRICATION, AND INSPECTION OF PIPING, PRESSURE VESSELS, PROPELLERS, AND MACHINERY." Table 1, Column A pertains to "CLASS P-1, P-2 AND P-LT PIPING." Table 1, Column B pertains to "CLASS P-3A AND P-3B PIPING." Line 1 pertains to "WELDER AND BRAZER QUALIFICATION," Line 2 to "WELDING PROCEDURE," Line 3 to "BRAZING PROCEDURE," Line 4 to "WELDING REQUIREMENTS," Line 5 to "FILLER MATERIAL," Line 6 to "JOINT DESIGN," line 7 to "HEAT TREATMENT," Line 8 to "WORKMANSHIP REQUIREMENTS," Line 9 to "VISUAL INSPECT JOINT FIT-UP," Line 10 to "VISUAL INSPECTION," Line 11 to "RADIOGRAPHIC INSPECTION (RT)," Line 12 to "ULTRASONIC INSPECTION (UT)," Line 13 to "LIQUID PENETRANT INSPECTION (PT)," and Line 14 to "MAGNETIC PARTICLE INSPECTION (MT)." (R4, tab 213 at 020307-08)

44. Davis testified that there was no ambiguity about what was required for the MFP piping: AEPCO was to accomplish the requirements of Standard Item No. 009-12, TABLE 1, COLUMNS A and B, Lines 1 through 10 (R4, tab 528, Davis dep. at 34, 37). AEPCO takes the position in these appeals that since the MFP shipalt specification refers only to Table 1, Columns A and B, Lines 1 through 10, and not to Lines 11 to 14, there is no requirement to perform RT (Line 11) (tr. 194-95).

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included 009-02, -08, -18, -34, -35, -70, -72, -79, -99, -100, and -101 (*see* R4, tab 2 at ACO06468-70).

45. As noted previously, the MFP shipalt specification referred to and the bidding documents included drawing 306 and drawing 307. General Note No. 9 of drawing 306 requires that "ALL FABRICATION AND INSPECTION SHALL BE IN ACCORDANCE WITH NAVSEA S9074-AR-GIB-010/278 FOR CLASS P-1 AND P-2." Moreover, General Note No. 12 of drawing 307 requires that "FABRICATION, WELDING AND INSPECTION FOR CLASS P-1 . . . PIPING SHALL BE IN ACCORDANCE WITH NAVSEA S9074-AR-GIB-010/278" (*see* finding 33). Paragraph 10 of Tech. Pub. 278 set out "INSPECTION REQUIREMENTS." TABLE IX, pertaining to "Class P piping inspection requirements" provides, in part, as follows:

TABLE IX. Class P piping inspection requirements. 1/ 2/

Piping class	Welded joint type	Pipe size, inches nps	Required examinations and tests						
			VT 18/		MT/PT test 17/		RT		Pressure
			Root layer	Final weld 16/	Root layer	Final weld 5/	Final weld 3/	Extent 15/	11/
Lethal or gasoline	Butt	All	-	X	X 4/	X	X	360 deg.	X
P-1 and P-LT 12/	Butt	>3-1/2	-	X	X 4/	X	X 13/	360 deg.	X
		2-1/2 to 3-1/2 inclusive	-	X	X 4/	X	X 6/ 7/ 13/	60 deg. min.	X
		<2-1/2	-	X	X 4/	X	X 6/ 7/ 8/ 9/ 13/	60 deg. min.	X

(R4, tab 572 at 88) Note 1 to TABLE IX provides "This table does not apply to piping used in components or accessories covered in sections 13, 14, and 15, which specifically list inspection requirements" (*id.* at 89). Section 13 applies to "REPAIR OF CASTINGS" (*id.* at 121), Section 14 to "NDT REQUIREMENTS FOR TURBINE PARTS" (*id.* at 127), and Section 15 to "NDT INSPECTION REQUIREMENTS FOR PROPULSION REDUCTION GEARS AND STEAM TURBINE DRIVEN AUXILIARY GEARS" (*id.* at 130). AEPCO has not argued, and we find, Note 1 does not exempt or render inapplicable the RT requirements of TABLE IX. Nor does Note 2 of TABLE IX which provides "Where new welds in piping intersect existing or older welds, the latter welds shall be inspected for a distance of 6 inches or a distance equal to 50 percent of the pipe size diameter . . ." (R4, tab 572 at 89).

46. We find this table requires all final butt welds of P-1 piping exceeding 3 ½ inches to undergo 360º RT, and all final butt welds of P-1 piping up to 3 ½ inches to undergo a minimum of 60º RT.

47. AEPCO argues that since there is a conflict between Standard Item No. 009-12, Table 1 and TABLE IX of Tech. Pub. 278, paragraph 1.7, "Document precedence" of Tech. Pub. 278 would resolve the conflict in its favor. Paragraph 1.7 provides:

> Unless otherwise specified herein, in the event of conflict between this document and other documents, the following order of precedence shall apply:
>
> (a) Ship specifications for a particular ship or class, or Deep Diving General Overhaul Ship Specifications (DDGOSS), as appropriate (*this includes plans and drawings).*
>
> (b) Equipment or component specifications.
>
> (c) This document.
>
> (d) Other referenced documents.

(R4, tab 572 at 1) (Emphasis added)

48. We find no conflict between ¶ 3.2 of the MFP shipalt specification requiring accomplishment of Standard Item No. 009-12, Table 1, Column A, Lines 1 through 10 and Tech. Pub. 278, TABLE IX. Paragraph 3.2 does not include RT but neither does it exclude RT, whereas Tech. Pub. 278, TABLE IX specifically requires RT.

49. According to Potter, had he known that P-1 pipe joints would have to be subjected to RT, AEPCO's price on the MFP replacement shipalt "would have at least doubled" (tr. 1536).

Discovery of the RT Requirement and Issuance of Sequence No. 23G

50. The one-liner for 15 to 17 January 2000 reported rip out of the existing MFPs was 90 percent complete. The report noted that replacement of the lube oil purifier was to be cancelled due to a problem relating to LLTM. (R4, tab 103 at 000508) On 18 January 2000, SUPSHIP Portsmouth issued a stop work order on the lube oil purifier (*id.* at 000509). On 19 January 2000, AEPCO completed removal of the MFP piping (*id.* at 000510). The one-liner for the 22-23 January 2000 weekend reported that AEPCO

was beginning to remove the three existing MFPs and production was on track (*id.* at 000512).

51. During the next few days, from 24 to 27 January 2000, AEPCO continued to remove the MFPs, and was fabricating the foundations for the three new MFPs (R4, tab 103 at 000513-16). On Saturday, 29 January 2000, it was discovered that the new MFPs could not enter the vessel without making an access cut (*id.* at 000517). By 31 January 2000, the access cut had been made. In the meantime, AEPCO was still working on the MFP foundations (*id.* at 000519). By 1 February 2000, roughly two-and a-half weeks into the project, the new MFPs had been moved into the ship's machinery space; the MFP foundations had been welded in place; and AEPCO was in the process of painting the foundations (*id.* at 000520).

52. While AEPCO was able to rip out the old MFPs and to put the new MFPs in place relatively quickly, SUPSHIP Portsmouth was concerned that AEPCO did not have enough manning once piping work began. SUPSHIP Portsmouth made known to AEPCO its concern the second week into the project. (Tr. 1171-73) Because of the magnitude of the work, SUPSHIP Portsmouth had suggested that AEPCO use three teams to work on the three MFPs (designated as A, B and C) simultaneously (tr. 1117, 1194).

53. The one-liner of 3 February 2000 indicated that "MAIN FEED PUMPS ARE BEING HARD PIPED" (R4, tab 103 at 000521). This means piping was being connected (or welded) to the MFPs (tr. 935).

54. Carl William Brusso, II (Brusso) was AEPCO's quality assurance (QA) manager (tr. 444). It was his responsibility to develop a test inspection (TI) plan for Job Order No. 0072. The TI plan was a part of AEPCO's QA system that was required by Standard Item No. 009-04. (Tr. 445-46) Brusso did not receive the contract drawings until about a week or 10 days after award (tr. 489, 520-21). He testified he was alerted to the presence of P-1 piping by the specification alone because of the high-pressure requirement of ¶ 3.6 of the MFP shipalt specification (tr. 450; *see* R4, tab 9 at GOV009432, ¶¶ 3.6.1, 3.6.2). Brusso consulted with AEPCO's welding consultant, Jerry Brown (Brown). Brown had worked for Norfolk Shipbuilding and Drydock Corporation (NORSHIPCO) and SUPSHIP for 35 years, and was considered SUPSHIP's "ace or guru" on welding. (Tr. 450) After reviewing Tech. Pub. 278, Brusso was told that "butt weld piping in P1 systems requires certain RT requirements and that was in 278" (tr. 456-57). After determining RT was a requirement, Brusso went to Potter (tr. 458).

55. By letter dated 9 February 2000, Potter advised SUPSHIP Portsmouth by way of Condition Report 063:

> 1. The specification item does not reference any P-1 requirements. The material list of Reference 2.e. item number P-2, list P-1 piping.
>
> 2. Paragraph 3.2 of the specification item lists the requirements for welding and testing. There is no requirement to perform any radiographic inspections. General note 12 of reference 2.e. requires all welding and inspection to be accomplished in accordance with NAVSEA S9074-AR-GIB-010/278. This requires all piping over 2 ½ inches to be inspected by RT.
>
> 3. The contractor understands that the specification takes precedent [sic] over the drawings however, we feel that this is an ambiguous specification item. AEPCO bid to accomplish the requirements as stated in paragraph 3.2. of the specification item.

AEPCO's letter made the following recommendations:

> 1-2. Contractor request clarification of ambiguities between referenced drawings and the specifications.
>
> 3. The contractor request compensation for complying with any P-1 or other requirements that are not identified in the specification items (RT).

(R4, tab 107, Report 063)

56. By letter dated 8 February 2000, Brusso sought SUPSHIP Portsmouth's approval to use the Standard Welding Instruction (SWI# P0101TWS) to accomplish welding of P-1 piping (tr. 448; R4, tab 107, Report 055).

57. On 11 February 2000, ship surveyor Hunt mistakenly advised AEPCO that there was "no P-1 piping on the MFP" (R4, tab 236 at 010042; tr. 1533). On 12 February 2000, AEPCO was notified that SUPSHIP Portsmouth "wanted to do S.I. 009-012 TABLE I COLUMN A LINES 1 THRU 14" (R4, tab 236 at 010042; tr. 1534). Immediately after this verbal notification, AEPCO increased its manning and engaged a subcontractor to perform RT of the MFP weld joints (tr. 1534). According to Potter, AEPCO increased its manning from working 10 hours a day, 7 days a week (since 13 January 2000 to meet the 13 March 2000 PCD) to working 12 hours a day, 7 days a week, beginning 12 February 2000 (tr. 1535).

58. In response to Condition Report 063, on 14 February 2000, ship surveyor Hunt issued Sequence No. 23G which added the following to the MFP shipalt specification:

> 3.2.1. FOR NDT REQUIREMENTS, ACCOMPLISH LINES ELEVEN AND 14, FOR WORKMANSHIP PERFORMED UNDER TABLE ONE.

(R4, tab 239; tr. 459-60) According to AEPCO's expert, adding RT for the MFP P-1 piping "changed the entire complexion of the project and the endeavor was materially adversely impacted from that day forward" (tr. 2621). ACO Stroud assumed Sequence No. 23G was valid at the time, although he has since changed his mind[10] (tr. 1469-70). We find at the time ship surveyor Hunt issued Sequence No. 23G, ACO Stroud did not know that the contract already designated RT as the NDT method for the MFP P-1 piping.

59. As reflected in our findings in our summary judgment decision, ACO Stroud apparently did not know that RT was a contract requirement as late as July 2000. The evidence shows that he and Potter negotiated a settlement of $59,000 for Sequence No. 23G, along with 25 other sequences in July 2000. Before their settlement could be implemented by way of contract modification, however, AEPCO altered the settlement sheets and added language reserving its right to claim delay, disruption and loss of efficiency. As a consequence, the 26 sequences tentatively settled in July 2000 were never finalized by way of modification. (*See AEPCO*, 03-1 BCA at 158,986-87, ¶¶ 22, 28, 29, 31)

60. The one-liner for 14 February 2000 indicated that "FEEDPUMP SOCKET WELDING IS IN PROCESS; START OF PCP [Process Control Procedure] IS IN PROCESS FOR BUTT JOINTS" (R4, tab 103 at 000528).

61. AEPCO could have continued with pipe installation begun on 3 February 2000 (finding 53). According to its 12 January 2000 bar chart schedule, this phase of the MFP replacement work was to be completed on 7 March 2000 (R4, tab 105 at 1). Because of the uncertainties surrounding the welding and inspection of P-1 piping, AEPCO did not begin to butt weld the P-1 joints until 22 February 2000 (R4, tab 103 at 000533; tr. 1109). We find this 3-week delay caused AEPCO to have to accelerate to catch up.

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[10] ACO Stroud's role in connection with Job Order No. 0072 appears to be somewhat limited. He acknowledged that he was not on the deck plate. He testified when he received the sequences, he simply negotiated them. (Tr. 2349-50)

62. The one-liner for 23 February 2000 reported that "MAIN FEED PUMP PIPING IN PROGRESS; KTR IS WORKING 12HRS/DAY AND SEEKING ADD'L TIG WELDERS TO MAINTAIN PRODUCTION SCHEDULE"[11] (R4, tab 103 at 000534). Project manager Dale testified SUPSHIP Portsmouth did not direct AEPCO to increase its manning to the 12-hour per day shift, and AEPCO voluntarily did so because it needed "to keep up or maintain the schedule" (tr. 1110-11, 1121).

63. On 28 February 2000, SUPSHIP Portsmouth advised SURFLANT by e-mail:

> 5. SUPSHIP PORTSMOUTH: MAIN FEED PUMP PROGRESS WAS DISCUSSED WITH AEPCO REP. CONTRACTOR HAS INCREASED DAILY WORK HOURS FROM 10 TO 12 HOURS, SEVEN DAYS A WEEK.

(R4, tab 141 at 001057; tr. 1349) SURFLANT replied by e-mail on the same day:

> 13 March is approaching fast. What is AEPCO's plan to support SF's light off preparation plans on this date? Will an additional 2 hours a day get us there?
>
> Should we [be] concerned for any of the other work in the package? Up to now every thing has been "rosey."

(R4, tab 141 at 001056)

64. On 28 February 2000, AEPCO general manager Winder was summoned to meet with SUPSHIP representatives (tr. 374-75). The meeting was called to discuss timely completion of the MFP replacement. AEPCO was directed to "review, modify, and submit an accurate production schedule that would allow the project team to evaluate daily, the percentage and numbers of pipe joints being welded each day." (R4, tab 145; tr. 375) Winder was asked to attend morning production meetings to report on the

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[11] Shield metal arc welding (SMAW) or "stick welding" and gas tungsten arc welding (GTAW) or "TIG welding" are different welding processes. A welder needs to be qualified in each process. Generally, "stick welding" uses a large quantity of metal, takes more time to clean up, and is more tedious. "TIG welding" is used for welding smaller items, and requires a higher level of skill. (Tr. 461-62) AEPCO originally wanted to "stick weld" all the butt joints. Because of a high rate of burn-through, it decided to switch to TIG welding. (Tr. 1154-56) There was "a lot of work on the waterfront" at the time, and qualified welders were in demand and were "hard to come by" (tr. 1157, 1177).

progress on pipe joint welding (tr. 375-76). Immediately after this meeting, AEPCO went to two 12-hour shifts,[12] working around the clock (tr. 382-83, 1539).

65. The one-liner for 28 February 2000 contained the following note:

> KTR MET WITH SUPSHIP'S C-420 & C-605 PERSONNEL TODAY WITH A PLAN TO RECOUPERATE LOST PRODUCTION SCHEDULE IMPACT OF THE MAIN FEED PUMPS BY INCREASING THE NUMBER OF PIPEFITTERS/WELDERS ON TWO 12hr/DAY SHIFTS, AND TRACKING THE NUMBER OF WELD JOINTS THAT HAVE COMPLETED WELDING AND NDT!

(R4, tab 103 at 000537)

66. SURFLANT's 29 February 2000 e-mail to SUPSHIP Portsmouth commented:

> . . . ITS [sic] SEEMS TO ME THAT A ROUND THE CLOCK EFFORT 7 DAYS A WEEK IS REQUIRED IF WE ARE TO SUPPORT LITE-OFF. REQUEST COMMENTS ON AEPCO ABILITY TO COMPLETE AS PRESENTLY PLANNED. SLIPPAGE OF DATE IS NOT AN OPTION.

(R4, tab 141 at 001060)

67. The one-liner for 29 February 2000 indicated "THE NEW PLAN IS BEING IMPLEMENTED STARTING FIRST SHIFT TODAY" (R4, tab 103 at 000538). Even though AEPCO was working two 12-hour shifts each day, not all of the time could be devoted to welding pipes because it had to shut down each night for RT (tr. 1018, 1834). Moreover, it became problematic for AEPCO when it went to the two 12-hour shifts because it did not have enough qualified welders to fill the two 12-hour shifts (tr. 1792). According to AEPCO's Welder Qualification record, as of 28 February (and 2 March) 2000, it only had three welders qualified to do TIG welding (R4, tab 245 at 1, 8; tr. 1587-89). At that time, the Tidewater area was extremely busy and there was a shortage of qualified welders for hire (tr. 1833). Also around this time, general manager Winder began attending SUPSHIP Portsmouth's 8 a.m. morning production meetings to provide a count of how many joints were completed and how many joints passed RT (tr. 1006).

68. The one-liner for 1 March 2000 reported: "PRODUCTION WELDING OF MAINFEED PUMP PIPING IS ON TRACK IAW KTR'S PLAN; APPROXIMATELY

[12] There was not enough available labor to man the vessel with three 8-hour shifts (tr. 383).

32 VARIOUS SIZE JOINTS HAVE BEEN WELDED IN 24 HRS" (R4, tab 103 at 000539). AEPCO continued to weld pipes and conduct NDT until 7 March 2000. It was reported "FUEL LINE RUPTURE HAS STOPPED HOTWORK IN FIREROOM." (R4, tab 103 at 000542) Between 8 and 16 March 2000, AEPCO continued to work around the clock fitting, welding, and repairing joints. NORSHIPCO began repairing the ruptured fuel line on 15 March 2000 and completing it on 16 March 2000. (R4, tab 103 at 000543-49) By 19 March 2000, AEPCO had completed 93 percent of the joints (R4, tab 103 at 000550).

Results of Radiographic Testing

69. In order to perform various types of NDT and to be qualified to interpret the results of tests, one has to be certified for each type of testing. Private testing firm employees are qualified by American Society of NonDestructive Testing (ASNT) or equivalent entities. (Tr. 690) NAVSEA has its own NDT certification program under Tech. Pub. 271, entitled "REQUIREMENTS FOR NONDESTRUCTIVE TESTING METHODS" (R4, tab 573). NAVSEA's NDT Personnel Certification Activity is located at the Portsmouth Naval Shipyard in New Hampshire (tr. 690).

70. Tech. Pub. 271, ¶ 1.6, "Nondestructive test personnel certification," provides "[p]ersonnel performing nondestructive testing shall be certified in accordance with the guidelines of ASNT SNT-TC-1A" (R4, tab 573). Under Tech. Pub. 271, a NDT test examiner is equivalent to Level III in ASNT SNT-TC-1A (*id*., ¶ 1.5.5); a NDT test inspector is equivalent to Level II in ANST-SNT-TC-1A (*id.*, ¶ 1.5.7); and a NDT test operator is equivalent to Level I in ASNT-SNT-TC-1A (*id.*, ¶ 1.5.6). Under Tech. Pub. 271, a Level III examiner "is the individual to whom the activity assigns the responsibility of approving nondestructive test procedures and workmanship standards" (*id.*, ¶ 1.5.5). Upon certification, both a Level III examiner and a Level II inspector can interpret RT films. A Level III examiner is not necessarily a better interpreter. His interpretation is not accorded more weight by virtue of the level he has achieved.

71. Four people were principally involved in interpreting RT films for the MFP P-1 piping: for NAVSEA, it was Alfonso B. Villorente (Villorente) and Daniel B. Lovingood (Lovingood). Villorente was certified as a Level II inspector in RT under the Navy program pursuant to NAVSEA Tech. Pub. 271. He worked for SUPSHIP Portsmouth. (R4, tab 556, ¶¶ 1, 6) Lovingood was certified as a Level III examiner in RT under the same Navy program. He worked for SUPSHIP Newport News. (R4, tab 557, ¶¶ 1, 5) R. Harrington (Harrington) worked for Si-Tech and was assigned to the MT. WHITNEY. He was a Level II RT inspector. Bobby Dennis (Dennis), president of Si-Tech, was a Level III RT examiner (R4, tab 556, ¶ 20).

72. The parties disagree whether RT film reading is an art involving mainly subjective interpretation by a qualified inspector or examiner, or whether it is more of a

science. Tech. Pub. 278, TABLE XI, "Acceptance standards and classes," shows that for Class P-1 weld application, the standards specified in MIL-STD-2035 would apply for RT (R4, tab 572 at Original 96; tr. 694). Paragraph 5 of MIL-STD-2035A(SH), 15 May 1995, "NONDESTRUCTIVE TESTING ACCEPTANCE CRITERIA," defines the acceptance standards for RT including, for example, "Burn through, melt through and crater pit" (¶ 5.2.1.2); "Porosity" (¶ 5.2.1.6); and "Clustered porosity" (¶ 5.2.1.6.5) (R4, tab 571 at 10-12).

73. Lovingood testified interpreting RT films is "designed to be repeatable. That's why we go through a certification process. If it was not repeatable from one interpreter to the next, it wouldn't be considered a science." (Tr. 721) He acknowledged that inasmuch as the films have "so many different shades of gray . . . deciding . . . where to start measuring and where to stop measuring" could involve some subjectivity (tr. 730). We note that MIL-STD-2035A(SH) provides that "[f]or welds 1/8 inch thick and greater, porosity indications 1/64 inch or less in diameter shall not be counted in evaluation of weld quality" (R4, tab 571 at 11, ¶ 5.2.1.6.1). For randomly dispersed porosity, pictorial presentation of the acceptance criteria for welds of various classes and base metal thickness are shown in MIL-STD-2035A(SH) (*id.*, ¶ 5.2.1.6.2). Similarly, ¶ 5.2.1.6.5 defined clustered porosity as follows:

> Porosity shall be classed as clustered when a group of four or more indications are concentrated in a manner as shown on figure 24. Pores separated from the group by 1/8 inch or 3D, (where D is the diameter of the largest pore in the group), whichever is greater, shall not be considered a part of the group.

(R4, tab 571 at 12) In reviewing MIL-STD-2035A(SH), we find that the acceptance criteria set forth therein are "quantifiable," and "measurable" (tr. 698-99), and are therefore more objective than, as AEPCO contends, subjective.

74. Si-Tech began RT of the P-1 welds on or about 7 March 2000 (tr. 560). On 16 March 2000, Villorente was called into a meeting in the QA Department at which he was asked to search his database for contractors who could do P-1 piping work. Villorente recommended NORSHIPCO, and three other firms. (R4, tab 556, ¶ 18; tr. 561)

75. On 17 March 2000, Villorente was asked to review the RT films taken on the MT. WHITNEY (R4, tab 556, ¶ 19). Villorente obtained the RT films from AEPCO's QA manager when he went to the vessel on 18 March 2000 (*id.*, ¶¶ 21, 22). In reviewing the films, Villorente found "[w]hereas SI-TECH found certain weld joints acceptable, I found them rejectable" (*id.*, ¶ 23). Of the films he examined on 18 March 2000,

Villorente found four joints[13] out of the 12 rejectable (tr. 1653). Later that night, Villorente received more films covering 18 joints. He rejected nine of those joints. (Tr. 1654)

76. Villorente testified that he found rejectable some of the welds Si-Tech accepted because of "discontinuities" (tr. 566). He also found other accepted welds rejectable because of porosity—the holes measured from 1/32 to 1/16 of an inch, or were too many and too large (clustered porosity) (tr. 568). In coming to his conclusion, Villorente applied the acceptance criteria set out in MIL-STD-2035A(SH) (tr. 569, 698). Harrington, Si-Tech's Level II inspector did not testify. There is no evidence whether he applied the criteria in MIL-STD-2035A(SH) in accepting the joints Villorente rejected. According to Villorente, Dennis came out to the MT. WHITNEY, and he interpreted "a discontinuity . . . [as] actually a weld on a backing ring not part of the Butt Joint weld . . . and therefore, acceptable" (R4, tab 556, ¶ 25).

77. On 19 March 2000, Villorente reported his findings to Bobby J. Kilpatrick (Kilpatrick), Deputy Repair Officer, Repair Department, SUPSHIP Portsmouth (tr. 1319). Kilpatrick asked what would SUPSHIP do in such a situation. Villorente suggested that another interpreter could be called in for "an independent review." (R4, tab 556, ¶ 27; tr. 1655) Villorente contacted Lovingood of SUPSHIP Newport News who came to the SUPSHIP Portsmouth Field Office at the Navy Operating Base (NOB) to review the film (R4, tab 557, ¶ 14). According to Lovingood, after conducting his own review, he "essentially made conclusions identical with those of Mr. Villorente. I found approximately fifty-percent rejections of the radiographic film, which to me seemed very high" (*id.*, ¶ 15). By 20 March 2000, SUPSHIP Portsmouth had determined that of the 52 joints Si-Tech had accepted, 14 should have been rejected[14] (R4, tabs 549 at 6-7). At about this time, AEPCO had completed all but two of the welds that required RT, and had one weld on which to perform RT (tr. 1566).

78. At a meeting held on 20 March 2000, it was decided that SUPSHIP Portsmouth "would perform a 100% inspection of all remaining x-rays taken of the P-1 Butt Joint welds" (R4, tab 556, ¶ 30). On the same day, Villorente, Lovingood and Dennis met at SUPSHIP Newport News to review the films again (*id.*, ¶ 32). Upon reviewing the 14 joints SUPSHIP rejected, Dennis agreed that 11 of the 14 should have been rejected. He believed MFV-035 and MFV-024 should be accepted and MFV-049 should be re-shot (R4, tab 551; tr. 656-62). According to Lovingood, there were "some

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[13] Of the four joints rejected, two, 1A/MF-049 and 1A/MF-052, were reworked (tr. 1653).

[14] The 14 joints that SUPSHIP Portsmouth determined should have been rejected were MFV-001, MFV-002, MFV-006, MFV-024, MFV-031, MFV-038, MFV-040, MFV-043, MFV-049, MFV-050, MFV-035, MFV-037, MFV-053, and MFV-054 (R4, tab 549 at 6-7).

difference[s] of opinions about what to call certain indications," but once the parties worked those out, Dennis agreed with the ones that should have been rejected (tr. 663). Lovingood also testified Dennis admitted that he pretty much agreed with NAVSEA's findings and that his interpreter (Harrington) was "under a lot of pressure from the contractor due to the short time frame" (tr. 659).

79. Evidence in the record shows that of the 14 joints rejected on 20 March 2000, 10 were rejected because of porosity or clustered porosity, one for linear indication, and one for incomplete fusion (R4, tab 261; tr. 614-16). One of the joints SUPSHIP Portsmouth originally rejected on 20 March 2000 was later accepted after it passed ultrasound testing (tr. 1682).

80. An internal NAVSEA e-mail dated 20 March 2000 indicated that as a result of the high rejection rate, SUPSHIP Portsmouth had lost confidence in AEPCO's ability to rework the joints in a timely fashion (R4, tab 143 at 001106). SUPSHIP Portsmouth considered a number of options, including terminating the job order for default or for convenience, before settling on what it considered to be the "best alternative" to get AEPCO to "subcontract this work out to someone else" (tr. 1404).

81. Confirming a conversation held on 20 March 2000, SUPSHIP Portsmouth by letter dated 21 March 2000 (signed by Deputy CO R. W. Ydoyaga) informed AEPCO that "[d]ue to the high failure rate of these joints, SUPSHIP Portsmouth will be required to perform a 100% inspection of all remaining joints." The letter went on to say:

> . . . Since it is unknown as to the full extend [sic] of welding failure on the balance of these joints, this command and the Captain of the vessel no longer has a level of confidence in your firm's ability to rework these joints. As a consequence and as discussed, you are directed to pursue correction of rejected joints through either Earl Industries or Norfolk Shipbuilding and Drydock Corporation. This subcontracted effort should include, if necessary, the grinding out, refitting, rewelding, and radiographic testing (RT) of the effected [sic] joint including quality assurance and deck plate management.

The letter directed AEPCO to commence RT of seven specific joints the same evening and told AEPCO that SUPSHIP Portsmouth "does not authorize any change in the agreement, the expenditures of funds, nor the extension of delivery dates beyond those stated in the applicable job order." (R4, tab 146; tr. 399)

82. Captain Jenkins testified that inasmuch as "AEPCO still could not provide management controls, PERT charts, program charts, couldn't tell where we were and

when we were going to get there," he held the view that "as long as they're hiring other people, maybe we ought to go with a different management" (tr. 1854).

83. AEPCO sent the RT films to Munson NDT Consultants for further review. After his review, David L. Spooner, a Level III NDT examiner, advised AEPCO that "[i]n general, I concurred with Si-Tech Testing Labs Incorporated original interpretation results" (R4, tab 283 at 002956). According to general manager Winder, Spooner "agreed with some of the rejected welds, did not agree with the majority of the rejected welds" (tr. 398).

84. Pursuant to SUPSHIP Portsmouth's direction, AEPCO issued P.O. No. DV00-1431 to NORSHIPCO for temporary certified welders and marine pipefitters to correct the rejected MFP weld joints (R4, tab 537). In performing its work, NORSHIPCO had its own QA inspectors, and created its own weld history data.[15] Si-Tech continued to perform RT on the joints welded by NORSHIPCO (R4, tab 290; tr. 476-77).

85. Even though NORSHIPCO was assigned to repair 14 joints, it actually worked on 25 joints because it chose to take some joints out and bend some pipes (tr. 508, 1266-67). "It was easier for them to take out and refit up a whole section of piping and even destroy some acceptable welds then [sic] to fix the ones that were . . . unacceptable" (tr. 508-09). Instead of strictly welding onboard ship, NORSHIPCO welded some joints in its shop (tr. 522). Moreover, in addition to backing rings, NORSHIPCO also used electric boat or EB rings (tr. 1262).

86. The joints welded by NORSHIPCO had a higher rejection rate (tr. 404). The welders NORSHIPCO sent to MT. WHITNEY were "the cream of the crop" (tr. 1236). The areas of the pipes to be repaired were marked by overlays by either AEPCO's QA or Si-Tech (tr. 1237, 1247). The working area in the vicinity of the MFP was described as "[v]ery congested" (tr. 1240). William Pate, NORSHIPCO's production manager attributed the high rejection rate to the less than ideal working conditions in the MFP area. He testified that the locations of some of the joints were very difficult: welders were standing on ladders welding in the overhead using a mirror for assistance; the deck plate would move when people walked by; and there were three or four people grinding and welding in the same general location (tr. 1242). The welds that failed multiple rounds of inspection were those located in tight spaces where it was difficult for a welder to do his work (tr. 514-15). The MFPs were in "one corner of the engine room. . . . [they] were so close together that one of them you couldn't even walk between it. It had a huge rat's nest of piping on top of it." (Tr. 2617)

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[15] Because of the criticality of P-1 piping weld joints, a contractor is required to keep a weld joint history for each P-1 weld joint. It sets forth the history of fabrication, welding and NDT of that weld joint. (Tr. 467-70; *see* R4, tabs 288, 290)

87. We find the tight spaces around the MFPs where AEPCO had to do work were discernible at the time it ship checked the vessel. We find the higher than normal rejection rate was attributable inherently to the tight conditions in the spaces in the MFP area where AEPCO had to work, and not to AEPCO's inability to rework or correct rejected welds. We find given the same circumstances and opportunity, AEPCO could have reworked and corrected the defective welds found in time for sea trials.

88. After NORSHIPCO completed welding on 24 March 2000, SUPSHIP Portsmouth rejected four out of the eight joints (50%) inspected. On 26 March 2000, SUPSHIP rejected 4 out of 12 joints (33%) inspected. On 27 March 2000, SUPSHIP rejected three out of the five joints (60%) inspected. Later the same day, SUPSHIP Portsmouth rejected four out of the four joints (100%) inspected. (R4, tab 556, ¶¶ 41, 43, 47, 48; tr. 601-03, 1664) In all cases, Si-Tech agreed with SUPSHIP Portsmouth's interpretation.[16] The rejected joints were repaired. By the time the MT. WHITNEY went to sea, all joints were accepted. (Tr. 631)

89. On 10 April 2000, NORSHIPCO sent AEPCO Invoice No. 4194-01 for providing "certified welders and marine pipefitters to work for AEPCO, Inc. onboard the USS Mt. Whitney during the period of 03/11/00 – 03/29/00." The amount invoiced was $38,299.81. (R4, tab 546) Documentary evidence in the record shows AEPCO paid the invoiced amount by Check No. 4355 on 16 May 2000 (R4, tab 547). A breakdown record shows NORSHIPCO personnel worked 731.25 actual hours (including straight, overtime, and travel hours) between 11 and 29 March 2000 repairing and completing the P-1 welding on the vessel (R4, tab 548).

90. By letter dated 21 April 2000 to Si-Tech, SUPSHIP Portsmouth formally suspended Harrington from interpreting films on Navy contracts on the ground that he was "unable to competently perform RT film interpretation" (R4, tab 148; tr. 620-21). Based on all of the evidence in the record, we find that Harrington should not have accepted some of the joints ultimately rejected by SUPSHIP Portsmouth.

91. The normal weld rejection rate is between 5 to 10 percent (tr. 679). AEPCO alleges that the high rate of rejection of its welds was the result of Villorente's overly strict interpretation (tr. 395). AEPCO also suggests that given the subjective nature of film interpretation, the fact that Lovingood's interpretation agreed totally with Villorente's was highly unusual.

92. Even though Villorente acknowledged that he was a "strict grader," he testified that SUPSHIP had acceptance criteria to go by and he had to "stick with that acceptance criteria" (tr. 597). The evidence shows in reviewing the RT films,

[16] Si-Tech performed RT on MT. WHITNEY from 7 to 28 March 2000 (ex. 2027).

both Villorente and Lovingood followed the acceptance criteria set out in MIL-STD-2035A(SH) (tr. 698). On the other hand, neither Harrington nor Dennis testified. Consequently, we are uncertain what acceptance criteria they followed. Moreover, we have found that interpreting RT films is more science than art, and even though subjectivity cannot be totally eliminated, most defects are quantifiable, measurable and repeatable (tr. 698-99, 721, 730). In addition, even though Dennis did not agree with Villorente's and Lovingood's interpretation on a few films, he agreed with their interpretation on the vast majority of the films interpreted. Accordingly, notwithstanding AEPCO's argument, we find SUPSHIP Portsmouth's interpretation of Si-Tech's RT films to have been fair and in accordance with the contract acceptance criteria.

PART II.

Unresolved Formal Changes

Entitlement

93. Seventy-seven (77) sequences were issued under the job order. Four of these were voided and 44 were incorporated into bilateral Modification Nos. 1B through 1K. The remaining 29 sequences were the subject of negotiation between ACO Stroud and Potter. They were unable to reach agreement with respect to Sequence Nos. 58G, 63G and 68G. (*AEPCO*, *supra*, 03-1 BCA at 158,984, ¶ 6, at 158,987, ¶ 30)

94. Subject to finalization, they were able to tentatively settle the remaining 26 sequences (23G, 31G, 37G, 42NG,[17] 44G, 46G, 54G, 56G, 57G, 59G, 60G, 61G, 62G, 64G, 65G, 66G, 67NG, 69G, 70G, 71G, 72NG, 73G, 74G, 75G, 76G, and 77G) (*AEPCO*, 03-1 BCA at 158,986, ¶ 23). Of these, Sequence Nos. 72NG, 74G, and 76G were deductive changes involving credits back to SUPSHIP Portsmouth. Before SUPSHIP Portsmouth could implement the settlement of these sequences by way of contract modifications, however, AEPCO unilaterally altered the settlement sheets and reserved its right to claim impact costs relating to delay and disruption (03-1 BCA at 158,986-87, ¶¶ 24-29). After litigation commenced, SUPSHIP Plymouth reversed its decision with respect to Sequence No. 23G (03-1 BCA at 158,987, ¶ 31).

95. Thus, with respect to these 29 unresolved sequences (which AEPCO has referred to as "unagreed [sic] formal changes"), other than 23G, only quantum issues are left (R4, tab 501-B at GOV012332).

[17] "NG" designates that the work involved was "new" work as well as "growth" work.

Constructive Changes

Entitlement

96. AEPCO's certified claim dated 30 April 2001, submitted to SUPSHIP Portsmouth on or about 18 June 2001, was in two volumes. Volume I included seven sections containing the text explaining its claimed entitlement to $2,528,672. Volume II included Exhibits A-1 through L. (R4, tabs 500-501)

97. Section 5.2 of Volume I set forth "actions and inactions of the Government which constitute Constructive Change Orders on MOUNT WHITNEY." According to AEPCO, "Constructive Changes are found to exist when a contractor is required by the Government to perform work not called for under the Job Order, and for which a formal change should have been issued, but was not." (R4, tab 500-5 at 5-7)

98. AEPCO initially claimed $596,868 for constructive changes. The amount for each alleged constructive change was to include only the "direct-performance" of that change. (R4, tab 500-5 at 5-9, figure 5.2-1) Since its initial REA, AEPCO has changed the amount claimed for each constructive change several times, although the formula for calculation has remained the same. In setting out the amount claimed for each constructive change, we use the amount shown in an appendix—Appendix A—to AEPCO's post-hearing quantum brief. The total amount claimed for all of the alleged constructive changes is $533,984:

Exhibit C Item No.	Brief Title	Proposed Adjustment
C.1	Waste Pulper Enclosure	$10,642
C.2	Government Interference With AEPCO's Performance of Main Feed Pump Shipalt 1265K	$ 56,593
C.3	Excessive Production Meeting Requirements	$ 1,651
C.4	Added Piping Materials and Installation	$ 6,155
C.5	Non-Availability of Assigned Staging Area	$ 14,544
C.6	Issuance of Job Order 89	$ 14,404
C.7	Faulty Government Definition of Shipalts	$ 56,311
C.8	Work Stoppages Due to Ship Visitors	$ 4,776
C.9	P-1 Piping for Main Feed Pumps	$160,548
C.10	Demobilization/Remobilization For Ship Deployment	$ 32,983
C.11	Work Stoppages And Extra Work Due to Additional Cleaning Requirements	$ 15,438
C.12	Uncompensated Asbestos Subcontractor	$ 24,525

C.13	Work Stoppage And Extra Work Due to Discovery of Asbestos On April 14, 2000	$ 3,378
C.14	Miscellaneous Constructive Changes	$131,075
C.15	Ship's Force Interference With Duplex Strainer Work	$ 961
	TOTAL CONSTRUCTIVE CHANGES PROPOSED ADJUSTMENT	$533,984

(App. quantum br., appendix A at 32 of 60)

Constructive Change C.1 – Waste Pulper Enclosure

99. Item No. 593-91-002, Shipalt LCC 20-1165K, required AEPCO to accomplish large solid waste pulper (R4, tab 3; tr. 1774). To accommodate the solid waste pulper, a new space had to be built on the side of the ship. This space was to be built in front of the quarterdeck, the ship's ceremonial area where VIPs came aboard. The ceremonial area was covered by a white awning. (Tr. 1775, 1957-58)

100. The record indicates that AEPCO erected the staging for the waste pulper on 19 January 2000 (R4, tab 103 at 000510; tr. 1966). To accommodate the staging, the awning over the entrance door to the quarterdeck had to be moved "[f]urther down the ship" (tr. 1975).

101. AEPCO hung fire-retardant fire cloths to protect the ship's equipment when it worked off the staging (tr. 1959, 1972, 1981). According to the captain, the fire cloths were not enough because welding sparks "were falling down on the awning and actually putting holes in it and falling down on [sailors] who were standing watch there" (tr. 1775).

102. According to Patrick T. Hill (Hill), AEPCO's structural lead man (tr. 1956), his ship superintendent instructed him to put up tarps (tr. 1967). Hill obtained several tarps from AEPCO's shop and put them up (tr. 1978). These tarps were of different colors and were not fire-retardant (tr. 1962, 1973).

103. The captain testified that the multiple tarps AEPCO put up did not cover all the areas, and the ceremonial area was still "getting sparks." He expressed his concerns again that he "needed something to protect my people, protect the quarterdeck itself" (tr. 1775). Hill maintained that he was told to replace the multiple tarps because they "looked ugly" and SUPSHIP Portsmouth wanted white tarps to go with the color scheme of the vessel (tr. 1961-62). The captain denied that the color of the tarps was an issue, and maintained that the tarps were not fire-retardant, and the gaps from strewing multiple tarps together did not protect the area from sparks (tr. 1858).

104. AEPCO then put up two large white tarps to cover a 10' x 20' area, approximately 10' high (tr. 1962, 1966, 1973). Because these tarps were also not fire-retardant (tr. 1973, 1978), AEPCO was required to replace them again with a fire-retardant tarp (tr. 1979).

105. The solid waste pulper shipalt had to be performed in accordance with NAVSEA Standard Items (R4, tab 3, Item No. 593-91-002 at 1). Standard Item No. 009-07, "Fire Prevention and Housekeeping; accomplish," invoked National Fire Protection Association (NFPA) Standard 51B and 312 (R4, tab 574 at ACO06777; tr. 1969).

106. NFPA 51B, ¶ 2-2.2, required AEPCO to ensure "the protection of combustibles from ignition" by having "the combustibles properly shielded against ignition." NFPA 51B, ¶ 3-1.1, further required the solid waste pulper enclosure being constructed by AEPCO be "suitably segregated from adjacent areas." (Constructive Change C.1 witness book, tab 6, ex. 2020 at 51B-5) NFPA 312, applicable to "vessels during the course of construction, conversion, repairs, or while laid up" required the protective coverings (*e.g.*, tarpaulins) used to protect machinery and equipment be "either noncombustible or fire retardant approved material" (*id*., tab 5, ex. 2019, ¶¶ 1.1, 2.2.3).

107. In addition to the fire cloths it initially put up to protect the ship's equipment and machinery, AEPCO was required to put up fire-retardant tarps to protect the ship's awning and ceremonial area from welding sparks generated from the waste pulper enclosure being constructed. Because the first two sets of tarps AEPCO put up were non fire-retardant, we find they did not meet the requirements of NFPA 51B, ¶ 2-2.2 of shielding the awning and the quarterdeck from ignition.

108. ACO Stroud testified that he found out about the tarp issue when AEPCO submitted its REA (tr. 1983). According to Stroud, a condition report would "give us an opportunity to answer it" (tr. 1984). In this instance, he testified "Nobody never told me anything about a tarp in no way, shape, or form" (tr. 1986).

109. AEPCO apparently did not consider being required to put up the right fire-retardant tarps to be a constructive change to the contract. No condition report was submitted for this requirement (tr. 1977, 1983).

110. For constructive change C.1, AEPCO alleges that providing a containment and providing subsequent versions of containment around the area where the waste pulper enclosure was being constructed was "not required by the Job Order, nor was such containment necessary for performance of the specified work." AEPCO contends that the directed containment installation was "merely a cosmetic installation directed by the Government to meet its desired standards of appearance." (R4, tab 501-C at GOV012341)

111. AEPCO "estimated" 221 MHs were required to "fabricate, install, and twice re-cover" the enclosure, and to remove and dispose of the enclosures. It "estimated" direct materials at $600. (R4, tab 501-C at GOV012339) AEPCO seeks $10,642 for this constructive change (app. quantum br., appendix A at 33 of 60)

DECISION

A constructive change occurs when a contractor performs work beyond the contract requirements, without a formal order under the Changes Clause, either due to an informal order from, or through the fault of, the government. *Ets-Hokin Corp. v. United States,* 420 F.2d 716, 720 (Ct. Cl. 1970); *Len Co. and Associates v. United States*, 385 F.2d 438, 443 (Ct. Cl. 1967). Before a contractor can recover on a constructive change, it must show that the government ordered it to perform "beyond the requirements of the pertinent specifications or drawings." *Ets-Hokin*, 420 F.2d at 720. The additional work ordered, however, must not be beyond the general scope of the contract. *Embassy Moving & Storage Co. v. United States*, 424 F.2d 602, 606-07 (Ct. Cl. 1970). When there is a constructive change, the government must fairly compensate the contractor for the costs of the change. *Aydin Corp. (West) v. Widnall,* 61 F.3d 1571, 1577 (Fed. Cir. 1995). On the other hand, the government has the right to insist on performance in strict compliance with the contract requirements and could require a contractor to correct nonconforming work. *S.S. Silberblatt, Inc. v. United States,* 433 F.2d 1314, 1323 (Ct. Cl. 1970).

With respect to all constructive changes, the Navy argues generally that to the extent AEPCO performed work, it cannot recover because it has failed to establish that "it was directed to do the work from a person with contractual authority" (gov't entitlement br. at 204). The record is not clear who from SUPSHIP Portsmouth had contractual authority. ACO Stroud's sole responsibility appears to have been confined to negotiating sequences after they were issued. Significant contract actions, such as directing AEPCO to subcontract welding repairs, emanated from other SUPSHIP Portsmouth contracting officials. Ship surveyor Hunt and project manager Dale appear to have been responsible for the day-to-day administration of the contract on the deck plate. The captain also appears to have had some degree of involvement. All of these people acted at one time or another as the CO's agent. Although the Changes clause[18] refers only to orders emanating from "The Contracting Officer," constructive changes may result from directions by other government agents. *Chris Berg, Inc. v. United States*, 455 F.2d 1037, 1051 (Ct. Cl. 1972) (contractor painted area after receiving the tacit and oral approval of the project engineer); *Carl J. Bonidie, Inc.,* ASBCA No. 25769, 82-2 BCA ¶ 15,818 at 78,398-99. Moreover, there is a presumption that contractors generally do not

[18] The contract incorporated by reference DFARS 252.217-7003, CHANGES (DEC 1991) (R4, tab 1, solicitation, at 32 of 66).

voluntarily do more work than required by their contracts. *Gholson, Byars & Holmes Construction Co. v. United States,* 351 F.2d 987, 994-95 (Ct. Cl. 1965).

In this case, the solid waste pulper shipalt had to be performed in accordance with NAVSEA Standard Item No. 009-07, and that in turn, invoked NFPA 51B and 312. NFPA 51B, ¶ 2-2.2, required AEPCO to ensure "the protection of combustibles from ignition" by having "the combustibles properly shielded against ignition." NFPA 51B, ¶ 3-1.1 further required the waste pulper enclosure being constructed by AEPCO be "suitably segregated from adjacent areas." (Finding 106)

Although AEPCO hung fire cloths to protect the ship's equipment and machinery, nothing was put up to segregate the waste pulper enclosure area being constructed from the adjacent areas and shield combustibles (awning and quarterdeck) from ignition. Because the first two sets of tarps AEPCO put up were not fire-retardant, and therefore could not shield the awning and the quarterdeck area from ignition, we found that they did not meet the requirement of NFPA 51B, ¶ 2-2.2. AEPCO was required to put up a fire-retardant tarp.

Because the contract required AEPCO to segregate the waste pulper enclosure being constructed from adjacent areas, and because the contract required AEPCO to shield combustibles (in this case the awning and the quarterdeck) from ignition, we hold the Navy did not constructively change the contract when it required AEPCO to put up a fire-retardant tarp.

Constructive Change C.2 – Government Interference With AEPCO's Performance of Main Feed Pump Shipalt 1265K

112. AEPCO's claim alleges:

> . . . [T]he Government repeatedly breached its obligations to allow AEPCO to perform the Main Feed Pump ShipAlt work without undue interference by Government-controlled entities. Instead of properly coordinating the work of other Government-controlled contractors and/or entities with the work of AEPCO under the Job Order, the Government required or allowed substantive work to be performed by others at the same time, and in the same working areas, as AEPCO's Main Feed Pump ShipAlt work was being performed. Such other work interfered with AEPCO's Main Feed Pump ShipAlt work, and in some cases caused AEPCO to have to perform re-work. Other work being performed by or for the Government in the area of the Main Feed Pump ShipAlt work also interfered with AEPCO's welders and

> other workers and caused them to expend extra manhours to perform the Main Feed Pump ShipAlt work.
>
> Such lack of cooperation and active interference by Government-controlled entities with the work of AEPCO constitutes a Constructive Change which entitles AEPCO to compensation for the added Main Feed Pump ShipAlt labor hours caused by the Government's interference and lack of cooperation described above.

(R4, tab 501-C at GOV012345)

113. Acknowledging that "the actual labor hours required to carry out the Main Feed Pump ShipAlt work were not segregated from other Job Order work," AEPCO used its "bid manhours and formal change manhours as a base for pricing this Constructive Change." Based on 3,500 MHs of basic MFP work and 2,332 MHs of formal change order work (derived from 23 formal change orders), AEPCO estimated that, as a result of the various alleged government-interferences described above, direct labor on the MFP increased by "at least" 20% or 1,166 MHs (5,832 MHs x 20% = 1,166 MHs). (R4, tab 501-C at GOV012345-47) Adding various mark-ups, including temporary labor and overtime premium[19], AEPCO seeks $56,593 for this constructive change, "including profit but excluding delay, disruption, and other impact" (app. quantum br., appendix A at 34 of 60). No explanation was given for the 20% increase in MHs.

114. AEPCO skipped this constructive change at the hearing on 6 March 2003 when it presented evidence on its other constructive change claims. Consequently, specific facts underlying allegations made in the claim remained unproven. Based on what evidence there is in the record, we make the following findings with respect to the alleged interferences to AEPCO's MFP work in the fire room.

115. AEPCO was not the only contractor doing work on MT. WHITNEY. Other contractors were upgrading the ship's communication system, boiler, firemain and habitability areas. Moreover, the ship's force was doing a variety of work including building an enclosed station for the helicopter flight deck. The various contractors were not working in the same areas of the vessel. The antenna work was on the main deck forward; the fire room where AEPCO was doing work on the MFPs was eight decks below. The habitability work was not done anywhere near the fire room. (Tr. 1742-43)

116. The only work being performed in the fire room was (1) NORSHIPCO's boiler work, (2) AEPCO's MFP work, and (3) ship's force's work (tr. 1743-44). The work involving the boiler was in two areas: (a) inspection of the steam drum, and (b)

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[19] AEPCO acknowledged in footnote 3 that "Premium MH does not represent time worked. It is only to recover dollars paid out" (R4, tab 501-C at GOV012347).

work inside the firebox which was "inside the boiler itself, out of the [fire room] space" (tr. 1758). The inspection was done immediately after the overhaul began; the work inside the firebox was done at the time the old MFPs were being removed and the foundations of the new MFPs were being installed (tr. 1758-59). The ship's force was doing maintenance work in the fire room (tr. 1551). According to the captain, there were no interferences of AEPCO's work by NORSHIPCO or the ship's force because each was working in a "different space" in the fire room (tr. 1760). AEPCO has not refuted this evidence. Based on the evidence before us, we find no interferences with AEPCO's work in the fire room by either NORSHIPCO or the ship's force.

DECISION

In every contract, there is an implied duty that "neither party to the contract will do anything to prevent performance thereof by the other party or that will hinder or delay him in its performance." *Lewis-Nicholson, Inc. v. United States,* 550 F.2d 26, 32 (Ct. Cl. 1977); *George A. Fuller Co. v. United States,* 69 F. Supp. 409, 411 (Ct. Cl. 1947). The contractor bears the burden of proving that the government breached its implied duty of noninterference. *Contel Advanced Systems, Inc.,* ASBCA No. 49074, 03-1 BCA ¶ 32,155 at 158,976.

Allegations in AEPCO's claim do not constitute proof. *Joseph Pickard's Sons Co. v. United States,* 532 F.2d 739, 742 (Ct. Cl. 1976). In response to AEPCO's broad allegations, the captain of the vessel testified that the work involving the boiler was in two areas: (a) inspection of the steam drum, and (b) work inside the boiler which was out of the fire room space. The inspection was done immediately after the overhaul began; the work inside the firebox was done at the time the old MFPs were being removed and the foundations were being installed. In addition, the captain testified that there were no interferences with AEPCO's work by NORSHIPCO or the ship's force because each was working in a "different space" in the fire room. AEPCO has not refuted this evidence. Based on the captain's testimony, we have found there was no interference with AEPCO's work in the fire room from either NORSHIPCO or the ship's force.

Because AEPCO has failed to prove that NORSHIPCO, the ship's force, or any other contractors interfered with its MFP work in the fire room, we hold there was no constructive change.

Constructive Change C.3 – Excessive Production Meeting Requirements

117. AEPCO's claim alleges:

> On March 6, 2000, the Supervisor's Program Management function directed AEPCO's General Manager to attend all future Production Meetings held on USS MT.

> WHITNEY. The Supervisor also required AEPCO to attend daily Production Meetings rather than the contractually-specified weekly Production Meetings. This change was ordered by the Supervisor in direct contradiction of the requirements of SI 009-60 for weekly meetings as specified in paragraph 3.8. Consequently, these meetings continued on a daily basis (7 days/week) through March 30, 2000, when the Supervisor required AEPCO to suspend further Job Order work while the ship deployed. AEPCO's costs were therefore increased during the period of March 6, 2000 through March 30, 2000.

(R4, tab 501-C at GOV012350) AEPCO also alleges that SUPSHIP Portsmouth caused its ship superintendent to attend 20 unnecessary and unplanned production meetings. AEPCO's claim contends that SUPSHIP Portsmouth's requirement in this regard was "an unwarranted, unreasonable, and unnecessary interference with AEPCO business operations which diluted AEPCO's resources and increased its costs on both the Job Order and its other concurrent work." (R4, tab 501-C at GOV0012351)

118. SUPSHIP Portsmouth does not deny that it required general manager Winder to attend daily production meetings to report on the progress of welding P-1 piping (*see* finding 64). The evidence shows that such requirement was first imposed when Kilpatrick first became involved sometime around the beginning of March 2000, and lasted until shortly before the vessel went to sea trial (tr. 2000). We find that the general manager attended 23 production meetings between 28 February and 30 March 2000.

119. AEPCO seeks $1,651, including 30 MHs of "QA/SUPERVISION," and overtime premium (3 MHs), plus 23 24-mile round trips to attend the daily production meetings. AEPCO's claim acknowledges that the computed overtime premium MH "does not represent time worked. It is only to recover dollars paid out." (R4, tab 501-C at GOV012353; app. quantum br., appendix A at 35 of 60)

120. The 33 MHs claimed were for AEPCO's ship superintendent (Parsons). Parsons was what AEPCO characterized a "direct charge" employee; *i.e.*, his time was charged to Job Order No. 0072. (Tr. 4190) Winder, AEPCO's general manager, was not a direct charge employee. His time was charged to AEPCO's "indirect cost pools" or overhead (tr. 4192). Winder drove to the daily production meetings in AEPCO's company car. AEPCO does not claim any MHs for Winder but claims the cost of 23 round trips. (Tr. 4191) No round trips are claimed for Parsons because he drove directly to the vessel every day in any case (tr. 3414).

121. The concept of salaried employees direct charging to a project such as Job Order No. 0072 can be confusing. The DCAA auditor explained that it is not an

employee's status as an exempt (salaried) or non-exempt (hourly) employee that determines whether "you're going to charge directly or indirectly" (tr. 4499). She explained that in small firms, of which she considered AEPCO to be one, even the president could be a direct charge employee when he is working on a specific project himself (tr. 4500). As far as some of AEPCO's salaried employees charging directly to Job Order No. 0072, the DCAA auditor found "The way their accounting system works is acceptable" (tr. 4505).

122. Standard Item No. 009-60, pertaining to the provision of "Schedule and Associated Reports" provides at ¶ 3.8:

> Provide cognizant shipyard management representation to participate in the weekly progress meeting at the time and location mutually agreeable to all parties. The representative must be authorized to make management decisions relative to the routine requirements of the Job Order which, in good faith, commit the contractor.

(R4, tab 574 at ACO07052, 07056) At the hearing, AEPCO's witness testified that AEPCO included the cost of attending only one meeting per week in its bid (tr. 1994, 1998).

123. Standard Item No. 009-60 provides at ¶ 3.9:

> Provide a representative whose only function is to coordinate Ship's Force work with contractor work.
>
> 3.9.1 Representative shall meet with Ship's Force coordinator on a daily basis and compare programmed Ship's Force work with the contractor schedule. The representative shall submit a report at the weekly progress conference of conflicts where programmed Ship's Force work interferes with the contractor schedule.

(R4, tab 574 at ACO07057) Based on Potter's testimony, we find the daily coordination meetings between AEPCO's representative and the ship's force coordinator took place as required (tr. 1996).

124. Standard Item No. 009-60, ¶ 3.10, requires the contractor to "[p]articipate in review conferences at the 25, 50, and 75 percent points in the availability" (R4, tab 574 at ACO07057).

DECISION

The Navy contends that Standard Item No. 009-60 required contractor representatives to attend both weekly and daily progress meetings, and that the contract did not limit meeting requirements to those specifically referenced in ¶¶ 3.8, 3.9 and 3.10. The Navy also argues that given what had occurred, it was within its rights to ask AEPCO for assurances by way of daily meetings that work would be performed. (Gov't br. at 207)

The Navy has cited no provisions of the contract that allowed it to require AEPCO's general manager and ship superintendent to attend daily production meetings with SUPSHIP Portsmouth's management. If the Navy needed the general manager and the ship superintendent because they could make commitments for AEPCO, Standard Item No. 009-60, ¶ 3.8 required at most participation in a weekly progress meeting. Paragraph 3.9 has no application to the situation here because it pertains to daily meetings between an AEPCO representative and the ship's force coordinator to coordinate their work to avoid interferences. Moreover, ¶ 3.10 required at most four meetings at specific stages of the availability to report on overall progress.

Because SUPSHIP Portsmouth's requirement for AEPCO's general manager and ship superintendent to participate in its daily management meeting between 28 February and 30 March 2000 exceeded the requirements of the contract, we hold that there was a constructive change and, subject to proof of quantum, AEPCO is entitled to an equitable adjustment.

Constructive Change C.4 – Added Piping Materials and Installation

125. AEPCO's claim alleges:

> For the Job Order Ship Alteration work packages, AEPCO prepared its bid and obtained piping material requirements, directly from the material lists on the Government-furnished drawing. The ShipAlts were a first-time installation on the lead ship, USS MOUNT WHITNEY. As explained elsewhere in the Proposal, the Government's drawings were not work-proven, and accomplishment of the ShipAlts presented more problems than the norm, apparently due to this factor. The material lists on the Government's drawings contained deficiencies which caused AEPCO to incur added labor and material costs.

(R4, tab 501-C at GOV012354)

126. AEPCO purchases three categories of material for a ship repair job. Category 1 materials are purchased based on material lists on drawings included as a part of the bidding documents, Category 2 materials are purchased for formal change orders, and Category 3 materials are purchased for "rework or work not documented in bidding documents due to drawing deficiencies." AEPCO asserts that it routinely writes condition reports to denote each installation change. (*Id*.)

127. AEPCO's claim identified 10 line items of material that it allegedly had to purchase and install that were "in excess of piping materials called out on the drawings invoked in the Job Order" (R4, tab 501-C at GOV012355). As support, AEPCO's claim referenced two documents: (a) the pricing sheet its consultant prepared, and (b) an unidentified material printout showing $684.26 worth of materials purchased (R4, tab 501-C at GOV012356-58). As for quantum, AEPCO's claim estimates that it is entitled to $6,155, including 120 hours of labor and various markups (R4, tab 501-C at GOV012357; app. quantum br., appendix A at 36 of 60).

128. In its post-hearing brief, AEPCO refers us to a number of Liaison Action Reports (LARs) (R4, tabs 118-133). We have reviewed the 16 LARs (R4, tabs 118 to 133) AEPCO directed us to in its brief. Of the 16, only 8 appear on their faces to correct quantities (or dimensions) in the drawing material lists. We find that, subject to proof of quantum, AEPCO is entitled to an equitable adjustment for the materials it purchased as reflected in the LARs at R4, tabs 118, 119, 124, 126, 127, 128, 129, and 131. As for the rest, AEPCO has left us to our own devices, and we are unable to determine on our own that any constructive changes have taken place.

129. As in the case of Constructive Change C.2, AEPCO skipped this constructive change at the hearing on 6 March 2003 when it presented evidence on constructive changes. Inasmuch as the contract presumably requires installation of the pipes wrongly described in the material lists in the first place, we are unable to find from the meager evidence before us that AEPCO is entitled to any additional labor costs to install them.

DECISION

The contractor has the burden of proof in establishing a constructive change. *Kimmins Contracting Corp.,* ASBCA No. 44265, 94-1 BCA ¶ 26,348 at 131,042; *Service Engineering Company,* ASBCA No. 40274, 93-1 BCA ¶ 25,520 at 127,119.

In this case, AEPCO broadly asserts that the shipalt drawings were not work-proven and caused it to have to purchase more materials than the drawing material lists required. It offered no further proof at the hearing. In its post-hearing brief, it refers to a number of LARs (R4, tabs 118 to 133). In reviewing the 16 LARs AEPCO referenced, we are able to determine that in 8 instances (R4, tabs 118, 119, 124, 126, 127,

128, 129, 131), additional piping materials were purchased to correct drawing material list quantities or dimensions. Without help from AEPCO, we are unable to determine on our own that any constructive changes had occurred on the rest. AEPCO suggested in its brief that a part of the material purchased was attributable to the requirement for installation of P-1 piping and the radiographic inspection of welds (app. entitlement br. at 85).

We hold that AEPCO is entitled to an equitable adjustment for the piping materials it purchased as reflected in R4, tabs 118, 119, 124, 126, 127, 128, 129, and 131. AEPCO has failed to prove that a constructive change occurred on the rest.

Constructive Change C.5 – Non-Availability of Assigned Staging Area

130. AEPCO's claim alleges that at the beginning of the availability, it was assigned a staging area alongside the MT. WHITNEY for its equipment, trailer, and tools. It alleges when snow fell on 25 January 2000, NOB maintenance personnel used the assigned staging area to pile the snow and ice cleared from various areas of NOB, and the snow and ice remained in the staging area for 30 CDs until AEPCO manually removed them on 24 February 2000. AEPCO contends that under normal circumstances, it would only have to make one or more trips from its shop 12 miles away. It estimates that it had to make two extra 24-mile round trips, except one extra trip on Sundays, for a 30-calendar day period because the Navy prevented it from using the staging area. AEPCO claims $14,544 for this alleged constructive change. (R4, tab 501-C at GOV012360; app. quantum br., appendix A at 37 of 60)

131. The staging area was located between the vessel's front and rear gangway (tr. 2002, 2028). When AEPCO began work, the ship used what was to become the staging area for parking. It took about a week for the Navy to establish another parking area on the pier (tr. 2018). The ship's force and ship surveyor Hunt "marked off" the staging area with pylons (tr. 2006).

132. AEPCO did not stake out the staging area initially because it did not want to clutter up the pier and it "tried to work with the ship until we actually needed the equipment" (tr. 2005-6).

133. Before AEPCO could move its equipment into the staging area, snow fell. In clearing off the snow on the pier for parking, the Navy "piled snow from the other parking lot in there." According to Potter, after the snow, there was a "hard freeze . . . all solid ice. And it took several weeks for it to go away." (Tr. 2018) Based on Potter's and Hill's testimony we find AEPCO did not remove the snow pile but waited for it to melt (tr. 2014, 2020).

134. SUPSHIP Portsmouth project manager Dale testified that neither the MT. WHITNEY nor the base would allow snow to pile up on the pier because "emergency vehicles have to get down there" (tr. 2024). He testified that he drove down to the vessel in a golf cart two days after the snow, and he "never saw any pile-up snow anywhere on the base" (tr. 2023).

135. Hill testified that, as a result of not having the staging area, AEPCO was delayed and incurred "increased . . . man hours because we had to have somebody coming back and forth from the shop, which wasn't real close by" (tr. 2006). There is no evidence that the cost of any specific work was increased as a result of the unavailability of the staging area.

136. Potter alleged that both ship surveyor Hunt and project manager Dale were notified by telephone about the staging area (tr. 2018). Dale denied he was notified and testified he did not know there was an issue with respect to staging until AEPCO submitted its REA (tr. 2029). No condition report was submitted. Had AEPCO done so, SUPSHIP Portsmouth might have been able to arrange for removal of the snow to make room for AEPCO's equipment (tr. 2010, 2021).

137. AEPCO acknowledged, and we find, SUPSHIP Portsmouth was not contractually required to provide AEPCO a staging area. AEPCO contends that in the past, "especially on a job this big," the Navy had provided a staging area (tr. 2020-21).

DECISION

Even though the Navy initially made available to AEPCO a staging area alongside the vessel, that area became unavailable when the base used the area for piling snow. Because the Navy was not contractually required to provide AEPCO a staging area in the first place, AEPCO did not perform "beyond the requirements of the pertinent specifications or drawings" when it performed work without a staging area. *Ets-Hokin, supra*, 420 F.2d at 720 We hold that having to make trips back to its shop to obtain equipment and materials is not a constructive change.

Constructive Change C.6 – Issuance of Job Order No. 0089

138. Job Order No. 0072, Item No. 264-31-001, requires AEPCO to replace the main lube oil purifier assembly in compartment 8-86-0-E with a new government-furnished lube oil purifier. AEPCO was also required to perform various piping, foundation, and gage work under this item. (R4, tab 2 at ACO06522-24; tab 501-C at GOV012363)

139. After AEPCO started work to rip out the existing lube oil purifier and motor, SUPSHIP Portsmouth advised that it did not have the replacement unit. SUPSHIP

Portsmouth issued a stop-work order and eventually deleted the work item. (Tr. 2031-32) The parties negotiated a $19,261 credit under Sequence No. 2G for deleting the work item (R4, tab 16). Sequence No. 2G was later incorporated into bilateral Modification No. 1C. This modification released the Navy for "all claims for delays and disruptions resulting from, caused by, or incident to such modifications or change orders." (R4, tab 94)

140. SUPSHIP Portsmouth decided to overhaul the existing lube oil purifier. It issued a RFP seeking competitive bids. The RFP added additional piping for hotel steam. Hotel steam is steam from the pier used to keep ship's hot water systems operating when boilers are shut down. (Tr. 2031, 2038)

141. AEPCO decided to bid on the lube oil purifier overhaul because it was already in the machinery space, it did not want another contractor in the same space, and it was capable of doing the work (tr. 2033-35). In responding to the RFP for Job Order No. 0089, AEPCO advised SUPSHIP Portsmouth by letter dated 8 February 2000 "[t]here will be no adverse impact between this job and other work" (R4, tab 234). On 11 February 2000, it was awarded Job Order No. 0089 for the firm fixed price of $89,242 to overhaul the existing lube oil purifier (R4, tab 237).

142. SUPSHIP Portsmouth subsequently established a "split availability" for the work covered by Job Order No. 0089. On 25 April 2000, SUPSHIP Portsmouth and AEPCO entered into bilateral Modification No. 1B (effective as of 31 March 2000). This modification changed the Job Order No. 0089 performance period from 11 February through 8 March 2000 to two periods: (1) 11 February through 8 March 2000 and (2) 14 April through 30 April 2000. The modification provides that it "does not make equitable adjustment in price to which the contractor may be entitled under the terms of the contract," and that "[s]uch equitable adjustments shall be made at a future date prior to final settlement of this contract [Job Order No. 0089]." (R4, tab 521)

143. AEPCO alleges in its claim that overhauling existing equipment would normally be growth work under Job Order No. 0072, and AEPCO was "ready, willing, and able to accept and complete the repair work as a growth item under the Job Order" (R4, tab 501-C at GOV012363). AEPCO's constructive change claim under Job Order No. 0072 is based on the following theory:

> . . . Since Job Order 72 remains open with both unadjudicated formal changes and constructive changes, AEPCO has included the "Job Order 89" impact in this Proposal. Indeed, when the Government elected to increase the scope of work under Job Order 72 by the device of issuing growth work under another "Job Order" for performance on the same ship concurrently with Job Order 72 work, a

> constructive change occurred which entitled AEPCO to an equitable adjustment under the Contract's Changes Clause for all resulting increases in time, place, or both.

(R4, tab 501-C at GOV012366)

144. According to AEPCO, Job Order No. 0089 impacted Job Order No. 0072 in the following ways: (1) it "added an unanticipated demand for skilled workmen that were critical to JO72"; (2) it added extra work to Job Order No. 0072 at a time when 53% of the work-days for Job Order No. 0072 had expired; and (3) Job Order No. 0089 undercharged SUPSHIP Portsmouth for "temporary labor and overtime" which AEPCO contends should now be charged to Job Order No. 0072. (R4, tab 501-C at GOV012366-67)

145. AEPCO calculated that 20.48 percent of the total labor expended on Job Order No. 0072 was temporary labor and 23.1 percent of the total labor expended on Job Order No. 0072 was overtime labor. Using these ratios, AEPCO estimated that it should have expended 155 temporary MHs and 152 overtime hours in connection with Job Order No. 0089. Charging such estimated Job Order No. 0089 hours to Job Order No. 0072, AEPCO contends that it is entitled to $14,404 for this constructive change. (R4, tab 501-C at GOV012367-68; app. quantum br., appendix A at 38 of 60)

146. AEPCO used the same workers to perform Job Order No. 0089, working "back and forth," as Job Order No. 0072. AEPCO acknowledged when its men worked on two different jobs, they recorded their time separately. (Tr. 2035) With respect to the impact of Job Order No. 0089 on Job Order No. 0072, AEPCO's claim concedes "it was not possible to accurately segregate the impact on Job Order 72 work caused by 'Job Order 89' work" except by means of "engineering judgment" (R4, tab 501-C at GOV012367).

147. Other than what it stated in its claim, AEPCO provided no elaboration on the impact of Job Order No. 0089 on Job Order No. 0072 at the hearing. At the hearing, it focused on an incident relating to the installation of hotel steam under Job Order No. 0089. The record shows that on 22 February 2000, AEPCO submitted to SUPSHIP Portsmouth Condition Report No. 007 (under Job Order No. 0089). The report stated that AEPCO had been directed to work on hotel steam over a weekend. AEPCO complained that this would require "all labor to be accomplished on an overtime basis." The report stated that AEPCO "did not bid this item to accomplish on an all overtime burden" and asked to be compensated for overtime and acceleration to complete the requirements of replacing hotel steam system. (AEPCO Trial Notebook for Constructive Changes – Non-MFP Work Items, tab H.R.1, ex. 1013) A review of Job Order No. 0072 documents, including its modifications, does not show any work items relating to hotel

steam. We find hotel steam relates to Job Order No. 0089; it is not a Job Order No. 0072 work item.

148. Potter testified AEPCO was directed to start the hotel steam work at 4:00 p.m., and to have it back up for breakfast the next morning (tr. 2037). In response to Condition Report No. 007, Jonna Walker (Walker), ship surveyor Hunt's assistant, noted on the condition report on 29 February 2000:

> NAR [No Action Required]
>
> To be covered under JO 0072

(AEPCO Trial Notebook for Constructive Changes – Non-MFP Work Items, tab H.R.1, ex. 1013) Potter testified:

> . . . I submitted this report for overtime on the job order 89, and it was answered that they will pay me on job order 72. I have no idea why they were doing that, none whatsoever.

Potter also testified that AEPCO "never got paid for No. 72." (Tr. 2037)

149. Walker's note is too cryptic to be helpful. Without further explanation, we are unable to find a reason that costs relating to Job Order No. 0089 should be charged to Job Order No. 0072.

DECISION

AEPCO appears to be contending that adding new work by way of a separate job order constituted a constructive change under Job Order No. 0072. We disagree. A constructive change occurs when a contractor performs work beyond the contract requirements without a formal change order under the Changes Clause of that contract. *Ets-Hokin, supra*, 420 F.2d at 720. In this case, AEPCO performed no installation work on the lube oil purifier because that work had been deleted from the contract. What it did perform was new work (overhauling the existing lube oil purifier) that it voluntarily competed for and won under a separate FFP job order.

We have found that hotel steam is not a part of Job Order No. 0072 work but work relating to Job Order No. 0089. AEPCO has not explained, nor are we able to discern from the record before us, why costs incurred in connection with another Job Order should be paid under Job Order No. 0072.

Because AEPCO has not proved it was required to perform any lube oil purifier work (deleted and settled by way of Sequence No. 2G and bilateral Modification No. 1C) beyond the requirements of Job Order No. 0072, and because it has not explained why costs incurred under Job Order No. 0089 should be charged to Job Order No. 0072, we hold there is no basis for an equitable adjustment for a constructive change.

Constructive Change C.7 – Faulty Government Definition of Shipalts

150. AEPCO alleges that at the 11th hour after the due date for submission of proposals, the Navy added four shipalts that doubled the work required by the original job order. AEPCO also alleges that the Navy did not provide the shipalt drawings until New Year's Eve "leaving insufficient time for AEPCO to identify vendors and suppliers for all of the required items." It says further that:

> . . . AEPCO was compelled to expend considerable time and effort during performance to perform research and identify "work arounds" for long lead time material that could not be obtain [sic] in time to support the contract schedule, and to resolve performance discrepancies in the Government furnished drawings.

According to AEPCO, "a constructive contract change occurred when the Government furnished drawings on the MOUNT WHITNEY contract proved defective and necessitated additional effort by AEPCO to overcome the deficiencies." (App. entitlement br. at 90-91)

151. AEPCO's claim estimated that 80 MHs of labor was expended in connection with this alleged constructive change. With various markups, it seeks an equitable adjustment of $56,311. (R4, tab 501-C at GOV012375; app. quantum br., appendix A at 39 of 60)

152. As in the case of Constructive Changes C.2 and C.4, AEPCO skipped this constructive change at the 6 March 2003 hearing when it presented evidence on its other constructive change claims. Consequently, we are left with nothing beyond the allegations in its claim as support for entitlement.

153. AEPCO's post-hearing brief on entitlement did refer us to the documents under Rule 4, tab 235, as an example in support of its claim. Tab 235 shows that AEPCO by letter dated 9 February 2000 advised SUPSHIP Portsmouth that V-6 and V-7 of Drawing No. 208-7289307 possibly did not match. AEPCO sought clarification and sought permission to substitute socket weld valves because the delivery time for the flanged valves would be 26-52 weeks. A 10 February 2000 response from Puget Sound Naval Shipyard, Detachment Boston (Boston Planning Yard) confirmed that the drawing

was correct and authorized the substitution due to excessive lead-time. (R4, tab 235) We are not told how approving a substitution to alleviate a long lead-time situation constituted a constructive change.

DECISION

AEPCO's general allegations ring hollow in light of the contrary testimony given by its own witnesses. Davis, its estimator, testified at his deposition that SUPSHIP Portsmouth's extension to 9 a.m., 11 January 2000, as the proposal closing time did provide AEPCO enough time to complete its estimate and to put its proposal together (finding 16). Withers, AEPCO's purchasing manager, testified when AEPCO submitted its proposal on 11 January 2000, she had probably received 99.5 % of the material quotes (finding 27).

Beyond its brief reference to Rule 4, tab 235, AEPCO has provided no proof in terms of which specific drawings were defective and necessitated additional effort on its part to overcome the deficiencies. We hold that AEPCO has failed to prove entitlement on this alleged constructive change.

Constructive Change C.8 – Work Stoppages Due to Ship Visitors

154. On 16 March 2000, AEPCO submitted to SUPSHIP Portsmouth Condition Report No. 142. This report stated that on 6 March 2000, the ship's force stopped AEPCO's work, and directed a shut down of all equipment from 10 a.m. to 4 p.m. due to dignitaries coming on board. The report sought to be paid 140 MHs of standby costs for various trades. (R4, tab 107, Condition Report No. 142)

155. Also on 16 March 2000, AEPCO submitted Condition Report No. 138. This report stated that on 7 March 2000 the ship's force stopped AEPCO's work at 11 a.m., and it was not allowed to resume work until 4 p.m., due to dignitaries coming on board. The report sought to be paid 112 MHs standby costs for various trades. (R4, tab 107, Condition Report No. 138)

156. Again, on 16 March 2000, AEPCO submitted Condition Report No. 139. This report stated that on 13 March 2000, the ship's force stopped AEPCO's work, including running of machinery from 9 a.m. to 10 a.m., due to dignitaries coming on board. The report sought to be paid 28 MHs standby costs for various trades. (R4, tab 107, Condition Report No. 139)

157. On 22 March 2000, SUPSHIP Portsmouth issued (1) Sequence No. 49G in the amount of $4,819, compensating AEPCO for the work stoppage described in Condition Report No. 138 (R4, tab 57); (2) Sequence No. 50G in the amount of $1,197, compensating AEPCO for the work stoppage described in Condition Report No. 139 (R4,

tab 58); and (3) Sequence No. 51G in the amount of $6,014, compensating AEPCO for the work stoppage described in Condition Report No. 142 (R4, tab 59). These sequences were subsequently incorporated into bilateral Modification No. 1K. That modification, signed by the parties in April 2000, contains the following release:

> 3. . . . The . . . price described above is considered to be fair and reasonable and has been mutually agreed upon in full and final settlement of all claims arising out of this modification and any other modifications or change orders indicated above, including all claims for delays and disruptions resulting from, caused by, or incident to such modifications or change orders.

(R4, tab 101 at 2)

158. In its claim, AEPCO seeks to recover 90 additional MHs of "shut down" and "re-start" time including 9 overtime premium MHs totaling $4,776 contending:

> . . . [N]one of the 3 Sequences issued by the Supervisor included compensation for the non-productive time incurred by AEPCO in stopping and re-starting its work on these occasions. AEPCO estimates that each worker lost ½ hour of production time each time the Ship's Force required that worker to shut down work and later re-start work[.] Such non-productive time is in addition to the actual labor hours lost during the actual shutdown periods.

(R4, tab 501-C at GOV012376-77; app. quantum br., appendix A at 40 of 60) Other than the foregoing allegations, there is no proof that any non-productive time associated with stopping and re-starting work during dignitary visits on 6, 7, and 13 March 2000 was excluded when Sequence Nos. 49G, 50G, and 51G were negotiated and agreed upon.

DECISION

The 90 MHs claimed were not based on documentary or testimonial evidence; they were based on an estimate by AEPCO's claims consultant. There is no evidence that such hours were not considered when Sequence Nos. 49G, 50G, and 51G were negotiated and agreed upon. We deem the shut-down and re-start time AEPCO claims to have arisen out of the incidents that led to the issuance of Sequence Nos. 49G, 50G, and 51G. Inasmuch as these sequences are a part of bilateral Modification No. 1K (*see* R4, tab 101), we hold that AEPCO had unqualifiedly released SUPSHIP Portsmouth and is not entitled to further equitable adjustment. *QES, Inc.*, ASBCA No. 22443, 78-2 BCA ¶ 13,490 at 66,032 (a contract modification, complete on its face is binding on the parties

within the agreed scope and may not be disturbed unilaterally in the absence of fraud or other special circumstances such as mutual mistake, collusion or duress).

Constructive Change C.9 – P-1 Piping for Main Feed Pumps

159. This alleged constructive change encompasses a host of issues ranging from whether P-1 piping was required, to whether RT of P-1 piping butt weld joints was required, to whether SUPSHIP Portsmouth properly interpreted the RT films and required AEPCO to rework rejected joints, to whether SUPSHIP Portsmouth could be held responsible for accelerating AEPCO's performance due to the added work growing out of RT and rework of the rejected butt welds. (R4, tab 501-C at GOV012380-435)

160. Excluding delay, acceleration and disruption, AEPCO estimated that 1,754 additional MHs were required for the direct performance of all the extra work identified in Constructive Change C.9. Adding an estimated amount of $97,060 for direct materials, and crediting the Navy $75,742, AEPCO admits the parties "had tentatively agreed for the incorporation of the changes made by Sequence #23," AEPCO claims $160,548 for Constructive Change C.9. (R4, tab 501-C at GOV012400, 012407, 012410; app. quantum br., appendix A at 41 of 60)

161. Because the issues AEPCO raised here duplicate the issues raised in connection with the requirement for, the RT of, and the welding and rework of, the MFP P-1 piping, we believe it is appropriate to defer addressing them until those issues are discussed later in this decision.

Constructive Change C.10 – Demobilization/Remobilization for Ship Deployment

162. For this constructive change, AEPCO alleges that it bid the MT. WHITNEY job order with the expectation that it would be allowed to complete its work in "one continuous operation." It alleges despite the issuance of numerous formal and constructive changes, SUPSHIP Portsmouth refused to extend the CCD. AEPCO's claim states:

> Consequently, the Supervisor established a "Split Availability" which required AEPCO to leave the ship for a period of time . . . before returning to complete the revised Job Order work. After the Government allowed AEPCO to resume Job Order performance on April 14, 2000, the remaining Job Order work was performed less efficiently. . . .

(R4, tab 501-C at GOV012437-38)

163. AEPCO's claim noted that it recognized it "was allowed access to the ship during the basic Job Order suspension period (4/1/2000–4/14/2000) for performance of a limited amount of alleged 'discrepancy' correction" (R4, tab 501-C at GOV012436-37).

164. The claim estimated that AEPCO incurred the following added direct labor hours on account of this alleged constructive change:

● March Demobilization	240 manhours
● 4/14/00 Remobilization	160 manhours
● Extra Travel Time, Toolroom/Material Support, etc. 4/14-4/30-00	160 manhours
● Added Project Support Labor, 4/14-4/30-00	56 manhours
TOTAL	616 manhours

(R4, tab 501-C at GOV12438)

165. AEPCO seeks $32,983 for Constructive Change C.10, including $616 in consumables and $1,700 in estimated added incidental material (R4, tab 501-C at GOV012440; app. quantum br., appendix A at 42 of 60). The amount is said to include profit but exclude delay, disruption, and other impact (R4, tab 501-C at GOV012439).

DECISION

Following sea trial on 30 March 2000, MT. WHITNEY was made available to AEPCO for corrective work from 2 to 10 April, 14 to 30 April, and 4 to 6 May 2000 (findings 256, 261, 267, 270, *infra*). Contrary to AEPCO's assertion, SUPSHIP Portsmouth did not establish a split availability from 14 to 30 April 2000 for Job Order No. 0072. That availability was established by modification under a separate job order which AEPCO separately bid and won—Job Order No. 0089—for overhauling MT. WHITNEY's lube oil purifier, and AEPCO was allowed to take advantage of that availability to perform corrective work and to complete incomplete contract work on Job Order No. 0072 (*see* Constructive Change C.6).

Because AEPCO was performing corrective work and completing contract work during the 2-10 and 14-30 April 2000 availabilities, and because such work was its contractual responsibility, we hold that AEPCO is not entitled to recover demobilization and mobilization costs as a constructive change.

Constructive Change C.11 – Work Stoppages and Extra Work Due to Additional Cleaning Requirements

166. Job Order No. 0072 incorporated by reference FAR 52.237-2, PROTECTION OF GOVERNMENT BUILDINGS, EQUIPMENT, AND VEGETATION (APR 1984). This clause provides:

> The Contractor shall use reasonable care to avoid damaging existing buildings, equipment, and vegetation on the Government installation. If the Contractor's failure to use reasonable care causes damage to any of this property, the Contractor shall replace or repair the damage at no expense to the Government as the Contracting Officer directs. If the Contractor fails or refuses to make such repair or replacement, the Contractor shall be liable for the cost, which may be deducted from the contract price.

(R4, tab 1, solicitation at 31 of 66)

167. One of the Standard Items AEPCO was required to follow was Standard Item No. 009-06, "Protection During Contamination–Producing Operations and Maintaining Cleanliness; accomplish" (R4, tab 1 at ACO06468; tr. 2083). This Standard Item required AEPCO to maintain "cleanliness of the ship, ship's equipment, components, and spaces for the duration of the availability," including prevention of "contamination and surface damage of the ship's/craft's equipment, components, and spaces during contamination-producing operations" (R4, tab 574 at ACO06773, ¶¶ 3.1, 3.2). Moreover, it required AEPCO to "[m]aintain cleanliness of the work site . . . free from accumulation of industrial debris caused by contractor and/or subcontractor employees on a continuous basis throughout the availability." "Work spaces" is defined to include areas "immediately under and adjacent . . . the work site." (R4, tab 574 at ACO06774, ¶ 3.4)

168. AEPCO acknowledged that it had to clean up after itself. Its witness testified he was instructed by his boss to mop, to "rag down areas" with cleaning solution, and to use stainless steel cleaner to "wipe down and shine the stainless steel panels [in the waste pulper area] instead of just wiping with a rag and go on." (Tr. 2077-78) AEPCO has not asserted that it was required to improve the condition in which it found the stainless steel panels.

169. AEPCO's witness also testified that he had to send people to clean the camel daily (tr. 2079-80). The camel is a barge (tr. 2080). It is common to place a camel abreast the ship. Its purpose is to prevent damage to both ship and pier. (Tr. 2085) In this case, the Navy provided the camel. The camel was painted white. (Tr. 2080, 2086)

170. The camel was placed under and adjacent to the area where AEPCO was doing work on the waste pulper and its enclosure (tr. 2084-85). AEPCO acknowledged that it generated metal shavings in the waste pulper area (tr. 2088-89). The metal shavings, being carbon steel, would rust overnight and turn the white paint of the camel brown if not swept off daily (tr. 2090). In the past, a contractor ended up having to spend money to repaint the camel when it was not cleaned daily (tr. 2079-80, 2089).

171. AEPCO's claim alleges that it was directed by the ship's force to (1) clean the work area in the proximity of the deckhouse installation, and (2) clean the camel almost daily. AEPCO contends that on a normal alteration job, it could expect to clean the camel no more than two or three times, and that it could expect to routinely remove any debris to maintain a safe working environment. AEPCO estimates that the work stoppages and the additional work of added cleaning directed by the ship's force caused AEPCO to incur extra costs for 287 more MHs than were required by the Job Order. It contends that it is entitled to $15,438 for this alleged constructive change, including profit but excluding delay, disruption and other impact. (R4, tab 501-C at GOV012441-42; app. quantum br., appendix A at 43 of 60)

172. At the hearing, AEPCO's witness testified that he was directed to clean certain work areas of the vessel and the camel by his ship superintendent, and SUPSHIP Portsmouth's ship surveyor (tr. 2078, 2080-81). No condition reports were submitted seeking a sequence be issued for alleged excessive cleaning of the waste pulper area or the camel.

173. AEPCO maintains that it complied with Standard Item No. 009-60, and that the camel was "not part of the ship. It was part of the pier" (tr. 2084), and it was not required to work "over the side of the ship" (tr. 2088).

DECISION

AEPCO acknowledged that its work in constructing the waste pulper and its enclosure generated metal shavings. Metal shavings left on the camel would rust overnight and would turn the camel from white to brown. We believe that asking AEPCO to clean the camel daily was within the scope of FAR 52.237-2. Although the camel was not a part of the vessel, it was equipment on the government installation. Under FAR 52.237-2, AEPCO was to use reasonable care to avoid damaging equipment on the government installation or replace or repair property it damaged at its cost. Moreover, even though the camel is arguably not a part of the ship, it was placed under and adjacent to the area where AEPCO was doing work on the waste pulper and the enclosure. Under Standard Item No. 009-06, AEPCO was required to maintain cleanliness of work spaces which include areas immediately under and adjacent the work site.

Given that metal shavings on the camel would rust overnight, and given the language of FAR 52.237-2, and Standard Item No. 009-06, ¶ 3.4, we do not believe it was beyond the scope of Job Order No. 0072 to require AEPCO to clean the camel daily. Nor are we persuaded that it was beyond the scope of Standard Item 009-06 to require AEPCO to clean the steel panels in the waste pulper area with solutions. It has not been shown that a simple wipe down with rags was sufficient to maintain them in the condition in which they were found by AEPCO.

Because daily cleaning of the waste pulper area and the camel was within the scope of the contract requirements, we hold AEPCO is not entitled to an equitable adjustment as a constructive change.

Constructive Change C.12 – Uncompensated Asbestos Subcontractor

174. Arcon, Inc. (Arcon) was AEPCO's lagging as well as asbestos removal subcontractor on Job Order No. 0072 (tr. 2093-94).

5 March 2000 Asbestos Removal (CR No. 001 (REV))

175. On 9 March 2000, Arcon submitted to AEPCO Condition Report (CR) No. 001 REVISED. It sought labor (premium time) and material for asbestos cleanup around a 10' by 10' area of the MFPs on 5 March 2000. (R4, tab 107, Condition Report No. 183 at Arcon CR No. 001 REVISED)

176. On 22 March 2000, SUPSHIP Portsmouth issued Sequence No. 44G in the amount of $11,432 to "[c]ompensate contractor for *delay and disruption* due to asbestos contamination in Fireroom 3/5/00" (emphasis added) (R4, tab 67). Sequence No. 44G is one of the 28 out of 29 sequences which were not covered by bilateral Modification Nos. 1B through 1K, but as to which the Navy has conceded entitlement although quantum still remains in dispute (*see AEPCO*, 03-1 BCA at 158,991-92, Count I (Formal Change Orders).

177. Sequence No. 44G addressed only the costs of delay and disruption to AEPCO in the fireroom. It did not pay for Arcon's work in "removing asbestos" (tr. 2105). Under Constructive Change C.12, AEPCO seeks $3,780 for Arcon CR No. 001 (REV) "including profit but excluding delay, disruption, and other impact" (R4, tab 501-C at GOV012445).

178. Arcon submitted to AEPCO Invoice No. 2106-5 dated 4 April 2000 for the asbestos cleanup work performed on the vessel on 5 March 2000 (CR No. 001 (REV)). AEPCO paid the amount invoiced, $3,780, by Check No. 4165, dated 30 April 2000. (Ex. 1022)

11 March 2000 Asbestos Work (CR No. 004)

179. On 11 March 2000, Arcon was asked to evaluate an area in the fireroom for asbestos. Arcon "took a bulk sample of the exposed material and encapsulated the open-end of the identified pipe lagging." The material tested positive for asbestos but was below the Environmental Protection Agency (EPA) recommended airborne fibre clearance level. On 13 March 2000, Arcon submitted CR No. 004 to AEPCO, seeking $1,918 for "services rendered on 03-11-00." (R4, tab 107, Condition Report No. 183 at Arcon CR No. 004)

180. On 22 March 2000, SUPSHIP Portsmouth issued Sequence No. 45G to "[c]ompensate contractor for delay and disruption due to asbestos contamination in Fireroom 3/11/00" (R4, tab 54).

181. Sequence No. 45G was among the 13 sequences that were the subject of bilateral Modification No. 1K (*AEPCO*, *supra*, 03-1 BCA at 158,985, ¶ 16; R4, tab 101). Bilateral Modification No. 1K, executed by the parties in April 2000, contained a release which provided:

> The change in . . . price described above is considered to be fair and reasonable and has been mutually agreed upon in full and final settlement of all claims arising out of this modification . . . including all claims for delays and disruptions resulting from, caused by, or incident to such modifications or change orders.

As indicated in bilateral Modification No. 1K, Sequence No. 45G was settled for $5,117. (R4, tab 101) There is no indication that Sequence No. 45G covered, or was intended to cover, the asbestos work performed by Arcon.

12 March 2000 Asbestos Work (CR No. 005)

182. On 12 March 2000, Arcon was requested to evaluate a situation in the fireroom for asbestos. Arcon capped the ends of a few pipes. Air samples were taken. The samples indicated no abatement was required. On 13 March 2000, Arcon submitted to AEPCO CR No. 005, seeking $2,836 for "services rendered on 03-12-00." (R4, tab 107, Condition Report No. 183 at Arcon CR No. 005)

183. On 22 March 2000, SUPSHIP Portsmouth issued Sequence No. 46G to "[c]ompensate contractor for delay and disruption due to asbestos contamination in Fireroom 3/12/00" (R4, tab 68). There is no indication that Sequence No. 46G covered, or was intended to cover, the services Arcon rendered on 12 March 2000.

184. Sequence No. 46G is one of the 29 sequences not settled by bilateral Modification Nos. 1B through 1K. The Navy has conceded there is entitlement on this sequence. (*AEPCO, supra*, 03-1 BCA at 158,991)

14 March 2000 Asbestos Work (CR No. 007)

185. On 14 March 2000, Arcon responded to a request from AEPCO to take a bulk sample of debris around manhole cover on lower level of the fireroom on MT. WHITNEY. The result came back negative for asbestos. On 14 March 2000, Arcon submitted to AEPCO CR No. 007 "for services rendered on 03-14-00." (R4, tab 107, Condition Report No. 183 at Arcon CR No. 007) The Navy has acknowledged that a sequence should have been issued for the asbestos work Arcon performed on 14 March 2000 (gov't entitlement br. at 212).

186. Arcon submitted to AEPCO Invoice No. 2106-3 dated 20 March 2000 for asbestos work performed on the vessel on 11, 12, and 14 March 2000 (CR Nos. 004, 005, 007). AEPCO paid the amount invoiced, $6,106 ($1,918 + $2,836 + $1,352), by Check No. 4007 dated 20 April 2000. (Ex. 1022)

Arcon Overtime Relating to Lagging

187. On 29 March 2000, Arcon submitted to AEPCO CR No. 010. The subject of the report was "Overtime used on MFP's." The report asserted that "Arcon was directed to work overtime to assist Aepco" on 03/11, 12, 15, 16, 17, 18, 19, 20, 25, 26, 27, and 28, 2000 for a total of 766 MHs. Arcon wanted to be compensated for "overtime portion of labor." It did not specify the amount sought. (R4, tab 107, Condition Report No. 183 at Arcon CR No. 010) AEPCO acknowledged that this condition report did not relate to asbestos abatement. Rather, it related to its lagging work "[w]hen we got behind in the welding." Arcon had bid to perform lagging work as AEPCO's subcontractor "on [a] straight time" basis. (Tr. 2110) Inasmuch as AEPCO has not shown the Navy was responsible for such overtime charges, we find no basis for an equitable adjustment.

14 April 2000 Asbestos Work (CR No. 012)

188. On 14 April 2000, Arcon was asked to inspect a suspected asbestos spill on the vessel. A sample was taken. Arcon cleaned up and sealed the area where the suspected asbestos was loose. On 18 April 2000, Arcon submitted CR No. 012 for 13 MHs of work. (R4, tab 107, Condition Report No. 183 at Arcon CR No. 012; tr. 2111) The Navy has acknowledged that a sequence should have been issued for the asbestos work Arcon performed on 14 April 2000 (gov't entitlement br. at 212).

189. Arcon submitted to AEPCO Invoice No. 2106-12 dated 2 May 2000 for asbestos work performed on the vessel on 14 April 2000 (CR No. 012). AEPCO paid the amount invoiced, $476, by Check No. 4885 dated 16 June 2000. (Ex. 1022)

Premium Hours Arcon Worked On 18, 22 and 23 April 2000

190. On 24 April 2000, Arcon submitted to AEPCO CR No. 013. The report sought 121 premium hours of labor worked on 18, 22 and 23 April 2000 "TO STAY ON TOP OF THE JOB DUE TO THE MANY DELAYS AND DISRUPTIONS." (R4, tab 107, Condition Report No. 183 at Arcon CR No. 013) AEPCO acknowledged that this condition report did not relate to asbestos abatement. Potter testified that "[t]he sub is asking me for compensation because he had been placed in an overtime acceleration mode, just like we were" (tr. 2111). Inasmuch as AEPCO has not shown the Navy was responsible for the premium labor hours incurred by Arcon, we find no basis for an equitable adjustment.

191. On 10 July 2000, after all work on the MT. WHITNEY had been completed, AEPCO submitted Condition Report No. 183 to SUPSHIP Portsmouth. The report stated:

> . . . [O]ur records indicate the following sub contractor [sic] reports were not submitted to the government. Please find the attached ARCON Reports 001 revised, 004, 005, 006[20], 007, 010, 012 and 013. These reports involved D&D caused by the ship, excessive overtime required as a result of Main Feed Pump Piping and Asbestos removal. AEPCO has reviewed and concurs with the attached reports.

AEPCO sought compensation for additional labor and material referenced in the attached reports but did not specify a total amount. (R4, tab 107, Condition Report No. 183)

192. Ship surveyor Hunt responded on 12 July 2000 with the note "NAR: 009-10 PARA. 3!" (R4, tab 107, Condition Report No. 183). Standard Item No. 009-10 pertains to the control of shipboard asbestos-containing material, and has nothing to do with compensating a subcontractor for delay and disruption and overtime work (*see* R4, tab 574 at ACO06794).

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[20] CR No. 006 related to an asbestos incident on 13 March 2000 (R4, tab 107, Condition Report 183 at Arcon CR No. 006). AEPCO did not claim this incident as a part of Constructive Change C.12 (*see* R4, tab 501-C at GOV012445).

193. Submitted under the heading "UNCOMPENSATED ASBESTOS SUBCONTRACTOR," Constructive Change C.12 seeks an equitable adjustment for the following Arcon CRs:

Arcon CR	Amount	Date
CR 001(REV)	$ 3,780.00	3/7/00[21]
CR 004	$ 1,918.00	3/11/00
CR 005	$ 2,836.00	3/12/00
CR 007	$ 1,352.00	3/14/00
CR 010	$ 6,894.00	3/11-3/28/00
CR 012	$ 476.00	4/17/00
CR 013	$ 1,089.00	4/24/00
	$18,345.00	

(R4, tab 501-C at GOV012444-45) With various markups, AEPCO claims $24,525 for this constructive change (R4, tab 501-C at GOV12446; app. quantum br., appendix A at 44 of 60).

DECISION

Under Constructive Change C.12, AEPCO seeks to be compensated for the services rendered by its asbestos subcontractor Arcon on the vessel on 5 March 2000 (CR No. 001 (REV)), 11 March 2000 (CR No. 004), 12 March 2000 (CR No. 005), 14 March 2000 (CR No. 007), and 14 April 2000 (CR No. 012). With respect to CR No. 001 (REV), we have found Sequence No. 44G issued covered only delay and disruption to AEPCO but did not cover the asbestos work performed by Arcon on 5 March 2000. The same is true with respect to CR No. 004 (Sequence No. 45G) and CR No. 005 (Sequence No. 46G). The Navy has not argued that any of the asbestos-related work performed by Arcon was within the original scope of the job order. It has acknowledged that a sequence should have been issued for the work covered by CR Nos. 007 and 012.

With respect to the overtime costs claimed under CR No. 010, and the premium hour costs claimed under CR No. 013, AEPCO has not shown that the Navy was responsible for these costs. We conclude, therefore, that AEPCO is not entitled to an equitable adjustment for CR Nos. 010 and 013.

Based on the forgoing discussion, we hold that AEPCO is entitled to recover for services rendered by its asbestos subcontractor Arcon on 5 March 2000 (CR No. 001 REV), 11 March 2000 (CR No. 004), 12 March 2000 (CR No. 005), 14 March 2000 (CR No. 007), and 14 April 2000 (CR No. 012).

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[21] The evidence shows CR No. 001 REV was for asbestos cleanup work performed by Arcon on 5 March 2000 (*see* finding 175).

Constructive Change C.13 – Work Stoppage and Extra Work Due to Discovery of Asbestos on April 14, 2000

194. This constructive change claim is related to the discovery of asbestos on board the vessel on 14 April 2000 (CR No. 012). AEPCO alleges that as a result of discovery of asbestos, it had to stop work. According to AEPCO, it took seven hours to clear the work area, await the arrival of Arcon to encapsulate and remove the asbestos and certify the space to be safe before it could resume work in the area. AEPCO alleges that while it had been given an equitable adjustment for delay and disruption associated with other instances of work stoppage due to asbestos (*i.e.,* Sequence Nos. 44G, 45G and 46G) "no amounts have been paid to AEPCO for the additional labor and material due to the April 14, 2000 asbestos discovery." AEPCO contends it is entitled to $3,378 for this constructive change. (R4, tab 501-C at GOV12447-48; app. quantum br., appendix A at 45 of 60)

195. AEPCO asserted that it lost 28 pipefitter MHs, 28 welder MHs, 13 QA supervision MHs and 6 overtime premium MHs for a total of 75 MHs. AEPCO acknowledged that "[c]omputed O.T. Premium MH does not represent time worked. It is only to recover dollars paid out." (R4, tab 501-C at GOV012449)

196. The Navy acknowledged there was an asbestos event on 14 April 2000, and acknowledged that AEPCO is entitled to an equitable adjustment due to work stoppage. The Navy disputes the quantity of MHs claimed. (Tr. 2114) It has not taken a position on what would be appropriate.

197. Absent evidence to the contrary, we accept 28 pipefitter MHs, 28 welder MHs and 13 QA/Supervision MHs for a total of 69 MHs as AEPCO's standby MHs while asbestos abatement was being conducted on 14 April 2000. We disallow six hours of overtime premium MHs which AEPCO admitted were not actually worked in connection with Constructive Change C.13

DECISION

This constructive change relates to the discovery of asbestos on board the vessel on 14 April 2000. AEPCO had to stop work for seven hours waiting for Arcon to encapsulate, remove and certify the affected space as safe before resuming work. As indicated in the last constructive change claim, AEPCO paid Arcon $476 for the work performed on that day. The Navy had paid for similar asbestos-related work stoppages by AEPCO on other occasions (*see e.g.,* Sequence Nos. 44G, 45G and 46G). On the claim here, the Navy has acknowledged and we hold AEPCO is entitled to an equitable adjustment. The only remaining issue relates to the quantum of adjustment. The Navy disputes that AEPCO is entitled to the MHs claimed.

Constructive Change C.14 – Miscellaneous Constructive Changes

198. The penultimate section included nine subsections of constructive changes (C.14.A through C.14.I) that AEPCO initially "did not have sufficient time to fully define and price out . . . within the time allowed by the Government for submitting equitable adjustment proposals under the Job Order." AEPCO's Supplemental Proposal provided individual "estimate sheets and pricing" for each of the nine alleged constructive changes. (R4, tab 501-C at GOV012450-53)

1. Miscellaneous Constructive Change C.14.A – Ship's Force Fire Drill

199. In its claim, AEPCO alleges that "[t]he MOUNT WHITNEY ship's Force held regular Fire Drills (basically twice a week), and AEPCO's workers were prevented from doing their assigned work during a part of most such drills" (R4, tab 501-C at GOV012450).

200. AEPCO's witness testified that on most ships, fire drills would be conducted "in the afternoon, in the evening, or even during our lunch." He testified on the MT. WHITNEY, drills were not conducted early in the morning or around the time of shift change but were conducted "when they wanted to have them." (Tr. 2117) He testified that full gear fire drills did not occur daily but would take place one or more times a week, and during these drills "we had to stand fast or stay on the job site working on the vessel" (tr. 2119, 2129-30).

201. The captain of the vessel testified that during the early part of the availability, the ship's force conducted fire drills after AEPCO's work force had completed its work. Later, when AEPCO was working around the clock, fire drills were conducted around the time of shift change so as not to interfere with AEPCO's work. (Tr. 1859, 1863) He also testified that the more involved fire drills towards the end of the availability were conducted "around a shift change" and away from the fire room where the MFP work was being done. The captain maintained that AEPCO did not have to stop work on account of the fire drills. (Tr. 1862-63)

202. AEPCO estimated that it lost 685 MHs of work as a result of the fire drills. It claims $35,917 for this constructive change. (R4, tab 501-C at GOV012456; app. quantum br., appendix A at 46 of 60)

203. Other than its witness' general testimony, there is no specific evidence as to when the fire drills occurred, what specific work was stopped, and how long work was stopped. AEPCO could easily have documented the interfering incidents by submitting condition reports as it did in cases of asbestos discovery and VIP visitations. Based on

the lack of credible support, we find AEPCO has failed to prove entitlement on this constructive change.

DECISION

Because AEPCO has failed to prove by a preponderance of the evidence that any specific work was adversely affected by the fire drills conducted during the course of the ship's availability, we hold there is no constructive change for which AEPCO is entitled to an equitable adjustment.

2. Miscellaneous Constructive Change C.14.B – Hot Work Requests

204. In its claim, AEPCO alleges:

> . . . Unlike the practice of most ships which approve Hot Work Requests (HWRs) for 24-hour periods, the Ship's Force refused to approve HWRs for more than 8-hour work periods. This non-cooperative action by the Ship's Force often caused AEPCO to obtain approvals of HWRs 3 times per day because AEPCO was working around the clock. Additionally, AEPCO was often delayed for substantial periods awaiting Ship's Force action on HWRs. Accordingly, AEPCO's production labor costs were increased for reasons which are Government-responsible.

(R4, tab 501-C at GOV012451) Other than AEPCO's allegation, there is no proof that trade practice requires hot work be approved for 24-hour periods. The contract does not require hot work be approved for 24-hour periods.

205. AEPCO contends that since it was working 24 hours a day at the end of the job, it was unreasonable for the ship's force to require 8-hour notice before commencement of hot work. The captain testified that had he been given "some sort of schedule," the ship's force could plan ahead and sequence other work so that they could ensure hot work was not being done at the same time fiber optic cables were being pulled. Without a schedule however, he wanted AEPCO to advise "more than just some time in the next 24 hours" where it planned to do hot work. (Tr. 1779-80) Since there were numerous contractors and government agencies all working on the vessel at the same time, we do not find the ship force's request for 8-hour notice to be unreasonable. During the latter part of the availability there was only one place (fireroom) where hot work was being done. According to the captain, processing hot work chits at that time was a matter of "a couple of minutes" because the ship's force was "right there," "[a]ll the time" (tr. 1864).

206. AEPCO estimated that AEPCO lost 513 labor hours waiting for hot work authorization. It claims $26,839 for this constructive change. (R4, tab 501-C at GOV012457; app. quantum br., appendix A at 47 of 60) AEPCO's witness could not pinpoint what specific work was impacted on what dates by late hot work authorization (tr. 2131-32). No condition report was written for any alleged lost time. Allegations such as AEPCO was "often delayed for substantial periods awaiting Ship Force's action on HWRs" have not been substantiated by either contemporaneous documentation or witness testimony (finding 204).

DECISION

Because there was no contract requirement to approve HWRs for 24-hour periods, and because AEPCO has failed to prove by a preponderance of the evidence that it lost time waiting for HWRs to be processed, we hold there is no constructive change for which AEPCO is entitled to an equitable adjustment.

3. Miscellaneous Constructive Change C.14.C – Incremental Release Of Firemain Work

207. AEPCO's claim alleges:

> . . . AEPCO was not allowed to carry out its Job Order work on the Firemain as planned because the Ship's Force required AEPCO to work on only relatively small portions of the Firemain at any one time.

(R4, tab 501-C at GOV012451)

208. The firemain system runs throughout the MT. WHITNEY on all levels. While it was designed primarily for firefighting, it was also used to flush toilets "through a couple of locally positioned depressurizing valves" (tr. 1781, 2136). AEPCO's work on the firemain was to install a number of valves (tr. 2136).

209. The MT. WHITNEY had crews living onboard throughout its availability. While the vessel could accommodate AEPCO if it let SUPSHIP Portsmouth's ship's force know which sections of the firemain it wished to work on, shutting down the entire firemain would render the vessel uninhabitable. (Tr. 1781-82) RAV work is always done on an occupied ship (tr. 2639). AEPCO acknowledged that, when it bid the contract, it knew sailors would be living onboard while the work was ongoing (tr. 2138).

210. While AEPCO maintained that it planned to install the valves in sections, its original production schedule does not support its claim. That schedule shows that AEPCO planned to complete the repair/replacement of firemain valves in 39 work-days,

beginning 18 January 2000 and finishing 10 March 2000. The schedule shows this work item had six sub-activities: (1) 1D 82, Remove valve, 10-day duration, beginning 18 January 2000 and finishing 31 January 2000; (2) 1D 83, Accomplish 009-47 for gate valves, 10-day duration, beginning 24 January 2000 and finishing 4 February 2000; (3) 1D 84, Install new b'fly valves/Modify piping, 15-day duration, beginning 7 February 2000 and finishing 25 February 2000; (4) 1D 85, Reinstall gate valve, 1-day duration, beginning and finishing 24 February 2000; (5) 1D 86, Accomplish 009-11, 7-day duration, beginning 21 February 2000 and finishing 29 February 2000; and (6) 1D 87, Accomplish op-test, 8-day duration, beginning 1 March 2000 and finishing 10 March 2000. (R4, tab 105 at 4)

211. Despite AEPCO's claim to the contrary, we find no evidence that it had a viable plan to install the firemain valves in sections. Had AEPCO followed its production schedule, it would have to shut down the entire firemain for at least an extended period, a situation that it knew or should have known would not have worked with sailors living onboard the vessel. The firemain was released to AEPCO one section or one compartment at a time. Potter alleged "Instead of putting in three valves a day, I wanted to put in 10." (Tr. 2137) AEPCO has, however, failed to demonstrate that it could have put in 10 valves a day without an unacceptable period of shut down.

212. Contrary to its practice of submitting a condition report when it believed its work was being impacted, no condition report was submitted complaining about the way the firemain was released. We find that the lack of such reports indicates that AEPCO did not consider the way the firemain was released a problem at the time.

213. AEPCO estimated that AEPCO consumed 171 MHs of additional labor as a result of this alleged constructive change. AEPCO claims $9,458 for this constructive change. (R4, tab 501-C at GOV012458; app. quantum br., appendix A at 48 of 60)

DECISION

Because AEPCO has not demonstrated that it had a viable plan for installing valves in sections, and because it failed to demonstrate that the way the firemain was actually released was any more onerous than it should have anticipated for installing the valves while maintaining habitability of the vessel, we hold there is no constructive change for which AEPCO is entitled to an equitable adjustment.

4. Miscellaneous Constructive Change C.14.D – Access Route Restrictions

214. AEPCO's claim alleges:

> . . . The Ship's Force also required AEPCO's personnel to at times follow particular routes to and from certain work areas

> within the ship. Such unplanned restrictions added extra time to AEPCO's incurred labor costs.

(R4, tab 501-C at GOV012451)

215. There are two entrances into the vessel. The distance between the front and rear entrance was between 100 to 120 feet (tr. 1784). The front gangway was closest to AEPCO's lay-down area on the pier. That "would have been the gangway that would be the quickest and fastest way to get down to get the equipment from the pier and our boxes in our lay-down area and carry them up on the job site" (tr. 2121-22). Using the aft entrance was less direct and less convenient; one had to go "down a level by the ship's door, and then back up a level" (tr. 2132).

216. Because the MT. WHITNEY was a command ship, there is a command quarterdeck inside the front entrance. The command quarterdeck had "a real nice white tile floor. . . . [H]ad mats when they brought dignitaries on" (tr. 2122).

217. Only officers and senior enlisted officers were allowed to use the front entrance. According to the captain, the majority of MT. WHITNEY's crew, and "anybody that works on the ship" used the rear entrance. (Tr. 1784) AEPCO was told to use the rear entrance. Not only AEPCO, "whoever else was coming aboard, including the staff and . . . the ship's force, had to live with the same requirements." According to the captain, he was unaware of any complaints of this restriction made by AEPCO during the availability. (Tr. 1785)

218. No condition report was submitted during the course of MT. WHITNEY's availability. There is no evidence that AEPCO at the time considered using the rear entrance an impediment to its contract performance. AEPCO now contends that the restriction "cut down" its productivity because it took more time "to get on and off the vessel" (tr. 2123).

219. AEPCO estimated that AEPCO lost 257 MHs because AEPCO's workers were denied use of the front entrance. AEPCO claims $13,498 for this constructive change. (R4, tab 501-C at GOV012459; app. quantum br., appendix A at 49 of 60)

220. There is no contract provision giving AEPCO the right to use the vessel's front entrance. Because the front entrance was used for ceremony, we find it was a reasonable exercise of discretion on the part of the captain to restrict its use.

DECISION

Because there was no contract provision giving AEPCO the right to use the vessel's front entrance, and because protecting the ceremonial area of the front entrance

was a reasonable exercise of the captain's discretion, we hold there is no constructive change for which AEPCO is entitled to an equitable adjustment.

5. Miscellaneous Constructive Change C.14.E – Non-Availability of Ship's Force with Keys

221. AEPCO's claim alleges:

> . . . Although the Supervisor ordered AEPCO to accelerate its work, including requiring AEPCO to work to a non-contractual "Production Completion Date", the Ship's Force was not always available to open locked spaces and provide the other support needed during the resulting around-the-clock operations of AEPCO. As a consequence, AEPCO's workers sometimes incurred lost time awaiting Ship's Force personnel with keys to spaces, areas, etc.

(R4, tab 501-C at GOV012451-52)

222. According to the captain, since the MT. WHITNEY was the flagship of the Second Fleet, there were "a lot of areas of the ship where they kept classified or sensitive material" (tr. 1786). The regular members of the ship's force did not have keys to those spaces. Only the duty officer had a set of keys that could unlock every door. (Tr. 1865, 2124)

223. Since the duty officer did not stay in one place but moved about the vessel, AEPCO had to go to the quarterdeck to find the duty officer (tr. 2124). AEPCO's witness testified this occurred "about 15 to 20 times" (tr. 2132). We cannot find having to go to the quarterdeck to locate duty officers to have been onerous. There is no evidence that duty officers were slow or uncooperative once summoned.

224. AEPCO acknowledged that there had been instances after secured doors were opened, they were inadvertently closed by unsuspecting ship's personnel (tr. 2124).

225. Notwithstanding the fact only the duty officer had keys to secured spaces, since AEPCO knew best what work it was going to do on a day-to-day basis, we find that it should not have had difficulty in having doors unlocked if it had planned and coordinated with the duty officer in advance. Once the doors were unlocked, it would be AEPCO's responsibility to ensure that they were not inadvertently closed if it intended to continue to work in that space. Beyond having to post a fire watch when it performed hot work against a bulkhead, there is no evidence when and for how long its work was held up due to lack of access into locked spaces (tr. 2124, 1867). No condition report was submitted if work was stopped.

226. AEPCO estimated that AEPCO lost 129 MHs of productive work in trying to locate the ship's duty officers to unlock doors. If there was underlying support for the estimate, AEPCO has not provided it. AEPCO claims $6,751 for this alleged constructive change. (R4, tab 501-C at GOV012460; app. quantum br., appendix A at 50 of 60)

DECISION

Because AEPCO has not proved that it performed work beyond what was called for by the contract, we hold that there is no basis for entitlement to a constructive change.

6. Miscellaneous Constructive Change C.14.F – Late Condition Report Responses

227. AEPCO's claim alleges:

> The Supervisor was very late in answering many of the Numerous Condition Reports submitted by AEPCO. This caused labor hours to be lost by AEPCO while attempting to work around the lack of Supervisor responses.

(R4, tab 501-C at GOV012452)

228. The witness AEPCO called to establish entitlement on this claim testified that he wrote "a lot" of condition reports "on this vessel" (tr. 2133). Beyond stating that he knew "numerous" responses to his condition reports "were late," the witness provided no specifics because he had not had an opportunity "to look at each condition report" (tr. 2134).

229. Between January and July 2000, at least 183 condition reports were written (R4, tab 107). AEPCO has not organized its evidence in support of this alleged constructive change. AEPCO estimated that AEPCO lost 155 MHs attempting to work around the alleged late responses to the condition reports. AEPCO seeks $8,083, for this alleged constructive change (R4, tab 501-C at GOV 012461; app. quantum br., appendix A at 51 of 60). We cannot find AEPCO's estimate reflective of the reasonable amount of hours AEPCO spent in work-arounds inasmuch as the principle witness AEPCO called to support entitlement did not appear to know much about the details of its claim.

DECISION

Because AEPCO has failed to establish factually, by a preponderance of the evidence, that there was a constructive change, we hold that it is not entitled to an equitable adjustment.

7. Miscellaneous Constructive Change C.14.G – Incorrect/Improper Condition Report Responses

230. AEPCO's claim alleges:

> Certain AEPCO Condition Reports were answered "NAR" (No Action Required) by the Supervisor although action by the Supervisor was necessary. In several cases, AEPCO went back to the Supervisor and convinced the Supervisor to take the required action. However, such extra AEPCO action to turn the matter around was added work. In certain other instances, AEPCO was not successful in obtaining a reversal of the Supervisor's position, and AEPCO had to solve the Government-responsible problem on its own.

(R4, tab 501-C at GOV012452)

231. Beyond the general allegations stated in its claim, AEPCO provided no further details. As mentioned previously, 183 condition reports were submitted during the vessel's availability. By continuing to press this claim, AEPCO presumably expects us to comb through all of the condition reports to see whether there is support for its allegations. AEPCO has the burden of proof. We are not obligated to find the evidence necessary to support its allegations.

232. AEPCO estimates that AEPCO spent 188 MHs in solving the alleged government-responsible problems arising out of the condition reports. It claims $9,879, for this alleged constructive change. (R4, tab 501-C at GOV012462; app. quantum br., appendix A at 52 of 60) We cannot find the claim estimate fairly reflects the "extra AEPCO action" required to correct alleged incorrect or improper condition report responses inasmuch as AEPCO has not provided the underlying facts to support its claim.

DECISION

Because AEPCO has failed to establish factually, by a preponderance of the evidence, the basis for constructive change, we hold that it is not entitled to an equitable adjustment.

8. Miscellaneous Constructive Change C.14.H – Planning Yard Delays

233. AEPCO's claim alleges:

> . . . [T]he Government's ShipAlt drawings were not work-proven. They contained errors and required AEPCO to seek clarification. The Supervisor was generally responsive, but it often had to obtain answers from the Government's Planning Yard. The added time awaiting answers to these non-AEPCO responsible problems caused lost time and reduced efficiency on the part of AEPCO's workers, and it is compensable.

(R4, tab 501-C at GOV012452-53) AEPCO cites Condition Report Nos. 19, 27, 43, 46, 53, 54, 60, 64 and 120 as instances where it lost time and efficiency due to planning yard delays.

234. On 25 January 2000, AEPCO submitted Condition Report No. 19 recommending removal of certain interferences with the installation of new bulkheads discovered after layout. After consulting the planning yard, SUPSHIP Portsmouth responded on 6 February 2000—12 days later—approving AEPCO's recommendation. (R4, tab 107 at Condition Report No. 19; tr. 2153)

235. On 31 January 2000, AEPCO submitted Condition Report No. 27 recommending certain access cuts be made to bring the MFPs into the vessel. The ship surveyor denied AEPCO's recommendation on the same day. (R4, tab 107, Condition Report No. 27) On 7 February 2000—7 days later—SUPSHIP Portsmouth issued Sequence No. 13G agreeing to compensate AEPCO (R4, tab 27). Sequence No. 13G was a part of bilateral Modification No. 1F, under which the parties agreed to a "full and final settlement of all claims arising out of . . . change orders indicated above." Sequence No. 13G paid AEPCO $21,000 and was one of the five changes listed. (R4, tab 97)

236. On 3 February 2000, AEPCO submitted Condition Report No. 43, stating that it was unable to locate item # V-3 with a part or SH number. On 7 February 2000—four days later—SUPSHIP Portsmouth forwarded the information requested. (R4, tab 107, Condition Report No. 43) AEPCO acknowledged that but for the fact that the item related to the MFPs it would not otherwise argue about a four-day turnaround (tr. 2156-57).

237. On 4 February 2000, AEPCO submitted Condition Report No. 46, requesting several drawings. On 9 February 2000—five days later—SUPSHIP Portsmouth forwarded the requested drawings. (R4, tab 107, Condition Report 46) Pending receipt

of the drawings, AEPCO reassigned its workers. It alleges that once the drawings were received, it "probably" resulted in working overtime (tr. 2157-58).

238. On 8 February 2000, AEPCO submitted Condition Report No. 53 seeking commissary space details. SUPSHIP Portsmouth responded on 10 February 2000—two days later—stating "NAR: Drawing provided, see report 46." (R4, tab 107, Condition Report No. 53) AEPCO asked for the same information twice, once on 4 February 2000 through Condition Report No. 46, and again on 8 February 2000 through Condition Report No. 53 (tr. 2160).

239. On 8 February 2000, AEPCO submitted Condition Report No. 54 seeking Drawing No. 593-6960345 (large pulper control valve assembly) because it did not have enough information to fabricate or purchase piece no. F66 of reference 2q. SUPSHIP Portsmouth provided the drawing on 22 February 2000—14 days later. (R4, tab 107, Condition Report No. 54)

240. On 9 February 2000, AEPCO submitted Condition Report No. 60 recommending certain work be done in connection with the LP drain piping (R4, tab 107, Condition Report No. 60). SUPSHIP Portsmouth initially responded on 10 February 2000 taking the position that the work was AEPCO's responsibility. SUPSHIP Portsmouth subsequently changed its mind and issued Sequence No. 24G on 15 February 2000 (tr. 2162). Bilateral Modification No. 1C settled all claims arising out of Sequence No. 24G for $1,300 including delays and disruptions (R4, tab 94; *see AEPCO*, 03-1 BCA at 158,985, ¶ 9).

241. On 11 February 2000, AEPCO submitted Condition Report No. 64 seeking assistance from SUPSHIP Portsmouth to obtain a cooling coil in the Navy's stock system to avoid a one-month delivery time. SUPSHIP advised on 22 February 2000—12 days later—that it could not locate either a 57 DW or 67 DW cooling coil in its stock system. (R4, tab 107, Condition Report No. 64) AEPCO has not shown if and how it ultimately obtained the cooling coil (tr. 2164). There is no proof that AEPCO's workers lost time and efficiency waiting for a response from SUPSHIP Portsmouth.

242. On 4 March 2000, AEPCO reported suspected asbestos in the lagging in the overhead of MFP - B. AEPCO immediately taped up the area in question. A sample of the area was analyzed and confirmed to be asbestos. On 22 March 2000, over two weeks later, AEPCO submitted Condition Report No. 120 recommending removal of the asbestos "between the DFT and A, B, and C main feed pump." (R4, tab 107, Condition Report No. 120) Apparently, AEPCO kept running into asbestos in the MFP area and wanted to remove it. Based on SUPSHIP Portsmouth's 24 March 2000 direction to comply with Standard Item No. 009-10, however, AEPCO continued to encapsulate the asbestos. (Tr. 2167-68) AEPCO has not shown how this condition report caused it to lose time and efficiency.

243. In connection with answering condition reports, AEPCO acknowledged that five days would be reasonable. Potter admitted that AEPCO often proceeded on the basis of verbal approval and did not wait for a response. (Tr. 2173) Moreover, the evidence shows if AEPCO needed a drawing to continue, the worker involved would work on something else until the drawing was obtained (tr. 2177). Notwithstanding the fact that he "was on the ship quite a bit" (tr. 2877), Potter professed he was unable to quantify the "work arounds" and had to rely on experts (tr. 2174).

244. AEPCO estimates that AEPCO lost 129 MHs waiting for SUPSHIP Portsmouth to respond to its various condition reports. AEPCO seeks $6,884 for this alleged constructive change. (R4, tab 501-C at GOV012453, 012463; app. quantum br., appendix A at 53 of 60) There is no showing that the amount claimed bears any relationship to the actual amount of time and efficiency lost.

DECISION

Under this constructive change, AEPCO cited a number of incidents, not all relating to shipalt drawings, where it allegedly lost time and suffered inefficiency because SUPSHIP Portsmouth did not respond to its condition reports immediately. Beyond what it stated in its condition reports, AEPCO added little to support its allegations. Based on our review of the evidence, we conclude that SUPSHIP Portsmouth responded quickly in most instances. Even in situations where responses could be argued to be less than prompt, AEPCO has not shown that it in fact lost time and efficiency. Nor has AEPCO shown that the estimated amounts claimed bear any relationship to the time and efficiency allegedly lost. We hold AEPCO has failed to prove entitlement to a constructive change.

9. Miscellaneous Constructive Change C.14.I – Government-Responsible Work Interferences

245. AEPCO's claim alleges:

> The Government contracted with others to perform industrial work on MOUNT WHITNEY concurrently with AEPCO's performance of the Job Order. The Government did not require such other work to be done on a not-to-interfere basis with AEPCO's Job Order work. (The Ship's Force and other Government entities also contributed to this problem.) As a result, certain Job Order work being done by AEPCO and/or its subcontractors required more manhours to perform. Such interference is compensable.

(R4, tab 501-C at GOV012453)

246. AEPCO's witness testified that his work was (1) impeded by a deck contractor who was chipping up and putting down underlayment and deck tiles in the area adjacent to the quarterdeck, (2) slowed down by an electrical contractor using a conveyor to bring up its gear adjacent to the solid waste pulper, and (3) stopped in the fan room everytime the captain had a meeting (tr. 2180-81).

247. With respect to the deck contractor, AEPCO's witness did not know when the alleged interferences took place except that they lasted "at least a week's time" (tr. 2183). With respect to the electrical contractor, AEPCO's witness did not know the dates the alleged interferences occurred, did not know the amount of time he lost in performing waste pulper work, and did not write a condition report of the interfering incident. He testified the interference lasted "at least a couple of days" (tr. 2183-84). Given that AEPCO submitted extensive contemporaneous condition reports in other situations where it believed its work was affected or delayed, we find the lack of any documentary evidence of the alleged interferences and the uncertainties of the witness' testimony render AEPCO's proof less than credible. Moreover, AEPCO had no exclusive right to the common areas of the vessel.

248. With respect to having to stop work in the fan room when the captain held meetings, AEPCO's witness testified that such meetings did not take place every day but they occurred "numerous times during the week" (tr. 2184). AEPCO's witness called to testify stated that he did not know the dates and times work was stopped in the fan room, and for how long AEPCO's work was impacted (tr. 2184-85).

249. AEPCO estimates that it spent 257 MHs and claims $13,766 for this alleged constructive change. (R4, tab 501-C at GOV012464; app. quantum br., appendix A at 54 of 60) The factual bases on which AEPCO based the amount of its estimate are not explained.

DECISION

We have found there were no interferences with AEPCO's work in the fire room from either NORSHIPCO or the ship's force (finding 116). On the basis of the evidence before us, we conclude that AEPCO has not proved by a preponderance of the evidence that its waste pulper work was interfered with by the decking or electrical contractor. Moreover, even though its work in the fan room was occasionally stopped because of the captain's meetings, AEPCO has failed to prove how the amount it claimed bore any relationship to its work stoppages. We hold AEPCO has failed to prove entitlement to a constructive change.

Constructive Change C.15 – Ship's Force Interference With Duplex Strainer Work

250. Item No. 262-10-001 of Job Order No. 0072 required AEPCO to install lube oil strainer shields (R4, tab 2 at ACO06513). AEPCO's 12 January 2000 production schedule shows it planned to start this item on 12 January 2000, and to finish the item on 18 January 2000 (R4, tab 512 at GOV00431; tr. 2195).

251. At 7:30 a.m., 13 January 2000, AEPCO began to remove the duplex strainer shield. It was stopped by "MM2 Stafford" of the ship's force due to an inspection that was to take place the next day, 14 January 2000. MM2 Stafford advised AEPCO that AEPCO could resume work after "1000 hours on 01/14/00." On 13 January 2000, AEPCO submitted Condition Report No. 5, recommending that it be compensated for "the following delays on 01/13/00 from 0730 to 1030 hours" for three hours for one supervisor, one leadman and two laborers. (R4, tab 107, Condition Report No. 5, tr. 2189) Based on the evidence in the record, we find that AEPCO's work was suspended for 12 MHs on 13 January 2000.

252. Project manager Dale wrote the following note on Condition Report No. 5 on 14 January 2000: "N.A.R. As Per phone con with Cameron Potter" (R4, tab 107, Condition Report No. 5). The duplex strainer shield was removed on 18 January 2000 (R4, tab 107, Condition Report No. 7).

253. The parties are in sharp disagreement as to what this note meant. Project manager Dale testified that he "had no problem with the hours or delay" claimed (tr. 2199). He testified he did not want AEPCO to mention the name MM2 Stafford because "[w]e did not want to start off on an adversarial relationship with the ship" (tr. 2198). He testified that Potter was to resubmit the condition report with the hours but with the name deleted. And since AEPCO never resubmitted the condition report, no sequence was ever issued. (Tr. 2200) Potter testified that Dale never told him to resubmit the condition report or he would have done so (tr. 2201). He testified that Dale did not want to upset the captain of the ship with "a lot of delay reports" and they agreed that no delay reports would be submitted and Dale would "take care of them at the end of the job, or we would work them in [in] the sequences" (tr. 2190-91).

254. AEPCO's estimates that it lost 22 MHs (as opposed to 12 MHs claimed in its condition report) in suspending work on the duplex strainer shield on 13 January 2000. AEPCO claims $961 for this constructive change. (R4, tab 501-C at GOV012466-67; app. quantum br., appendix A at 55 of 60)

DECISION

Unlike most of its other constructive change claims, AEPCO has given us more to work with on this claim. On the same day its work on the lube oil strainer shield was halted, it submitted a condition report seeking 12 MHs in lost time. SUPSHIP Portsmouth's project manager testified that he did not have any problems with the hours claimed. We have found that AEPCO's work lost 12 MHs on 13 January 2000. Although AEPCO's claim sought 22 MHs among other costs, no support for the amount estimated has been given.

Because AEPCO has proved, by a preponderance of the evidence, that work on the lube oil strainer shield was halted on 13 January 2000, and because it has proved it lost 12 straight time MHs as a result of the suspension, we hold it is entitled to an equitable adjustment.

PART III.

Post CCD (26 March 2000) Availabilities

255. The one-liner for 27 March 2000 indicated "SPLIT AVAILABILITY TO BE ESTABLISHED!" (R4, tab 103 at 3/27/00). The one-liner for 28 March 2000 indicated that NORSHIPCO had satisfactorily welded the last four butt welds (R4, tab 103 at 3/28/00). The one-liner for 29 March 2000 reported that "BOILERS ARE LIT-OFF, STM PLANTS IS ON-LINE; SPLIT AVAILABILITY TO BE ESTABLISHED" (R4, tab 103 at 3/29/00). By message dated 29 March 2000, SURFLANT confirmed to SUPSHIP Portsmouth that a no-cost RAV for the MT. WHITNEY is established for the period 15 to 30 April 2000 in order to complete the LLTM valve work (R4, tab 141 at 001074). ACO Stroud, however, never followed up and established a split-availability for installation of the LLTM firemain valves SURFLANT apparently believed was warranted. The one-liner for 30 March 2000 indicated that the MT. WHITNEY was at sea trials (R4, tab 103 at 3/30/00). The vessel returned from sea trials to Pier 10 at NOB on 1 April 2000 (R4, tab 103 at 3/31/00, 4/04/00).

256. The one-liner for 4 April 2000 reported that MT. WHITNEY had returned from sea trials and was docked at Pier 10 at NOB. It also indicated that a hit list[22] had been submitted to AEPCO for correction and that a corrective-work availability was being considered prior to the start of split availability. (R4, tab 103 at 4/04/00) The one-liner for 6 April 2000 reported that AEPCO was working on its hit list and "CORRECTIVE WORK AVAILABILITY IS FROM 02 APRIL THRU 10 APRIL, 2000" (R4, tab 103 at 4/06/00).

[22] A hit list is a discrepancy list (tr. 2356).

257. Confirming a conversation between Potter and ACO Stroud on 31 March 2000, CO C. E. Kemp advised AEPCO by letter dated 7 April 2000 that "a discrepancy still exists on the USS MOUNT WHITNEY," and that a "corrective work availability has been established from April 2, 2000 through April 10, 2000" to allow AEPCO to complete as warranty work the discrepancy relating to the turbine trip throttle of the ship service diesel generator (SSDG) (Specification Item 311-11-001) (R4, tab 147; tr. 2417).

258. The one-liner for 9 April 2000 reported that AEPCO was still working on its hit list, and a production schedule centered on completing the hit list and remaining work during the upcoming availability from 15 to 30 April 2000 would be submitted (R4, tab 103 at 4/09/00). The one-liner for 10 April 2000 reported that AEPCO plans to complete that afternoon a production schedule for completing the hit list and remaining work when the vessel returns. The one-liner indicated that MT. WHITNEY departed at 0900 hours, 10 April 2000. (R4, tab 103 at 4/10/00)

259. On 12 April 2000, AEPCO submitted to SUPSHIP Portsmouth Condition Report No. 170, a 7-page bar-chart schedule listing numerous deficiencies that had to be corrected (R4, tab 107, Condition Report No. 170; tr. 2259, 2407). The items to be corrected were developed from the hit list SUPSHIP Portsmouth provided on 4 April 2000 (tr. 2408). The schedule shows while most of the deficiencies could be corrected in a period from a week to 2 ½ weeks, the entire correction period would last 20 days, starting 11 April 2000 and completing on 30 April 2000 (R4, tab 107, Condition Report No. 107; tr. 2408). AEPCO has not taken exception to the hit list discrepancies or asserted that they could have been corrected prior to the CCD but for Navy-caused delays. The schedule shows that completing the large solid waste pulper would require 20 days or up to 30 April 2000 (R4, tab 107, Condition Report No. 170 at 5, Item No. 75).

260. AEPCO "had a lot of people standing by" between 30 March and 15 April 2000. It did not let people go because it knew it still had to finish work on the vessel. (Tr. 2256) Their MHs were charged to overhead, Job Order No. 0072, or some other jobs (tr. 2329-30).

261. The one-liner for 13 April 2000 reported "SPLIT AVAILABILITY IS 14 THRU 30 APRIL, 2000." It also reported that the vessel had returned to Pier 10 and production would begin the next day. It stated that AEPCO's production schedule comprising hit list and remaining work was on its way. (R4, tab 103 at 4/13/00) The one-liner for 16 April 2000 reported that AEPCO continued to correct the hit-list discrepancies (R4, tab 103 at 4/16/00). The one-liner for 25 April 2000 reported that "'HIT-LIST DESCREPANCY' [sic] CORRETION CONTINUES; APPROXIMATELY 105 OF 242 ITEMS RECORDED-OTHER ITEMS COMPLETED; KTR STRONGLY ADMONISHED TO COMP LIST" (R4, tab 103 at 4/25/00). Project manager Terry Seigler (Seigler), who took over from project manager Dale on 31 March 2000 (tr.

2393-94, 2401), testified that AEPCO left a small amount of discrepancy work when the vessel sailed, and they were corrected during the vessel's next availability (tr. 2408-09).

262. The 14 to 30 April 2000 availability during which AEPCO was allowed to perform corrective work on Job Order No. 0072 coincided with the split availability SUPSHIP Portsmouth gave AEPCO in connection with Job Order No. 0089 for it to overhaul the lube oil purifier (*see* finding 142, Constructive Change C.6).

263. On a RAV, because of a vessel's sailing commitment, a CO normally does not have flexibility to grant a contract time extension for excusable causes (tr. 2212). Two alternatives are available: (1) accelerate performance to meet the sailing date or (2) establish a split availability. Establishing a split availability is equivalent to granting a contractor an excusable time extension (tr. 2358). On the other hand, a corrective-work availability is not compensable because the contractor was supposed to have corrected deficient work within the availability established by the original contract. Normally, a split-availability is established by modification whereas a contractor is notified of a corrective-work availability by letter (tr. 2366, 2403).

264. In this case, notwithstanding the one-liner statements, ACO Stroud testified as far as he was concerned, there was never a split-availability established for Job Order No. 0072 (tr. 2343, 2345, 2347, 2360). He testified he discussed with Potter about completing AEPCO's incomplete work and correcting its deficient work during the split-availability for Job Order No. 0089, but no additional time would be given for Job Order No. 0072 (tr. 2361).

265. On 30 April 2000, ship surveyor Hunt executed a SUPSHIP Portsmouth form entitled "CERTIFICATE OF COMPLETION AND ACCEPTANCE OF WORK" (certificate of completion). The certificate shows it was for "Original Work" for (1) the job order performance period of 12 January 2000 through 26 March 2000, and the split-availability period of 15 through 30 April 2000,[23] and (2) it was for work up through Sequence No. 64G. The certificate of completion, signed by Hunt, states:

> Work started on 12 January, 2000 . . . was completed on 30 April, 2000 . . . at 1900 (time). The items of work and all requirements of this Job Order, as authorized . . . have been performed by AEPCO, INC. on all subject vessel and have been satisfactorily completed, including all Quality Assurance and other documentation requirements, with the following exceptions . . . .

[23] Ship surveyor Hunt was apparently under the impression that AEPCO had been or would be given a split-availability of 15-30 April 2000 under Job Order No. 0072.

(R4, tab 272) Six items were listed in the Incomplete Work/Discrepancy List. Three of the items listed pertained to the large solid waste pulper. One of the items pertained to five firemain valves[24] not having been installed. (R4, tab 273)

266. We find that AEPCO did not substantially complete Job Order No. 0072 until 30 April 2000 because it had to perform corrective work which was its responsibility, and because it had to complete contract work which had to be deferred during the vessel's original availability. Work had to be deferred so that AEPCO could apply its resources to overcome the delays occasioned by its failure to recognize that RT was a part of its contract requirements, and by the need to rework rejected weld joints.

267. The one-liner for 2 May 2000 indicated the vessel was at sea (R4, tab 103 at 05/02/00; tr. 2368). The one-liner for 4 May 2000 indicated that the vessel was back in port and the hit list corrections in the certificate of completion were expected to be completed with work starting the next morning (R4, tab 103 at 05/04/00).

268. Exhibit 2024 summarizes AEPCO's time card charges for the various work items performed on MT. WHITNEY. This exhibit shows that (1) after 30 March 2000, 75 non-exempt MHs[25] were charged to the MFPs, with the last 8 MHs charged on 29 April 2000, and (2) the bulk of the non-exempt MHs – 2179 – were charged to the solid waste pulper, with the last 37 MHs charged on 6 May 2000. (Ex. 2024[26])

269. AEPCO pipe superintendent's log of 6 April 2000 indicated that two temperature-regulating valves needed to complete the waste pulper (supposed to have been finished 23 March 2000) were not ordered as of that date (R4, tab 559 at ACO08137; tr. 2559, 2570, 3254). AEPCO's Material Status Report indicates that VALVE 1-1/4" TEMP REG UESB D26 (the D26 valve) was not ordered until 21 April 2000, and it was received the next day, 22 April 2000 (ex. 2003, tab S-7 at 35). The report also indicates that VALVE TEMP REG E-10 (the E-10 valve) was not ordered until 3 May 2000, and it was received the same day (ex. 2003, tab S-7 at 36). Both valves were obviously not LLTM. In the case of the D26 valve, it could not have been installed until after 22 April 2000. In the case of the E-10 valve, it could not have been installed until after the vessel was made available to AEPCO on 4 May 2000. (Tr. 2568-72)

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[24] Actually, there were seven, not five, firemain valves. Potter testified they had not "come in yet." (Tr. 2271)

[25] AEPCO had two kinds of employees: (1) exempt employees who were salaried and were not paid for overtime, and (2) non-exempt employees who were paid by the hour and for overtime (tr. 2678).

[26] Ex. 2024 also appears as ex. 2003, tab Q-6 (Cummings' expert report).

270. The one-liner for 7 May 2000 reported "'HIT-LIST' CORRECTIONS ARE COMPLETE WITH THE EXCEPTION OF THOSE WHICH REQUIRE LARS/ADDITIONAL SHIP-ALT FUNDING." The same one-liner stated "JOB WAS EXTENDED FOR CORRECTIONS; COMPLETED BY COB SAT, 05/06/00." (R4, tab 103 at 05/07/00) We find the work AEPCO performed during 4 to 6 May 2000 was attributable to its failure to order the E-10 valve until 3 May 2000, and to correction of deficiencies, neither of which was caused by the Navy.

271. Exhibit 2024 shows that, after 1 June 2000, 43 non-exempt MHs were charged on 9 June 2000, 8 MHs were charged on 12 June 2000, 14 MHs on 13 June 2000, and 14 MHs on 14 June 2000 to MT. WHITNEY's general account (2419-003) and an unidentified account (ex. 2024; tr. 2925). The last day AEPCO charged work to the MT. WHITNEY job order was 15 June 2000 (ex. 2024).

272. On 26 June 2000, SUPSHIP Portsmouth issued Sequence No. 76G deleting the installation of seven firemain valves and instructed AEPCO to "TURN OVER TO THE SHIP'S FORCE UPON RECEIPT FROM VENDOR" (R4, tab 89; tr. 3234-35). AEPCO maintains that it was under the impression that the firemain valves still had to be installed, and it had to maintain a readiness for that eventuality until 26 June 2000 (tr. 2380). AEPCO has not shown that it in fact ordered the seven firemain valves. Its Outstanding Material Status Reports do not list the valves as having been ordered (R4, tabs 516, 517). Without showing that it in fact timely ordered the firemain valves, we cannot attribute any delays in their delivery to the Navy.

273. Subsequent to Sequence No. 64G covered by the 30 April 2000 certificate of completion, SUPSHIP Portsmouth issued 13 more sequences (65G, 66G, 67NG, 68G, 69G, 70G, 71G, 72NG, 73G, 74G, 75G, 76G, and 77G). Some of the sequences added work. Others, such as Sequence Nos. 72NG, 74G and 76G, deleted work. ACO Stroud testified that "a lot of . . . work . . . that they had accomplished already . . . did not have a sequence" (tr. 2350). AEPCO agrees "the sequences were largely performed before they were issued" (tr. 2811). Absent evidence of when work called for by these sequences issued after Sequence No. 64G was actually performed, we are unable to find that SUPSHIP Portsmouth continued to order work on changes after AEPCO completed correction of the hit list items on 6 May 2000.

274. No liquidated damages were assessed against AEPCO (tr. 1454-56).

Compliance With Standard Item No. 009-60

275. Among the Standard Items AEPCO was required to comply with was Standard Item No. 009-60, "Schedule and Associated Reports; provide." This Standard Item required AEPCO to:

3.2 Prepare and provide a production schedule to the SUPERVISOR . . . no later than 15 days prior to start of the availability. The production schedule shall establish an orderly and systematic overhaul program that reflects the manner in which the project will be performed. Schedule shall be inclusive of milestones and key events.

3.2.1 Schedule each Work Item to the activity level which shall list the start and completion dates for each activity in sufficient detail that can be measured toward each milestone.

. . . .

3.2.3 Schedule shall identify the critical path and controlling work items within the Job Order.

3.2.4 Identify the amount of total float available on each Work Item activity based on a five day work week unless otherwise specified. Show each early and late start and finish date.

3.2.5 The Production Schedule shall be revised weekly to include additions, deletions, modifications, progress, and completions.

3.2.5.1 Submit . . . the Production Schedule to the SUPERVISOR one day prior to the weekly progress meeting.

3.2.6 Submit . . . the production schedule to the SUPERVISOR in accordance with the requirements of 3.2.

3.3 Prepare a time-oriented work package network that displays critical path Work Items and controlling Work Items, milestones, key events, and Work Items that interrelate with controlling Work Items. Display critical path and controlling Work Items at the activity level.

. . . .

3.3.4 Submit . . . the network to the SUPERVISOR in accordance with the requirements of 3.2.

3.3.5 Revise the network weekly in support of the weekly production schedule revisions of 3.2.5.

(R4, tab 574 at ACO07052-54)

276. Paragraph 3.1.2 of Standard Item No. 009-60 defines "Activity" as:

> A portion of an individual Work Item which is a logical subdivision of the Work Item representing a manageable unit of work which must be accomplished at a specific period of time *in relation to other activities* of the Job Order.

Paragraph 3.1.4 defines "Key Event" as "An event which, if slippage occurs, could impact or delay the overall schedule." Paragraph 3.1.6 of Standard Item No. 009-60 defines "Critical Path" as:

> That sequence of activities which forms the longest duration, and directly affects the completion of the availability. Factors in determining critical path are: time duration required for the activity, *space limitations, manpower available, and the interface between Work Item activities.*

Paragraph 3.1.1 of Standard Item No. 009-60 requires that the production schedule constructed in accordance with the foregoing requirements be used by "contractor and subcontractor personnel *as a means of planning, tracking, and coordinating the accomplishment of contract work."* (Emphasis added) (R4, tab 574 at ACO07052) As Cummings, the Navy's scheduling expert explained, "[t]he reason for the CPM schedule is to show the causal relationships of changes on the plan [sic] performance" (tr. 3922).

277. The production schedule AEPCO submitted on 12 January 2000 was a bar chart schedule based on "Microsoft Project" (tr. 2894). It was not done as a CPM network schedule because there were no "logic connections" of the work items or activities (tr. 2895-96). Also, the schedule was not logically tied to AEPCO's manpower resources or to material availability (tr. 2899). Nor did the schedule identify float as required by ¶ 3.2.4 of Standard Item No. 009-60. Cummings explained the concept of float:

> A critical path methodology depends upon the logical relationships between activities in determining the early dates, the dates by which it can be accomplished and the dates by which is [sic] must be accomplished, the difference being

> float. . . . [Y]ou can't get to the float calculation unless you tie the whole network together.

(Tr. 3138)

278. There is no documentary evidence that AEPCO updated its production schedule or CPM network as required by ¶¶ 3.2.5, 3.2.5.1 and 3.3.5 of Standard Item No. 009-60. Ship surveyor Hunt testified AEPCO was supposed to update its schedule once a week but he received updates "when they were able to update them" (tr. 921-25). With no record, it is not known how frequently AEPCO updated its bar chart schedule and in what format.

279. AEPCO acknowledged that its production schedule was "simply a bar-chart representation of the timing of individual work items," and it was not resource loaded (tr. 2666). It contends that establishing logic ties and resource loading were not necessary because the MT. WHITNEY job was planned as a "level load" project under which it did not have to vary its work force because the work was "a series of basically unrelated jobs" (tr. 2873).

280. We do not find this justification persuasive. When an unanticipated event occurred—such as the requirement to RT or rework P-1 piping—and AEPCO was forced to deviate from its original plan to divert manpower from one work item to another, a properly scheduled and updated CPM would have been able to demonstrate the precise impact the work had on the overall project. Likewise, including LLTM required dates in the CPM would have pinpointed the precise impact to the CCD if any LLTM were delivered late (tr. 2935). Moreover, the only way to determine whether there was interference in a space was to have a resource-loaded schedule that showed what resources were demanded by the specification item on any particular day (tr. 3144).

281. Providing and updating a CPM schedule meeting the requirements of Standard Item No. 009-60 would have been expensive (tr. 2588-89). In this case, AEPCO shortchanged the Navy by providing something far less, and the Navy did not insist on full compliance (tr. 2896, 3146). Nonetheless, we find that AEPCO's failure to fully comply with Standard Item No. 009-60 left it with an inability to demonstrate what impact occurred as a result of the various Navy actions it now alleges to have occurred. We find also that, had it submitted and updated a "resource loaded" CPM showing the labor allocated to the performance of each scheduled work activity, as ¶ 3.1.6 of Standard Item No. 009-60 required, AEPCO could have tracked disruptive impact through the schedule.

282. Even though the software package it used to prepare its bar chart schedule was capable of performing an as-built CPM analysis (tr. 3134), AEPCO also provided no such analysis to support its claim. AEPCO's scheduling expert, Charles L. Willis

(Willis) acknowledged that CPM is useful in claims analysis "because you can determine the interrelationships and logic that tie the various steps of a project together; and, then, insert causes of delay into that analysis and produce a projected impact on the completion date" (tr. 2589).

AEPCO's Proof Of Acceleration, Delay, And Disruption

283. According to Potter, AEPCO originally planned to complete Job Order No. 0072 working 8 hours a day, 5 days a week, during the 75-day availability (*see* finding 15). Under this plan, AEPCO could use weekends and overtime to incorporate new and growth work. (Tr. 2211-12)

284. Potter believed that when the Navy first imposed the PCD, that date (13 March 2000) could be met with overtime. AEPCO, however, did not anticipate the work rendered necessary by RT. With that work, AEPCO was forced to work 12-hour days, and finally two 12-hour shifts. In addition, AEPCO had to hire "a lot of temporary help." (Tr. 2213-14) We find the need to hire temporary labor arose not as a result of imposition of the PCD, but as a result of the work associated with RT of the P-1 pipe welding.

285. Even with that effort, AEPCO did not meet the PCD (13 March 2000). Nor did it finish all of its work by the CCD (26 March 2000) (tr. 1496, 2215). Inasmuch as the vessel was able to go to sea trials on 30 March 2000, we find AEPCO successfully completed work in the machinery space on or about 29 March 2000.

286. SUPSHIP Portsmouth's biweekly progress reports, also known as In-Plant Availability Reports (IPARs) on the MT. WHITNEY listed six work items as controlling jobs of the project. These work items included (1) MFP replacement, (2) encapsulated lifeboat installation, (3) large solid waste pulper installation, (4) metal/glass shredder installation, (5) SSDG valve work, and (6) sanitary space habitability upgrades. (R4, tab 104)

287. Based on the IPARs, AEPCO developed a series of graphs depicting the status of completion of the MFPs, large solid waste pulper, metal/glass shredder, SSDG, and the fire main valves as of PCD and CCD (R4, tabs 296-301). We are doubtful whether the IPARs truly measured progress because they were not based on individual work item completion, but were based on a "milestone estimate technique" where "arbitrary percentages" were assigned for payment purposes (tr. 3178).

288. On installation of the MFPs, AEPCO's 12 January 2000 schedule shows 24 March 2000 as the completion date (R4, tab 105 at 14; tr. 2317). AEPCO's graph shows work on the MFPs began on time. Work on the MFPs was more or less on schedule until about 8 February 2000 when the RT issue surfaced. Work went nowhere

for the next two weeks until about 22 February 2000. Work then steadily progressed for the next three weeks until mid-March 2000. It went through a steep climb during the last two weeks until sea trials on 30 March 2000. Work was about 75% complete as of PCD and about 95% complete as of CCD. (R4, tab 299)

289. On the large solid waste pulper, AEPCO's 12 January 2000 schedule shows it was supposed to begin on 12 January 2000 and complete on 23 March 2000 (R4, tab 105 at 6; tr. 2316). AEPCO did not start until 18 January 2000 (tr. 2232). According to AEPCO, it could not start right away because it could not rip out the deckhouse exterior until it put up the proper protective tarps, and it had to "knock off numerous times" to accommodate dignitaries coming on and off the quarterdeck area[27] (tr. 2507). AEPCO's graph shows that as of the CCD, AEPCO was about 90% complete on this work item (R4, tab 297). According to Potter, AEPCO was unable to accelerate on this item because of problems relating to LLTM and because pipefitters and welders were pulled off of the waste pulper in late February 2000 to work on the MFPs (tr. 2233, 2511).

290. On the metal/glass shredder, AEPCO's 12 January 2000 schedule shows 23 March 2000 as the completion date (R4, tab 105 at 6; tr. 2317). AEPCO's graph shows it began work on this item on time on 12 January 2000 (R4, tab 298). As of the CCD, work was about 90% complete (*id.*). The graphs shows AEPCO fell behind schedule in January 2000 because of "some new material problems" and because it was "probably using the labor somewhere else" (tr. 2238). According to Hill, he was delayed in the beginning because he was unable to use the area around the quarterdeck, and although he was able to catch up in the middle of February 2000, he lost ground again because his welders were diverted to work on the MFPs (tr. 2514).

291. AEPCO's contract work also included the overhaul of two steam emission valves on the SSDG. AEPCO's 12 January 2000 schedule shows that work was supposed to begin 18 January 2000 and to complete 6 March 2000. (R4, tab 105 at 3; tr. 2243-44, 2318) Even though this item was supposed to have been completed before the PCD, as of the PCD, the work was roughly 95% complete (R4, tab 300). Work on the SSDG was "very erratic." The valves could not be tested until the MFPs were finished. AEPCO had to pull the valves twice to adjust them. (Tr. 2244-45) There is no proof that SUPSHIP Portsmouth was responsible for the required adjustment.

292. AEPCO did not provide a graph on the encapsulated lifeboat installation and the sanitary space habitability upgrades; instead it provided a graph on the firemain installation. On the firemain valves, AEPCO's 12 January 2000 schedule shows the work would begin on 18 January 2000 and complete on 10 March 2000 (R4, tab 105 at 4).

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[27] AEPCO was compensated for the delays experienced when dignitaries visited the ship through Sequence Nos. 49G, 50G and 51G. These three sequences were a part of bilateral Modification No. 1K (*see AEPCO*, 03-1 BCA at 158,985, ¶ 16).

AEPCO did not begin work until 24 or 25 January 2000 (R4, tab 301). The reason for the delay was "[e]ither long lead time material or the ship wouldn't shut the system down" (tr. 2250). AEPCO was 70% complete on this item on PCD. No progress was made, and the work was still 70% complete by CCD (R4, tab 301).

293. To enable the vessel to be able to go to sea trial sailing, AEPCO put its resources on the MFPs and "starved" or diverted resources away from other work items such as the large solid waste pulper and the metal/glass shredder. The MFPs were considered more deserving because the vessel could leave port without completing the solid waste pulper or the metal glass shredder whereas it could not leave port without completing the MFPs. (Tr. 2215-16, 2309)

294. We do not find AEPCO's analyses in support of its delay and impact claims helpful. For one thing, they undermine AEPCO's own argument that the job order was merely "a series of unrelated jobs"; when AEPCO "starved" or deferred some work items in order to put resources on the MFPs, it demonstrated that unrelated work can, and in fact did, impact each other. Secondly, its analyses made no effort to separate out Navy-caused delays that are foreclosed by bilateral modifications. Because its analyses did not tie the entire project together and eliminate those causes that are not recoverable, we are left without a clear sense of who caused the overall completion of the job order to be delayed, and to what extent.

295. Potter testified that other than the work encompassed by butt welds of the three MFPs, the other contract changes had "minimal" effect on AEPCO's ability to meet the contract schedule. He described "the x-ray on the main feed pump pipe" as "the killer." (Tr. 2216-17)

296. In support of its impact claim, AEPCO moved into evidence a chart entitled "USS MT. WHITNEY (LCC-20) LABOR HOURS BY WEEK" (R4, tab 302). The chart shows that AEPCO originally intended to perform Job Order No. 0072 over an 11-week period from 12 January to 26 March 2000. Based on "[c]ompany time sheets" the chart shows that AEPCO actually performed the job order over an 18-week period from 12 January to 14 May 2000. (R4, tab 302; tr. 2281) According to AEPCO, the 22,802 MHs it bid would have been spread over the original 11-week performance period evenly with roughly 2,100 MHs per week (tr. 2283-84, 2331-32).

297. AEPCO's manpower analysis chart shows that it worked less than 1000 MHs during the first two weeks. During the third and fourth weeks, it ramped up to around 2000 MHs. During the fifth through the eighth weeks (6 February to 5 March 2000), it increased its MHs steadily from 3,000 to 3,500 MHs. It started hiring temporary workers steadily beginning 5 March 2000. During the 9th (5 March 2000), 10th (12 March 2000), 11th (19 March 2000), 12th (26 March 2000) and 13th (2 April 2000) weeks, it worked roughly 4,100, 5,000, 6,600, 5,300, 2,400 MHs respectively. From the 14th (9 April

2000) to the 18th week (7 May 2000), AEPCO worked 1,000 to 2,000 MHs each week. (R4, tab 302)

298. Because AEPCO failed to include in its estimate the cost associated with the RT (finding 37), because it underestimated the time and effort required to properly weld the MFP P-1 piping butt joints to comply with the acceptance criteria of MIL-STD-2035A(SH) in tight quarters ascertainable during ship check (finding 87), and because Potter further slashed AEPCO's MFP MHs estimate by 12.5% (finding 29), we find that AEPCO underestimated the MHs required to complete the job order.

299. The evidence shows that after 26 March 2000, AEPCO was working on four other Navy job orders[28] (R4, tab 166, ex. F, Fig. F.8-1 at F-33; tr. 1575-76). There is no evidence that AEPCO could not take on more work after the original CCD (26 March 2000) because it was limited by its bonding capacity.

The Navy's Impact Analysis

300. In analyzing AEPCO's claim, Cummings constructed a CPM network he viewed as required by Standard Item No. 009-60. He did so by assigning "what appeared to be the intended logic behind AEPCO's schedule" and correcting "some of the activity sequences." (Ex. 2002 at 11, A72).

301. To evaluate the impact of the PCD, Cummings tied those specification items that related to dock-trial type testing (predecessor activities to sea trials) to 13 March 2000, a milestone representing the imposed PCD. Running his Primavera CPM program, Cummings found imposition of the PCD would have caused a ten-workday acceleration. His analysis concluded:

> On the assumption that a time extension would not be granted, acceleration would be the only way to account for these 10 days. The acceleration or "buying back time" would take the form of overtime, shift work, increased manning levels.

(Ex. 2002 at 11, A75) At the hearing, Cummings modified his conclusion slightly and found that the "imposition of the PCD date, in our analysis, would have caused 11 days negative in order to try to meet that with the existing schedule," or "there should have

[28] USS TRENTON (Job Order No. 0083), 2 February to 16 June 2000; USS SHREVEPORT (Job Order No. 0119), 18 April to 4 May 2000; USS CARON (Job Order No. 0122), 26 April to 4 May 2000; and USS ROSS (Job Order No. 0121), 28 April to 10 May 2000 (R4, tab 166, ex. F, Fig. F.8-1 at F-33; tr. 1575-76).

been a time extension granted for 11 days or acceleration to recoup the 11 days" (tr. 2931).

302. As his next step, Cummings inserted into his CPM schedule all of the specification work items and all of the sequences issued. He found, in most instances, AEPCO did not start work on time or as planned. In other instances, he found AEPCO started work on time but did not proceed in a linear fashion. According to Cummings, by deferring work to a later period, AEPCO created a situation where it was forced to stack trades, thus causing delays, interferences and inefficiencies. (Ex. 2002 at 17-38)

303. Cummings' analysis shows that, but for AEPCO's acceleration, Sequence No. 23G-related work would have delayed the project 17 workdays (ex. 2002 at 21, A125).

304. Incorporating all of the work items and the sequences, one at a time, into his CPM schedule, Cummings' analysis found the worst case came from Sequence No. 56G and shows—23 days float. He concluded:

> On the assumption that the March 13, 2000, PCD date was a contractual requirement . . . and that all other work had to be completed by March 26, 2000, AEPCO would have been working under a 23-Day maximum acceleration.

(Ex. 2002 at 13, A90)

305. Cummings did not perform a schedule analysis of the constructive changes AEPCO alleged to have occurred because "[t]here was no data provided to support the time impact from any of these issues" (ex. 2002 at 39, A235). Having reviewed all of the constructive changes claimed, we find nearly all of the changes alleged, with the exception of those related to Sequence No. 23G, to be what Willis would characterize as "normal, everyday circumstances of performing ship repair work"[29] (tr. 2834). We find their impact on the project, either individually or cumulatively, would have been minimal. Based on Cummings' CPM analysis, we find that AEPCO is entitled to a 23-day time extension based on Sequence No. 56G. Even though the delay that came about as a result of Sequence No. 56G turned out to be most critical, we find the impacts associated with RT of the butt welds and their rework, in terms of effort and costs, were far more significant.

[29] We borrowed the phrase from Willis, AEPCO's expert. AEPCO's ship superintendent's log on Job Order No. 0072 is replete with AEPCO's own tardiness and delay in performance (R4, tab 560; tr. 2834-57). When confronted by government counsel on this, Willis dismissed them as "normal, everyday circumstances of performing ship repair work" (tr. 2834).

306. After sea trials, MT. WHITNEY was made available to AEPCO for 29 days for it to correct deficient work: (1) 2 to 10 April 2000 (9 days); (2) 14 to 30 April 2000 (17 days); and (3) 4 to 6 May 2000 (3 days). During these periods, AEPCO was allowed to catch up on work items such as the large solid waste pulper that had been deferred so that resources could be diverted to work on the MFPs. The evidence shows that AEPCO worked weekends during the corrective availabilities. (Ex. 2024) Thus, to the extent that AEPCO is entitled to a 23-day time extension (due to Sequence No. 56G) based on Cummings' analysis, such time extension would run concurrently with the periods MT. WHITNEY was made available for AEPCO-responsible work. AEPCO has not challenged the CPM methodology Cummings employed; it has presented no CPM analysis of its own.

AEPCO's Disruption Claim

307. In Exhibit F of its claim, AEPCO sets out the causes and impacts of disruption brought about by the events alleged in the claim and the technique it used to estimate equitable adjustment (R4, tab 501-F). AEPCO's claim alleges that it experienced disruption due to (1) deficient job order specifications, (2) late or incomplete government-furnished information, (3) formal and constructive changes, (4) government-caused delay to work items and project completion, and (5) government-directed accelerations (R4, tab 501-F at GOV012503).

308. In connection with "Untimely and/or Incomplete Government-Furnished Information," the claim alleges generally that:

> . . . [C]ertain information was delivered by the Government in an untimely manner. . . . [T]he working drawings for the ShipAlts were not work-proven . . . . Many requests for clarification of drawing errors and omissions were submitted by AEPCO, and the Government was late in responding.

(R4, tab 501-F at GOV102504) AEPCO alleges that the government's failure to respond, or its failure to timely respond, had a great impact on AEPCO's ability to efficiently and timely man and progress the job, and diluted its supervision and management resources (R4, tab 501-F at GOV012504-06).

309. Willis was not able to be specific when asked how the LARs disrupted AEPCO's performance:

Q Did you tabulate any charges for these LARs that you're claiming were late as to how many days and how that impacted AEPCO?

A No, I did not.

(Tr. 4588)

310. AEPCO's claim alleges that the government's failure to timely respond with proper authorization to Condition Reports caused much of the original change orders to be performed late in the availability. In addition to formal change orders, AEPCO alleges that numerous constructive changes came about because of the government's actions or inactions. AEPCO alleges that the disruption due to both formal and constructive changes "extended to all work then underway as well as the work which was to be performed in the future as the result of each change." (R4, tab 501-F at GOV012506-07)

311. AEPCO's claim alleges that it bid the MT. WHITNEY job order to be performed without the use of overtime or additional shifts. It charges that it was required to accelerate its work due to numerous instances of added and changed work. AEPCO tells us that "a principal ingredient of MOUNT WHITNEY acceleration was overtime which requires premium payments, and additional shift work accompanied by additional shift differential costs." AEPCO alleges that "[w]hen these shift work and overtime expenditures were required, significant amounts of disruption occurred in the overall performance of AEPCO's contractual obligations." (R4, tab 501-F at GOV012509-10)

312. AEPCO's claim alleges that the original performance period established by the Navy should have permitted a work force composed of approximately "level loaded crafts" to perform the project with normal efficiency. AEPCO contends that the benefits of normal, well planned, performance techniques could not be realized due to "the large volume of changed and added work, in addition to untimely Government responses to condition reports and other AEPCO submissions." AEPCO says that the Navy should be responsible for introducing the resulting disruption and reduced productivity into AEPCO's operation. (R4, tab 501-F at GOV012511)

313. AEPCO's claim states that "[i]t is not extraordinarily difficult for a competent observer or analyst to discern disruption after it has taken place, but it is very difficult to quantify the productivity reductions and time and cost increases brought about by that disruption." According to AEPCO, "No universally accepted measuring system has been developed, nor do accounting systems exist, which will track the exact cost of disruption," and that "[t]hroughout the ship repair industry, the process used to quantify disruption is . . . 'engineering judgment.'" (R4, tab 501-F at GOV012515-16)

314. In quantifying disruption costs, AEPCO's expert consulted a NAVSEA document entitled "Guidelines on Factors Influencing Cost for Forward Pricing Change Order Disruption, Delay, Acceleration and Cumulative Effects" (NAVSEA Guidelines) (R4, tab 501-F at GOV012517). AEPCO's claim tells us that the genesis of the NAVSEA Guidelines was a system of disruption measurements called the "Range Method" which took into account a position paper published by NAVSEA's predecessor command, the Bureau of Ships (*id.* at GOV012518). The claim tells us that AEPCO quantified its disruption costs in this case "based on an adaptation of the original Range Method techniques with due consideration for the NAVSEA methodology:"

> In estimating its disruption losses, AEPCO utilized the accepted Range Method of calculation and estimation. Disruption was assigned based on a minute-per-hour rate over the applicable periods of Job Order performance using actual recorded manhours exposed to the effects of disruption.

(*Id*. at GOV012518-19)

315. The factors and ranges AEPCO used for estimating disruption in its claim were:

FACTORS	RANGES (mins/mh)
Location, Access, Weather and Routing (LAWR)	0 - 3
Manning, Levels and Type (MLT)	0 - 6
Frequency of Change/Interruption (FC/I)	0 - 5
Overtime/Multiple Shifts (O/MS)	0 - 2
Systems/Spaces Affected (S/SA)	0 - 4
Start/Stop/Delay (S/S/D)	0 - 6
Maximum AEPCO ("Range Method") Disruption	26

(R4, tab 501-F at GOV012521)

316. According to Willis, based on the project history, he assigned a numerical disruption rate for each factor based on his assessment of whether the disruption level was slight, moderate, or severe over 7 discrete periods of two weeks each. According to the claim, "Evaluation of disruption for each of these periods of Job Order performance recognizes the disruption impact is primarily a result of the Government's delays and changes." (R4, tab 501-F at GOV012522-23)

317. Based on the Range Method, Willis found a composite disruption rate of 6.5 minutes (or 10.83%) per hour:

DISRUPTION FACTOR	RANGE	ASSIGNED RATE
LAWR	0-3	0.75
MLT	0-6	1.75
FC/I	0-5	1.00
O/MS	0-2	1.25
S/SA	0-4	0.75
S/S/D	0-6	1.00
	TOTAL	6.5/10.83%

Based on its conclusion that a total of 39,567 MHs were exposed to disruption, and providing a credit of 1,016 MHs,[30] AEPCO's claim seeks 3,269 MHs for disruption. (R4, tab 501-F at GOV012530) Applying the same formula Willis used to estimate the costs of constructive changes, AEPCO claims $163,041 as an equitable adjustment for disruption (*id.* at GOV012531). In its post-hearing quantum brief, AEPCO modified the claimed amount to $134,307 (tr. 4557-60, 4565-66; app. quantum br., appendix A at 59 of 60).

318. The second part of AEPCO's disruption claim pertains to what it refers to as "Cross Contract Impact" (R4, tab 501-F at GOV012534). AEPCO asserts that it was "a well equipped and staffed ship repair company, at which there may be as many [as] two to four production contracts underway at any given time" (*id*. at GOV012532). It alleges the Navy pressured it into performing work on the MT. WHITNEY on a priority basis, thus impacting other ongoing work, and preventing it from shifting resources to other projects after 26 March 2000 (*id*. at GOV012538-39).

319. According to AEPCO's claim, for the period 12 January through 15 June 2000, 8,339 MHs worth of effort were spent on contracts being performed concurrently, and these contracts were performed at 80% efficiency as a result of the requirements the Navy imposed upon AEPCO on the MT. WHITNEY contract. AEPCO contends that the Navy was therefore responsible for 1,691 MHs, or 20% of the 8,339 MHs, in efficiency loss on its concurrent contracts. Applying the same formula Willis used in estimating its constructive changes claim, AEPCO seeks $85,902 as "Cross Contract Impact." (R4, tab 501-F at GOV012540-41; tr. 4578) In its post-hearing brief, AEPCO modified the claimed amount to $75,843 (tr. 4567; app. quantum br., appendix A at 60 of 60).

320. AEPCO has no solid evidence supportive of this claim. It does not know and has no record of who was pulled off other ongoing projects to work on MT. WHITNEY

[30] To eliminate any duplication, AEPCO's claim credited the Navy 1,016 MHs consisting of: (1) 104 MHs of local disruption claimed as a part of the 44 sequences settled by bilateral Modification Nos. 1B through 1K; and (2) 912 local disruption MHs claimed as a part of the remaining 29 unsettled sequences (R4, tab 501-F at GOV012519).

(tr. 4570). Willis maintained at the hearing "It's possible to trace that type of movement, but it is an extremely laborious task and I did not do it" (tr. 4579).

321. Cummings testified that the Range Method AEPCO used "is an estimating technique that assumes causation," was "intended to be a way of expediting the settlement process," and was "intended for forward-pricing only" (tr. 3877-78).

322. In the following exchange between appellant's counsel and Cummings, Cummings summarized his problem with AEPCO's methodology for computing disruption claim:

> Q And the disruption percentage that Mr. Willis computed is really quite modest, isn't it, 10 percent, 10.8 percent?
>
> A I guess that depends on how you measure modest. If you measure modest with dollar signs in front of it, I would say no. On the other hand, the real problem with the factor and coming up to the 10 percent is that he was comparing it against the percentages that were being used as estimating techniques by both parties during negotiations for sequences and applying it to the entire manpower pool as if everything in the contract is now a big sequence. That's what I disagreed with. The application of the factor across the board. It assumes causation across the board for everything and pretends the contractor didn't screw up at all, which is not sensible.

(Tr. 4594-95)

323. AEPCO's expert acknowledged that to determine the impact of those changes for which the Board finds entitlement, it is necessary to determine which changes "controlled the completion of the . . . job order," and to apportion what are determined to be the contractor's responsibility versus what are determined to be the government's responsibility (tr. 3846-47). Moreover, other than the allegations in its claim, AEPCO provided virtually no testimonial or documentary evidence establishing a casual connection between the disruption factors or variables used in its (Range) methodology and the disruptive events alleged to have occurred. Nor has AEPCO separated out, or provided a method for separating out, any disruption costs that it caused from those the Navy caused.

PART IV.

DECISION ON ENTITLEMENT

We address first several issues AEPCO raised in connection with Constructive Change C.9, which we deferred, namely, whether P-1 piping was required, whether RT of P-1 piping butt welds was required, whether SUPSHIP Portsmouth properly interpreted the RT films and required AEPCO to rework rejected joints.

Whether P-1 Piping Was Required

In its claim, AEPCO alleges:

> In addition, MOUNT WHITNEY Job Order solicitation Bid Specification Amendment #1 dated December 22, 1999 did not highlight the fact that P-1 Piping was involved in the Main Feed Pump ShipAlt (Item 255-90-002), and consequently *AEPCO did not price the resulting added labor or material in its bid.*

(Emphasis added) (R4, tab 501-C at GOV012383)

Although the MFP shipalt specification issued did not highlight the fact that P-1 piping was required, the requirement was evident from the drawing "LIST OF MATERIAL" (finding 34), as well as the General Notes (Nos. 9 and 12) on drawings 306 and 307 respectively (finding 33). AEPCO's bid was initially put together by two estimators and its purchasing manager. AEPCO's estimator knew P-1 piping was required (finding 37). Withers, AEPCO's purchasing manager, was also aware of the P-1 piping requirement. In doing material take-offs for Job Order No. 0072, she ordered material test reports which would only have been required for P-1 class piping (finding 35).

AEPCO asserts that "SUPSHIPs' established custom and trade usage was to conspicuously stamp specification [sic] with a red legend 'P-1 Piping' when RT inspections was required to be performed on P-1 piping." It argues that this "trade use and custom may be employed to aid in the interpretation of the contract." (App. entitlement br. at 66)

During the hearing, we admitted into evidence documents showing that on two occasions in 1998 when AEPCO performed TAV work, the index to the specifications and the specifications themselves referenced P-1 piping, and called out the specific NDT set out in Standard Item No. 009-12 (finding 36). This was not done in the case of MT. WHITNEY. On the MT. WHITNEY job order, the MFP shipalt drawings refer to P-1 piping.

In *Metric Constructors, Inc. v. NASA*, 169 F.3d 747 (Fed. Cir. 1999), the Federal Circuit explained that evidence of trade practice and custom is part of the initial assessment of contract meaning, and that such evidence should be accepted "only where a party makes a showing that it relied reasonably on a competing interpretation of the words when it entered into the contract." The Court also said that a contracting party cannot invoke trade practice and custom to create an ambiguity where there was none, and that even when accepted, "evidence of trade practice and custom does not trump other canons of contract interpretation," such as "an interpretation of a contract that gives effect to all its terms and leaves no provision meaningless." (*Id.* at 752-53)

Withers, AEPCO's purchasing manager and a member of the bidding team determined from the MFP shipalt drawings that P-1 piping was required. Thus, even assuming there was a trade practice or custom of highlighting P-1 piping requirements in specifications themselves, AEPCO has failed to prove, under *Metric Constructors*, that it relied on such trade practice or custom in reaching the interpretation it now advances.

Because the MFP shipalt drawings list P-1 piping in their list of material, and refer to P-1 piping in the drawing general notes, and because AEPCO has failed to show that it relied on any trade practice of highlighting P-1 piping requirements within the specification itself, we hold that Job Order No. 0072 required the installation of P-1 piping as part of the MFP replacement.

Whether RT of P-1 Piping Was Required

In its claim, AEPCO alleges:

> The P-1 requirements levied on AEPCO after Job Order award by the Supervisor required the use of procedures which require Radiographic Testing (RT), which in turn requires visual interpretation of X-Ray images of welded joints. RT results are necessarily subjective in that minor imperfections, such as certain inclusions or non-significant porosities may be adjudged acceptable by one qualified RT examiner while the same indications on the same film might be considered rejectable by another qualified examiner. . . . These factors can occasionally lead to disagreements between equally qualified RT experts and inspectors, and the potential for increased costs always increases when RT acceptance standards are applied to welding processes.

(R4, tab 501-C at GOV012400)

On the issue of whether RT of P-1 piping was required, AEPCO contends that the Navy's MFP shipalt contained a specific statement that quality assurance would be performed to the requirements of Standard Item No. 009-12, Table 1, Lines 1 through 10 (*see* finding 41). It contends that this statement confined NDT for the MFP to visual inspection, and the Navy's interpretation that RT was also required, "renders this specific provision useless and meaningless because RT inspection is specifically referenced elsewhere in SI 009-12." (App. entitlement br. at 66)

We cannot accept this argument because it fails to consider all of the pertinent documents of the MT. WHITNEY bid package. We have found that the MFP shipalt specification referred to, and bid package included, a number of drawings, among them, drawings 306 and 307. General Note No. 9 of drawing 306 provides that all fabrication and inspection for Class P-1 piping shall be in accordance with Tech. Pub. 278. Moreover, General Note No. 12 of drawing 307 provides that fabrication, welding and inspection of P-1 piping shall be in accordance with Tech. Pub. 278. (Finding 33) TABLE IX of Tech. Pub. 278, relating to "Class P piping inspection requirements," requires all final butt welds of P-1 piping exceeding 3 ½ inches to undergo 360° RT, and all final butt welds of P-1 piping up to 3 ½ inches to undergo a minimum of 60° RT. (Findings 45, 46)

Here, we apply the basic contract interpretation principle that "an interpretation that gives a reasonable meaning to all parts of the contract will be preferred to one that leaves portions of the contract meaningless." *Fortec Constructors v. United States*, 760 F.2d 1288, 1292 (Fed. Cir. 1985); *United States v. Johnson Controls, Inc.*, 713 F.2d 1541, 1555 (Fed. Cir. 1983); *Hol-Gar Manufacturing Corp. v. United States,* 351 F.2d 972, 979 (Ct. Cl. 1965). AEPCO's interpretation that only visual inspection of welded P-1 piping was required relied exclusively on ¶ 3.2 of the MFP shipalt specification (finding 41), and Table 1 of Standard Item No. 009-12 (findings 42, 43). That interpretation fails to consider Note 9 of drawing 306 and Note 12 of drawing 307 both of which refer to Tech. Pub. 278 where the disputed RT requirements are set forth in TABLE IX (findings 45, 46).

AEPCO argues next that since there is a conflict between Standard Item No. 009-12, Table 1 and TABLE IX of Tech. Pub. 278, paragraph 1.7 of Tech. Pub. 278 (finding 47) requires the conflict be resolved by giving precedence to the specification over "[t]his document," *i.e.*, Tech. Pub. 278. We do not agree with the premise that ¶ 3.2 of the MFP shipalt specification requiring accomplishment of Standard Item No. 009-12, Table 1, Column A, Lines 1 through 10 is in conflict with TABLE IX of Tech. Pub. 278. Paragraph 1.7, Tech. Pub. 278, defines the "Ship specifications" to include both "*plans and drawings*" (emphasis added). Thus, when the plans and drawings (which referred to Tech. Pub. 278) were read together, RT would have been a part of the "Ship specifications for a particular ship or class" and no conflict with Tech. Pub. 278 would have existed. (*See* findings 47, 48) *Hol-Gar, supra*, 351 F.2d at 979 ("nor should any

provision be construed as being in conflict with another unless no other reasonable interpretation is possible.")

Finally, AEPCO contends that *Southwest Marine, Inc.,* ASBCA No. 34799, 90-2 BCA ¶ 22,658, *recons. denied,* 90-2 BCA ¶ 22,820, is directly on point and must control the outcome of the RT entitlement issue here (app. entitlement br. at 67). *Southwest Marine* involved a situation where the contractor was required to remove the old expansion joints in the bleed air system of a destroyer and to replace them with new ones. The dispute in that appeal was whether the contractor was required to perform radiographic inspection of new welds. SUPSHIP San Diego contended that Table VIII of Mil. Std. 278 was applicable. The contractor contended that Table VIII was inapplicable pursuant to footnote 1 of Table VIII, Mil. Std. 278, and that Table XX of Appendix A was applicable.

The Board found to get to Table VIII of Mil. Std. 278, a bidder was required to read Note 24 of Drawing 204-6117327 which stated that "'fabrication and inspection of welded piping shall be [in accordance with] Mil-Std 278, P-1 piping.'" Paragraph 10 of Mil. Std. 278 in turn provided at ¶ 10.3.2 that Classes P-1, P-2 and P-LT piping "'shall be inspected in accordance with the requirements specified in Table VIII.'" On Table VIII, an "X" mark was placed at the line "P-1, butt welds, 4 inches and larger." (*Southwest Marine*, *supra,* 90-1 BCA at 113,840) The contractor contended that footnote 1 to Table VIII makes the table inapplicable. Footnote 1 stated:

> This table does not apply to piping used in components or accessories covered by Appendices A, B, and C which specifically list inspection requirements.

(*Id*.) In concluding that the ship's gas turbine was governed by Appendix A, Mil. Std. 278, and that Table XX of Appendix A required only magnetic particle (MT) and dye penetrant (PT), the Board held that the government changed the contract by insisting on RT of expansion joints.

Unlike *Southwest Marine,* we have found neither Note 1 nor Note 2 of TABLE IX, Tech. Pub. 278, exempt or render inapplicable P-1 piping butt welds from the NDT requirements, *i.e.,* RT of TABLE IX (finding 45). We conclude, therefore, *Southwest Marine* is distinguishable and does not control the outcome of the RT issue before us.

Because the drawings refer to Tech. Pub. 278 where the RT requirements are set forth in TABLE IX, and because AEPCO's interpretation ignores the drawing requirements, we hold that the contract required RT of the MFP P-1 piping.

Whether the Navy Could Rescind Sequence No. 23G

AEPCO contends that the Navy cannot rescind Sequence No. 23G. Relying on *USA Petroleum Corp. v. United States*, 821 F.2d 622 (Fed. Cir. 1987), AEPCO contends that SUPSHIP Portsmouth should be "estopped from disclaiming the actions of its agents where the agent was acting within his or her authority but made an error in the performance of that authority." (App. entitlement br. at 67-68)

In *USA Petroleum*, the government entered into a contract for the contractor to supply crude oil. Payment for the oil delivered was measured by government-furnished, controlled, and designed "strapping tables" that converted tank gauge reading to barrel quantities. The strapping tables turned out to be inaccurate and erroneously reported more oil was delivered than deposited. Almost a year after the government first became aware its strapping table had a problem, its CO issued a final decision seeking a refund. In the interim, the contractor had unknowingly made corresponding overpayments to its suppliers, and the overpayments could not be recaptured. Applying the well-settled principle of estoppel, the Federal Circuit held that the government was equitably estopped from claiming the overpayment because "the government was aware of a problem with the measurement of oil delivered . . . over a period of many months and many deliveries. . . . [A]nd word did not reach the contractor until six months after the government conclusively established that a portion of the measuring system was problematic." *USA Petroleum, supra*, 821 F.2d at 625. The result reached in *USA Petroleum* did not turn on the fact the government made a mistake but on the fact that it failed to timely notify the contractor until it was too late for it to prevent its overpayments to its suppliers.

In the case before us, AEPCO discovered the RT problem itself. SUPSHIP Portsmouth issued Sequence No. 23G promptly, albeit in hindsight erroneously. Moreover, AEPCO has no basis for arguing that it relied on the Navy's action to its detriment because the contract, as we have found, required AEPCO to perform RT in the first place.

Because SUPSHIP Portsmouth did not by its action lead AEPCO into performing RT to its injury since the work was called for by the contract, we hold that the Navy is not estopped from rescinding Sequence No. 23G.[31]

[31] We note that the parties had negotiated a settlement of Sequence No. 23G, which, if finalized, would have been enforceable. Ironically, AEPCO was the one that changed the terms of the settlement and prevented its finalization by way of a modification.

Whether SUPSHIP Portsmouth Improperly Read the RT Films and Required AEPCO to Rework Rejected Welds

In connection with inspecting and rejecting weld joints, AEPCO contends that SUPSHIP Portsmouth applied unreasonably high standards. AEPCO attributed the higher than normal rejection rate to the inexperience of Villorente, SUPSHIP Portsmouth's RT inspector, and to the crowded working conditions and long work shifts to which its welders, pipe fitters, QA personnel and supervisors were subjected. AEPCO contends that the high rejection rate in turn caused the captain of the vessel and SUPSHIP Portsmouth to lose confidence in its ability to rework the joints in a timely manner and caused them to direct it to subcontract rework of the rejected joints to NORSHIPCO. (App. entitlement br. at 16-18)

Contrary to AEPCO's assertion at the hearing that reading RT films was totally subjective, we have found that the acceptance criteria set forth in MIL-STD-2035A(SH) are "quantifiable" and "measurable," and even though some subjectivity cannot be totally eliminated, interpreting RT films involves more science than art (findings 73, 92).

As far as Villorente is concerned, he was certified as a Level II inspector pursuant to NAVSEA Tech. Pub. 271. Such certification shows *prima facie* that he was qualified to interpret RT films. (Findings 70, 71) Based on testimony, we have found that in reviewing RT films, both Villorente and Lovingood, a Level III RT examiner SUPSHIP Portsmouth brought in from SUPSHIP Newport News, followed the acceptance criteria set out in MIL-STD-2035A(SH). On the other hand, Harrington, Si-Tech's Level II inspector assigned to MT. WHITNEY, did not testify, and we are uncertain what acceptance criteria he followed in accepting the welds SUPSHIP Portsmouth later rejected (finding 76). When Dennis, a Level III examiner, and Si-Tech's president, met with Villorente and Lovingood on 20 March 2000 to review the welds Harrington accepted, he agreed with most, if not all, of Villorente and Lovingood's interpretations, and admitted that Harrington was "under a lot of pressure from the contractor due to the short time frame" (finding 78). Based on the evidence in the record, we have found SUPSHIP Portsmouth's interpretation of Si-Tech's RT films to be fair and in accordance with the contract acceptance criteria (finding 92).

Because the evidence indicates that SUPSHIP Portsmouth rejected welds based on criteria set forth in the contract, we hold that SUPSHIP Portsmouth did not constructively change the contract by directing rework of the rejected welds.

Whether AEPCO's Directed Subcontract with NORSHIPCO Constituted A Compensable Change

By letter dated 21 March 2000, a SUPSHIP Portsmouth Deputy CO directed AEPCO "to pursue correction of rejected joints through either Earl Industries or Norfolk

Shipbuilding and Drydock Corporation" (finding 81). AEPCO complied with this direction (finding 84). Ostensibly, this direction was given because SUPSHIP Portsmouth had lost confidence in AEPCO's ability to rework the rejected joints in a timely fashion as a result of the high rejection rate experienced (finding 81). In directing replacement of AEPCO's work force to correct rejected joints, SUPSHIP Portsmouth did not invoke the contract termination clauses[32]; nor did it based its direction on any specific contract right (finding 80).

Despite the captain's assessment to the contrary, we are not persuaded that SUPSHIP Portsmouth's lack of confidence was justified. The evidence shows that notwithstanding the welders NORSHIPCO sent to MT. WHITNEY were "the cream of the crop," joints welded by them actually had a higher rejection rate (finding 86). Based on the testimony of NORSHIPCO's production manager, we have found the higher than normal rejection rate was attributable to the inherent difficulty in welding around the tight spaces in the MFP area, and not to any perceived AEPCO inability to rework or correct the rejected welds (finding 87). We have found given the same set of circumstances and opportunity, AEPCO could have reworked and corrected the defective welds found in time for sea trials.

In *Liles Construction Co. v. United States*, 455 F.2d 527 (Ct. Cl. 1972), the CO ordered the contractor to remove its painting subcontractor for allegedly deliberately deviating from the specification. The CO did not invoke the Default or any other clause of the contract. The contractor complied and sought an equitable adjustment as an express change. The Court observed that while the CO had the power to order the removal of the subcontractor, the issue was "whether he had the contractual *right* to do it without obligating the Government to compensate the contractor for any additional costs incurred." 455 F.2d at 531. The Court found that ordering removal of the subcontractor was a change in the method and manner of performance:

> . . . There is no greater interference with the manner and method of performance, short of termination of the work itself, than the ordered replacement of the craftsmen originally chosen to do the work.

Id. at 532. It held that such a change in the method or manner of performance constituted a compensable change "when it has failed to expressly reserve such a right in the contract," and the contractor was entitled to recover, in a quantum proceeding, "excess costs proximately resulting to it from the Government's express direction to remove the

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[32] Job Order No. 0072 incorporated by reference as I-1-105, FAR 52.249-2, TERMINATION FOR CONVENIENCE OF THE GOVERNMENT (FIXED-PRICE) (SEP 1996) and as I-1-132, DFARS 252.217-7009, DEFAULT (DEC 1991) (R4, tab 1, solicitation at 32-33 of 66).

subcontractor from the project." *Id.* at 533. *See also Richerson Construction, Inc. v. General Services Administration*, GSBCA Nos. 11161 *et al.,* 93-1 BCA ¶ 25,239 at 125,705-06 (a direct order was found when CO ordered contractor to obtain a different subcontractor), *modified on other grounds*, 93-3 BCA ¶ 26,206; *J. Lawson Jones Construction Co.,* ENG BCA No. 4363, 86-1 BCA ¶ 18,719; *Wolfe Construction Co.,* ENG BCA Nos. 3610 *et al.,* 84-3 BCA ¶ 17,701; *General Dynamics Corp.,* ASBCA No. 11928, 70-2 BCA ¶ 8401.

Because SUPSHIP Portsmouth failed to show it had a contract right to direct AEPCO to replace its work force with a subcontractor in reworking and correcting rejected welds, and because such a direction changed the method and manner of performance of the contract, we hold that AEPCO is entitled to a compensable change.

Constructive Acceleration

AEPCO contends that SUPSHIP Portsmouth constructively accelerated the contract work in two ways: first, it was pressured into meeting the non-contractual PCD, and second, it was "required to halt performance on some tasks, such as the shredder/pulper SHIPALTs and transfer personnel from those halted and delayed jobs to the effort related to the main feed pump" (app. entitlement br. at 119). The Navy counters that AEPCO failed to meet its burden of proof because it failed to provide a CPM schedule as required by Standard Item No. 009-60, and it could meet this burden "only through doing this" (gov't entitlement br. at 215).

To recover for increased costs of acceleration under the Changes clause, a contractor must establish that: (1) any delays giving rise to the order were excusable; (2) the contractor was ordered to accelerate; and, (3) the contractor in fact accelerated performance and incurred extra costs. *Norair Engineering Corp. v. United States*, 666 F.2d 546, 548 (Ct. Cl. 1981).[33] A constructive order to accelerate differs from a direct order to accelerate in that a constructive order to accelerate "need not be couched in terms of a specific command. A *request* to accelerate, or even an expression of concern about lagging progress, may have the same effect as an order." *Id.* at 549.

[33] As indicated in footnote 5 of the *Norair* opinion, the court considered two more elements – that the contractor specifically request an excused delay and that the request be denied – to have been "in effect equivalent" to the second element. 666 F.2d at 548. *See also Fraser Construction Co. v. United States*, 384 F.3d 1354 (Fed. Cir. 2004) (five element test). The ASBCA has set out a similar five-element test for constructive acceleration. *Fermont Division, Dynamics Corporation of America*, ASBCA No. 15806, 75-1 BCA ¶ 11,139 at 52,999-53,000, *aff'd,* 216 Ct. Cl. 448 (1978); *Commercial Contractors Equipment, Inc.,* ASBCA Nos. 52930 *et al.,* 03-2 BCA ¶ 32,381 at 160,261.

(a) Acceleration Due to Imposition of the PCD

The PCD relates to the machinery space of the vessel. That space must be completed before the vessel can go to sea trials. The PCD was not a milestone within the contract (finding 19). Hence, under its contract, AEPCO had until 26 March 2000, the CCD, to complete the machinery space. Unbeknownst to the PCO and to AEPCO, the Chief Engineer of the vessel advised ship surveyor Hunt on 7 January 2000, several days prior to award of Job Order No. 0072, that all work in the machinery space must be completed by 13 March 2000 so that the space could be in the hands of the ship's force in preparation for sea trials to be conducted between 27-30 March 2000 (findings 18, 20).

With respect to requiring AEPCO to meet the PCD (13 March 2000), 13 days earlier than the CCD (26 March 2000), government contracting officials, including ACO Stroud, acknowledged that AEPCO was ordered to accelerate (finding 20). The evidence shows that as a result of the government's direction, AEPCO accelerated immediately on 13 January 2000 to try to meet the PCD; it "[w]orked the first weekend" even though working weekends was not a part of its original plan (findings 30-31).

We need not, however, resort to the theory of constructive acceleration. Because the Changes clause of the contract, DFARS 252.217-7003, authorized certain specified changes, including "(4) Time of commencement or completion of the work," and because the imposition of the PCD occurred at the very beginning of the availability, prior to the occurrence of any delay caused by AEPCO, we hold that AEPCO is entitled to an equitable adjustment for acceleration as a directed change under the Changes clause.

(b) Acceleration Due to Welding, Radiographic Inspections and Rework of MFP P-1 Piping Joints

As of the CCD, the large solid waste pulper and the metal/glass shredder shipalts were both incomplete. During the course of the original availability, AEPCO diverted resources from, or "starved," these shipalts to work on the MFPs because the vessel could not leave port for sea trials without completing them. (Findings 289, 290, 293) In contending that it was required to "halt performance" on the large solid waste pulper and the metal/glass shredder, AEPCO is actually contending that it was constructively required to accelerate performance on the MFPs.

There is no question that AEPCO accelerated its performance with respect to the installation of the MFPs. On 12 February 2000, after being told that RT would be required, AEPCO increased its manning from working 10 hours a day, 7 days a week, to

working 12 hours a day, 7 days a week[34] (finding 57). As a result of a meeting between SUPSHIP Portsmouth representatives and AEPCO's general manager on 28 February 2000, AEPCO immediately went to two 12-hour shifts, working around the clock (finding 64).

During installation of the MFPs, a large number of P-1 piping weld joints were rejected by SUPSHIP Portsmouth. This caused rework and re-inspection. AEPCO blamed over-inspection on the part of SUPSHIP Portsmouth inspectors. We have found that RT was a part of the contract requirements. We have found that interpreting RT films is more science than art, and even though subjectivity cannot be totally eliminated, most defects are quantifiable, measurable and repeatable, and SUPSHIP Portsmouth's interpretation of Sci-Tech's RT results to have been fair and in accordance with the contract acceptance criteria (finding 92). Inasmuch as proper welding and RT of P-1 piping joints were a part of its original contract work, we conclude that AEPCO is not entitled to recover its acceleration costs to complete the contract on time.

Because the contract required AEPCO to properly weld, RT, and rework defective MFP P-1 piping butt joints, and because SUPSHIP Portsmouth properly inspected and rejected the defective welds, we hold that AEPCO is not entitled to recover the cost of acceleration to comply with the foregoing requirements.

Entitlement to Delay and Eichleay Damages

AEPCO tells us that the issuance of Sequence No. 23G and the attendant imposition of "defective and extraordinary inspections" of the MFP P-1 piping welding extended the contract performance period "well beyond the original completion date of March 26, 2000." AEPCO says that it continued to perform work on MT. WHITNEY as late as 15 June 2000, and was still on standby until 22 June 2000. AEPCO contends "the period from March 26, 2000 to June 22, 2000 represents a period of performance delay attributable to the Government and only the Government." (App. entitlement br. at 120-21) At the hearing, AEPCO changed the delay period of 80 days (from 27 March to 15 June 2000) to 91 days (from 27 March to 26 June 2000). According to Willis, although 15 June 2000 was the last day on which there was an AEPCO charge against Job Order No. 0072 (tr. 4432), the contract period should be extended another 11 days to 26 June 2000 because "that's the last date when the Navy finally took out the installation requirement for the firemain valves; and that's the date that AEPCO knew it could terminate that project except for possible warranty work" (tr. 2645-46).

The Navy argues that to recover delay costs, AEPCO must prove that the Navy was the sole cause of the delays. It argues "AEPCO by failing to do an impact analysis

[34] This was a 2-hour per day increase since AEPCO was already working 10 hours a day, 7 days a week, to meet the PCD.

has failed to show a causal nexus between the alleged Government-caused delay and any delay in contract performance it encountered" (gov't entitlement br. at 223). For the work performed in May 2000, the Navy contends "this was a direct result of AEPCO failing to order Temperature Regulating valves in a timely matter" (*id.* at 224-25). As for standing by until 26 June 2000 when the Navy deleted installation of the 7 firemain valves, the Navy contends that AEPCO has failed to prove that it ever actually purchased the 7 deleted valves (*id.* at 225).

As for *Eichleay* damages, the Navy argues "AEPCO has not demonstrated why it was impracticable to take on other jobs, such as offering proof that it had reached bonding limit." The Navy points out "AEPCO contracted with SUPSHIP Portsmouth for four new jobs in the time period from March 22, 2000 through April 28, 2000, and therefore, did not seem to have a problem contracting for new work." (Gov't entitlement br. at 225)

A delay connotes a time period completion of a project must be extended to account for slowdown or unanticipated events. To recover delay damages, the contractor has the burden of demonstrating that the specific delays were due to government-responsible causes, that the overall completion was delayed as a result, and that any government-caused delays were not concurrent with delays within the contractor's control. *Jefferson Construction Co. v. United States,* 368 F.2d 247, 256 (Ct. Cl. 1966) (It is the contractor's burden to show "where the work was delayed because of the lack of approval"); *Woerner Engineering, Inc.,* ASBCA No. 52248, 03-1 BCA ¶ 32,196 at 159,143; *W.G. Yates & Sons Construction Company,* ASBCA Nos. 49398, 49399, 01-2 BCA ¶ 31,428 at 155,215.

According to AEPCO, the main event that prevented completion of the contract by the CCD was the requirement to conduct RT of the MFP P-1 piping butt welds, and the resultant requirement to correct defective welds. Potter verified that had he known that P-1 pipe joints would have to be subjected to RT, AEPCO's price on the MFP replacement shipalt "would have at least doubled" (finding 49). With the ability to work on weekends and overtime, neither imposition of the PCD nor the sequences issued under the contract would have extended the contract performance period. Potter testified that other than the work generated as a result of Sequence No. 23G, the contract changes had "minimal" effect on AEPCO's ability to meet the contract schedule but "the x-ray on the main feed pump" was "the killer" (finding 295).

Standard Item No. 009-60 required AEPCO to submit and update weekly a production schedule and network based on CPM (finding 275). It requires the critical path be based upon "time duration required for the activity, *space limitations, manpower available, and the interface between Work Item activities*" (finding 276). The CPM production schedule is required to be revised weekly to "include additions, deletions, modifications, progress, and completions" (finding 275). AEPCO and its subcontractors

were required to use the CPM production schedule "*as a means of planning, tracking, and coordinating the accomplishment of contract work*" (finding 276).

AEPCO did not submit a CPM-based production schedule or network. There is no documentary evidence that AEPCO updated the schedule it did submit (Finding 278). We have found that AEPCO's failure to comply with Standard Item No. 009-60 left it with an inability to demonstrate what impact occurred at the time the various Navy actions were alleged to have occurred (finding 281). Even though deciding not to comply with Standard Item No. 009-60 might have saved AEPCO money in the short run, it had the predictable effect of diminishing AEPCO's ability to prove its case when it encountered unanticipated events. Nor has AEPCO supported its claim with any as-built CPM analysis based on the documentary record (finding 306).

In support of its claim, AEPCO submitted instead a series of unrelated graphs based on IPARs of several controlling jobs (findings 287-92). We are doubtful whether the IPARs truly measured progress because they were not based on individual work items but based on a "milestone estimate technique" where "arbitrary percentages" were assigned for payment purposes (finding 287). We cannot therefore accept these graphs as credible evidence of what actually occurred in an as-built versus as-planned context. In short, we do not find AEPCO's analyses helpful because they did not tie the entire project together and eliminate those causes that are not recoverable (finding 294).

Courts and boards of contract appeals have acknowledged that CPM analysis is the preferred method for determining the causes of delay. *Haney v. United States*, 676 F.2d 584 (Ct. Cl. 1982); *G.M. Shupe, Inc. v. United States*, 5 Cl. Ct. 662 (1984); *Al Johnson Construction Co.*, ENG BCA Nos. 4078, 4818, 87-3 BCA ¶ 19,980 at 101,253 (claim for full delay rejected because contractor used bar chart schedule without a critical path and claim was based on conclusory testimony), *aff'd, Al Johnson Construction Co. v. United States*, 854 F.2d 467, 470 (Fed. Cir. 1988) ("'critical path,' a favorite device with present day fact finders in contract disputes"). The use of bar charts has been rejected because they do not reflect the causal connection between the alleged delaying events and the delays to the project. *H.W. Detwiler Co.*, ASBCA No. 35327, 89-2 BCA ¶ 21,612 (contractor failed to prove by critical path analysis or otherwise a cause-effect relationship between any matters related to the ECP and any item of work controlling the delivery of the boat). The court has rejected the "total time" approach of proving delay. *Law v. United States*, 195 Ct. Cl. 370, 384 (1971) ("the mere fact that defendant took four weeks, or four months, or even longer, is in itself meaningless. The length of time is meaningful only in relation to the effect it had on the project operations").

The Navy's CPM expert, Cummings, on the other hand, constructed a CPM he viewed as required by Standard Item No. 009-60. He inserted into the CPM schedule all of the specification work items and all of the sequences issued related to each work item, including Sequence No. 23G, one at a time. Based on this item by item, sequence by

sequence analyses, Cummings found that, but for AEPCO's acceleration, imposition of the PCD would have caused 11 workdays negative delay, and Sequence No. 23G would have delayed contract completion by 17 workdays (findings 301, 303)[35]. Cummings' CPM analyses also found, however, these two delaying events would have been included and therefore subsumed in a 23-workday delay to contract completion caused by Sequence No. 56G (finding 304).

AEPCO has not challenged the CPM methodology Cummings employed in analyzing the claim (finding 306). Its scheduling expert, Willis, acknowledged that a CPM analysis based on logic ties and inserting causes of delay is useful in projecting impact on contract completion date (finding 282). We conclude that Cummings' analysis is credible and supportable because (1) it is based on a CPM schedule contemplated by Standard Item No. 009-60; (2) it is based on revising the CPM schedule thus constructed by incorporating all changes (except constructive changes which we have found to be insignificant) and thus demonstrating the cause and effect of each incorporated change to the original scope of work; (3) it is based on documentary evidence in the record; and (4) it appears to have been based on an unbiased evaluation of an experienced CPM expert. *Fischbach & Moore International Corp.,* ASBCA No. 18146, 77-1 BCA ¶ 12,300 at 59,224 (CPM not required by contract; Board accepted unchallenged CPM analysis based on construction experience of expert).

Concurrent delays arise when two or more delaying events occur during the same period of time. Where responsibility for concurrent delays cannot be apportioned between the parties, neither the contractor nor the government can recover delay damages from each other. *Blinderman Construction Co. v. United States,* 695 F.2d 552 (Fed. Cir. 1982); *Commerce International Co. v. United States,* 338 F.2d 81, 90 (Ct. Cl. 1964).

Because MT. WHITNEY had sailing commitments, it was only available for work during specific availabilities. Work caused by Navy or AEPCO delays must therefore both be performed during limited post-contract availabilities. We look to what specific work AEPCO was performing during each post-contract availability to determine whether the work is compensable or whether compensation is precluded due to concurrent delays. Corrective work, for example, is generally not compensable because the contractor was supposed to have corrected its own deficient work within the availability established by the original contract.

After sea trials on 30 March 2000, MT. WHITNEY was made available to AEPCO from 2 to 10 April 2000 (9 days), 14 to 30 April 2000 (17 days) and 4-6 May 2000 (3 days) for 29 days. During these availabilities, AEPCO corrected deficient work

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[35] As a practical matter, except for work that AEPCO deferred in order to focus on Sequence No. 23G and attendant rework, the delays were actually minimized, if not totally avoided, because AEPCO accelerated.

and caught up on work items such as the large solid waste pulper that had been deferred during the original availability so that AEPCO could focus on completing the MFPs (finding 306). The delays associated with correcting deficiencies and deferred work cannot be attributed to the Navy. The evidence shows that SUPSHIP Portsmouth issued a Certificate of Completion and Acceptance of Work on 30 April 2000, and assessed no liquidated damages (findings 265, 274). We conclude that Job Order No. 0072 was excusably delayed until 30 April 2000, and the project was substantially complete on that date.

AEPCO also argues that its contract should be extended to 26 June 2000 because until the Navy deleted installation of the 7 firemains, AEPCO had to maintain a readiness to install them. AEPCO has not shown that it in fact ordered the firemains, and ordered them in a timely manner. Without such proof, we cannot attribute any delivery delays to the Navy. (Finding 272)

We have found that to the extent AEPCO is entitled to a 23-day time extension due to Sequence No. 56G, such time extension would run concurrently with the periods MT. WHITNEY was made available for AEPCO-responsible work (finding 306). AEPCO has not apportioned responsibility for concurrent delays for the period 27 March to 30 April 2000. The evidence show that as late as 4 to 6 May 2000, AEPCO was still finishing up with corrective work and installing the E-10 temperature regulating valve (findings 267, 269).

Because the 23-day time extension to which AEPCO is entitled due to Sequence No. 56G ran concurrently with the availabilities given to AEPCO for performance of corrective and incomplete work that were its responsibility, and because AEPCO has not otherwise established government-responsible delays, we hold AEPCO is not entitled to delay damages.

AEPCO also contends that it is entitled to *Eichleay* damages for the period 27 March to 26 June 2000. The *Eichleay* formula "is used to calculate the amount of unabsorbed home office overhead a contractor can recover when the government suspends or delays work on a contract for an indefinite period." *P.J. Dick, Inc. v. Principi*, 324 F.3d 1364, 1370 (Fed. Cir. 2003). Generally, unabsorbed home office overhead includes "time sensitive indirect costs incurred despite construction inactivity on a project," such as "accounting and payroll services, general insurance, salaries of upper-level management, heat, electricity, taxes, depreciation." *Interstate General Government Contractors, Inc. v. West,* 12 F.3d 1053, 1058 (Fed. Cir. 1993). To show entitlement to *Eichleay* damages, the contractor must make out a *prima facie* case that (1) there was a government-caused delay to contract performance that was not concurrent with a delay caused by the contractor, (2) that the original time for performance of the contract was extended, and (3) that it was required to remain on standby during the delay. Only after the contractor has proven these elements, does the burden of production shift

to the government to show that "it was not impractical for the contractor to take on replacement work and thereby mitigate its damages." *P.J. Dick,* 324 F.3d at 1370.

In this case, the original CCD was 26 March 2000. We have found through Cummings' CPM analysis that AEPCO is entitled to a 23-day time extension due to Sequence No. 56G. This time extension, if given, would have run concurrently with the corrective availabilities given to AEPCO during (1) 2-10 April 2000 (9 days), (2) 14-30 April 2000 (17 days), and (3) 4-6 May 2000 (3 days), during which AEPCO also performed incomplete work. Since Navy-caused delay ran concurrently with AEPCO-caused delays, we conclude that AEPCO has failed to make out a *prima facie* case for entitlement to *Eichleay* damages for the period 27 March to 6 May 2000. AEPCO claims it was required to remain on standby to install the firemain valves until the Navy deleted the requirement on 26 June 2000. AEPCO, however, has not shown that it ordered the fire main valves. Consequently, we are unable to attribute a delay to 26 June 2000 to the Navy. Here, AEPCO has failed to prove that it was required to remain on standby between 7 May and 26 June 2000.

Because AEPCO has failed to prove the elements required to make out a *prima facie* case, we hold that it is not entitled to *Eichleay* damages.

Entitlement To Disruption Costs

AEPCO seeks loss of productivity costs allegedly resulting from (1) disruption to the manner it planned to perform the contract, and (2) disruption to other contracts it was performing concurrently. As for disruption to the manner it planned to perform the contract, AEPCO alleges that the Navy did so by introducing Sequence No. 23G half way through the contract, by demanding AEPCO increase its manning level to work consecutive shifts and overtime in tight spaces, by introducing other contractors to work in the same area, and by requiring it to turn over its work to a subcontractor. (App. entitlement br. at 125-26)

Loss of productivity caused when a contractor is required by the government to alter its method of performance so as to proceed in a less productive manner is recoverable. *Luria Brothers & Company, Inc. v. United States*, 369 F.2d 701, 712 (Ct. Cl. 1966) As with any claim for increased cost, in order to recover lost productivity costs, a contractor must prove (1) liability, (2) causation and (3) damages. *Blinderman Constr. Co. v. United States*, 39 Fed. Cl. 529, 537 (1997), *aff'd, Blinderman Constr. Co. v. United States*, 178 F.3d 1307 (Fed. Cir. 1999) (table).

Loss of productivity is generally established by expert testimony. As stated by the Court of Claims, "It is a rare case where loss of productivity can be proven by books and records; almost always it has to be proven by the opinions of expert witnesses." *Luria Brothers,* 369 F.2d at 713. Various methods have been used to quantify loss of

productivity. The "measured mile" approach compares the productivity of an impacted period of the project with the productivity of an unimpacted period. *See, e.g., U. S. Industries, Inc. v. Blake Constr. Co.,* 671 F.2d 539, 547 (D.C. Cir. 1982) ("Such comparison of the cost of performing work in different periods is a well-established method of proving damages"); *DANAC, Inc.,* ASBCA No. 33394, 97-2 BCA ¶ 29,184, 145,152. Government guides or studies have been used, but absent proof of a causal connection between the factors used and impacted event, they have not been well received by the Board. *DANAC,* 97-2 BCA at 145,153 ("absent a greater evidentiary link between the described phenomenon and this project," the Board refused to accept the Corps of Engineers' Guide as sufficient proof, by itself, of crew overloading); *Triple "A" South,* ASBCA No. 46866, 94-3 BCA ¶ 27,194 at 135,537 (factor percentages of six impact variables rejected as essentially a variation of the "total cost" method and because they showed no causal relation to any particular changes and their actual impact on other overhaul work).

Coastal Dry Dock & Repair Corporation, ASBCA No. 36754, 91-1 BCA ¶ 23,324, involved a fixed-price contract for the regular overhaul of an ammunition ship. In a decision on entitlement, the Board found cleaning and painting athwartship trackways were not required by the contract and therefore constituted a compensable change. *See Coastal Dry Dock & Repair Corporation*, ASBCA No. 31894, 87-1 BCA ¶ 19,618. When the parties could not agree on quantum, they went back to the Board. Based on acknowledgment of the government's principal witness at the quantum hearing, the Board found that "the trackways cleaning and painting constructive change disrupted the basic specification and other change order work" (91-1 BCA at 116,994). Through the testimony of witnesses, the contractor identified each work item that was disrupted by the trackway work and explained how they were disrupted. In pricing local disruption, the Board adopted a methodology the parties themselves had used for many of the change orders issued on the vessel. The methodology, developed by government experts, was based on "seven identifiable value elements which essentially describe the nature of the disruptive change in terms of its disruptive effects": "(1) the number of trades or crafts involved, (2) the number of workers involved in the area where the change is being performed, (3) the complexity of the space involved in the order of the change, (4) the period of performance, (5) the scope of the work, (6) the growth in the total work to be done, and (7) the time to accomplish the change." *Coastal Dry Dock, supra,* 91-1 BCA at 116,997. The contractor in *Coastal Dry Dock* assigned a numerical value to each of the seven factors. The total value obtained was multiplied by the claimed hardcore manhours to derive total disruption hours, which, when multiplied by the applicable billing rate, produced the cost of local disruption.

The facts present in *Coastal Dry Dock* are not present in this appeal. First, in *Coastal Dry Dock*, entitlement to an equitable adjustment was established in an earlier entitlement decision. *See Coastal Dry Dock,* 87-1 BCA at 99,239. During the quantum phase of the hearing, the contractor's witnesses provided a detailed account of how the

change (cleaning and painting the athwartship trackways) disrupted ongoing work. Moreover, the government's principle witness admitted disruption occurred as a result of the change. Second, the Board "found sufficient facts describing the conditions of the performance of the trackways work to support the assignment of the numerical values [to the disruption variables] . . . to arrive at the amount of local disruption." *Coastal Dry Dock*, *supra,* 91-1 BCA at 117,003. Thus, the Board considered the contractor in *Coastal Dry Dock* to have established the necessary causal connection between the disruption variables and the actual disrupting events, and was satisfied that the assignment of numerical values was reasonable under the facts of the case. Third, the Board in *Coastal Dry Dock* adopted the disruption methodology used in that case because both parties had "relied upon the methodology to negotiate the pricing of local disruption costs for many of the change orders issued" (*id.*).

In the case before us, other than the allegations in its claim, AEPCO provided virtually no testimonial or documentary evidence establishing a causal connection between the disruption factors or variables used in the Range method with any specific instances of untimely or incomplete government-furnished information, or with any specific change orders, formal or constructive. Unlike the situation in *Coastal Dry Dock*, where entitlement was clearly established, we have found, in this case, that the contract documents, when read in their entirety, required AEPCO to perform RT, that SUPSHIP Portsmouth's interpretation of the RT results was fair and in accordance with the contract acceptance criteria, and that AEPCO was properly required to correct defective welds.

In light of evidence in the record that formal and constructive changes had minimal impact (finding 295), and that Sequence No. 23G and related work "changed the entire complexion of the project" (finding 58), we conclude that AEPCO, and not the Navy, was responsible for the bulk of the loss of productivity experienced during performance.

Even if the Navy was responsible for causing some disruption, it is AEPCO's burden to allocate damages relating to loss productivity, and its failure to do so would bar recovery entirely. *Net Construction, Inc. v. C & C Rehab and Construction, Inc.*, 256 F. Supp. 2d 350 (E.D. Pa. 2003) (claim for loss of productivity denied because subcontractor failed to establish a reasonable allocation of extra costs as a result of particular delays caused by the prime); *Lichter v. Mellon-Stuart Co.*, 305 F.2d 216, 219 (3d Cir. 1962) (affirmed lower court decision denying totally subcontractor's recovery for disruption due to failure to allocate damages between causes for which it was responsible and those it was not). In this connection, we have found, had it submitted and updated a "resource loaded" CPM as required by Standard Item No. 009-60, AEPCO could have tracked disruptive impact through the schedule (finding 281).

Because AEPCO has failed to establish a causal connection between the disruption factors or variables used in its methodology and the disruptive events that are the subject

of its claim, and because AEPCO has failed to allocate its claimed disruption costs between itself and the Navy, we hold that AEPCO is not entitled to recover any such costs.

PART V.

FINDINGS OF FACT ON QUANTUM

Equitable Adjustment Methodology for Pricing the Unresolved Formal Sequences

324. AEPCO uses a project costing accounting system. Each contract it receives is assigned a project number. (Tr. 3821) Charge No. 2419-003 was assigned to Job Order No. 0072 (tr. 3822). Direct costs, including labor, material and subcontract costs were charged to Charge No. 2419-003. Costs incurred were not accumulated or segregated by individual sequences. (Tr. 3484, 3821) AEPCO's accounting system had been subjected to routine audits for various purposes by the Defense Contract Audit Agency (DCAA) and had been found acceptable (tr. 3820).

325. AEPCO's company policy was to charge labor hours to the job account, *i.e.,* Charge No. 2419-003, not to the individual work items. During the project, Potter decided to keep track of the MHs worked on the pulper for future reference. He later abandoned the effort. For unexplained reasons, some AEPCO employees did charge MHs to individual work items. Not all of them did so however, others followed the company policy and charged only to the job. As a result, a large number of hours in the job account could not be assigned to specific work items. (Tr. 3162-66, 3181)

326. SUPSHIP Portsmouth did not choose to include in the MT. WHITNEY contract a clause substantially the same as FAR 52.243-6, CHANGE ORDER ACCOUNTING (APR 1984), as permitted by FAR 43.205(f). Such a clause could have required AEPCO to maintain for each change or series of related changes of an amount SUPSHIP Portsmouth deemed suitable separate accounts "of all incurred segregable, direct costs (less allocable credits) of work, both changed and not changed, allocable to the change"[36] (FAR 52.243-6). Thus, there was no contractual obligation on AEPCO's part to depart from its normal accounting procedure to collect and segregate costs relating to any formal sequences ordered or for constructive changes. We find the Navy could have, but did

[36] FAR 43.203(a) recognizes that "Contractors' accounting systems are seldom designed to segregate the costs of performing changed work." The Government's failure to prescribe a change order accounting clause may be used by the contractor to support a price adjustment in the absence of actual cost records. *See Service Engineering Co.,* ASBCA No. 40274, 93-1 BCA ¶ 25,520, *recons. granted in part on other grounds,* 93-2 BCA ¶ 25,885.

not, instruct AEPCO to depart from its normal accounting procedure to separately collect and segregate costs as changes were issued during MT. WHITNEY's availability.

327. Potter priced AEPCO's original sequences for submission to SUPSHIP Portsmouth (tr. 3405). In pricing sequences, Potter used a computer-generated standard pricing form. This form contains four main sections: (a) total labor cost, (b) total material/subcontract cost, (c) burdened cost (G&A at 12%), and (d) profit (at 10%) (*see, e.g.,* R4, tab 70).

328. The labor section of the estimate includes all of the trades, such as electrician, outside machinist, supervision and QA, etc., that are needed. The form has columns for straight time (ST) and overtime (OT) hours, ST and OT dollars, as well as "LOCAL DISRUPTION" and "CUMULATIVE DISRUPTION" dollars. To the total labor hours estimated, Potter would add a 20% "DOWNRIVER" factor[37] and a cost for the time for estimating the sequence. (*See, e.g.,* R4, tab 70)

329. Potter's estimates were not without basis in fact. By the time he estimated the sequences, 99% of the work efforts "were done" (tr. 3487). In some cases, the labor hours estimated were based on the hours recorded in AEPCO's condition reports that gave rise to the sequences (tr. 3501). Potter estimated the labor hours based on his own extensive experience in "accomplishing the exact same task myself as a mechanic." He judged the MHs required by asking "if I was on the deck plate, I could do it [in so many hours]." (Tr. 3443) To get a sense of what the actual work entailed, Potter would also consult with his supervisors on the deck plate (tr. 3405-06).

330. Potter's standard pricing form included a factor of 5% for local disruption and 10% for cumulative disruption (tr. 3492, 3496). The 5% and 10% factors were used when Potter was himself a SUPSHIP Portsmouth negotiator. Potter testified that he used the 5% and 10% disruption factors because "[t]hat's a number that I thought SUPSHIP would accept." (Tr. 3524) He also testified that if he did not believe local and cumulative disruptions were involved, he would not zero out the local and cumulative disruption columns in his estimate until "when we get ready to settle it, I would just knock it out if I didn't think it should be in there" (tr. 3493).

331. To the labor hours estimated, Potter applied the applicable forward pricing labor rate ($13.30) to arrive at labor dollars. Overtime was priced at "time and a half." (*See, e.g.,* R4, tab 70; tr. 3407, 3828)

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[37] Since the job was performed at the Navy's facility not AEPCO's facility, the 20% "Downriver" factor was an "offsite differential" to compensate AEPCO for travel time "getting to the job and from the job back" (tr. 3411-12).

332. To the direct labor cost, Potter would add a labor overhead of 128%, also based on the applicable forward pricing rate, to arrive at the total labor cost (*see, e.g.*, R4, tab 70).

333. The material part of Potter's estimates has two components: (1) direct material required for the sequence, and (2) subcontract, if required (*see, e.g.*, R4, tab 70). Potter's standard pricing form does not contain a line item for "consumables." In estimating material costs, Potter used either catalog prices or "historical prices" based on his familiarity with the work involved (tr. 3407).

334. To the direct material/subcontract cost, Potter would add a 3.88% factor for "MATL/SUB HAND'NG" and a 15% factor for "SUB QA/SUPV" to arrive at a "TOTAL MATERIAL/SUB COST" (*see*, *e.g.*, R4, tab 70). The 3.88% "MATL/SUB HAND'NG" rate was based upon the applicable forward pricing rate (R4, tab 284 at 12). The 15% "SUB QA/SUPV" rate was also based upon the applicable forward pricing rate (*id.*, at 11).

335. To the total direct job cost (labor, material and subcontract), Potter applied a 12% G&A rate (*see*, *e.g.*, R4, tab 70). This rate was based on the applicable forward pricing rate (tr. 3408).

336. To the total burdened cost of a sequence, Potter applied a 10% profit to arrive at the grand total for that sequence (*see*, *e.g.*, R4, tab 70).

337. On the Navy's side, ship surveyors would normally prepare the initial estimates and forward them to ACO Stroud (tr. 3533-34). If there were a question about the surveyor's estimate, ACO Stroud would discuss the estimate with the surveyor or an engineer. If he could not reach an agreement with Potter, a "scoping session" would be convened. (Tr. 3534) ACO Stroud testified as far as material costs were concerned, surveyors "just know" because "a lot of our work is repetitious from one ship to the other." He could also check with SUPSHIP Portsmouth's material department or ask to see AEPCO's purchase order for the item. (Tr. 3535-36)

338. Because he received his training from Potter when he was a ship surveyor, ACO Stroud testified that he knew Potter would include 5% and 10% for local and cumulative disruptions (tr. 3538). ACO Stroud testified if there were local and cumulative disruptions, SUPSHIP Portsmouth would include such costs in its estimates also (tr. 3498). Potter testified the topic of local and cumulative disruptions was not discussed with ACO Stroud. According to ACO Stroud, "It's more or less an unwritten rule that when we make a settlement, it includes everything" (tr. 3497). The Navy has not objected to the use of the 5% and 10% factor for local and cumulative disruption in pricing the unresolved formal sequences.

339. During negotiations between ACO Stroud and Potter, labor hours would typically be the main topic of discussion. According to Stroud, material was not a major topic because "I can always get his purchase order." (Tr. 3550-51) The DCAA audit report did not question any material cost for any of the unresolved formal sequences (totaling $14,696) (R4, tab 284, Schedule A at 4).

340. In developing its estimates for a sequence, SUPSHIP Portsmouth used a FAS System that automatically applied the applicable forward pricing rates (tr. 3535).

341. AEPCO's claim (updated REA of 30 April 2001) sets forth the amount of equitable adjustment sought for each of the 29 "UNAGREED [sic] FORMAL CHANGES." The narrative section (§ 5.1.3) of AEPCO's claim states that the total amount claimed ($557,396) did not include "delay or other impacts" but included "336 manhours for local disruption and 576 manhours for cumulative disruption." A footnote states that the entitled amounts are based on pricing the changes at the calendar year 2000 rates approved by the Supervisor after submission of the original proposal plus a 15% profit. (R4, tab 500-5 at GOV012071-72) Prior to the hearing on these appeals, AEPCO moved for summary judgment on certain issues. The Navy cross moved for summary judgment contending that the actual costs incurred rather than the 23 January 2001 forward pricing rates should be used to price the claim. In our decision issued on 21 January 2003, we held that "AEPCO is not entitled to use the 23 January 2001 forward pricing rates to price its claim, and actual incurred costs, to the extent reasonable, allowable and allocable, shall be used in effecting any equitable adjustment proved." (*See AEPCO*, 03-1 BCA at 158,991) As a result of our summary judgment decision, AEPCO revised its claim. A comparison of the amounts originally claimed and as revised is set out in the table below:

Sequence No.	Claim (30 April 2001)	Revised Claim
23G[38]	$83,156	$75,742
31G	21,746	19,419
37G[39]	28,025	11,875
42NG	15,555	14,866
44G	15,135	13,316
46G	21,898	19,277
54G	12,347	11,042
56G	19,311	17,083
57G	17,724	17,387
58G	30,940	24,688
59G	9,965	8,814
60G	15,405	13,608
61G	2,592	2,308
62G	3,571	3,158
63G[40]	0	0
64G	591	521
65G	9,883	9,082
66G	6,712	6,127
67G	3,314	2,986
68G	57,879	51,658
69G	16,335	14,497
70G	130,267	130,177
71G	26,205	23,637
72G	-30,459	-30,459
73G	7,132	4,061
74G	-1,321	-1,321
75G	23,463	17,721
76G	-1,512	-1,512
77G	11,537	7,263
TOTALS	$557,396	$487,021

(R4, tab 500-5 at GOV012072; app. quantum br., appendix A at 2 of 60)

[38] We have decided there is no entitlement for Sequence No. 23G.

[39] On remand for final calculation of quantum, the parties are reminded that Sequence Nos. 37 and 57 were tentatively settled between Potter and Stroud in July 2000 as a package for $14,978 because they involved procuring the same pump manufacturer technical representative for light off and sea trials (tr. 3429-30; R4, tab 65).

[40] Sequence Nos. 58G and 63G were treated as one item. AEPCO's price proposal showed Sequence No. 63G was for "no cost." (Tr. 3452-54; R4, tab 76)

342. AEPCO's claim was audited by DCAA. DCAA issued Audit Report No. 6221-2001J17200.001 (the audit report) on 3 October 2001 (R4, tab 284). In auditing AEPCO's claim, the DCAA auditor requested technical assistance in determining whether the labor hours claimed for the unresolved formal sequences were reasonable. She did not receive such assistance. Consequently, the audit report did not question the reasonableness of the labor hours Potter estimated for each of the 29 unresolved sequences. (Tr. 3572-73)

343. The parties differ as to the proper methodology to use for pricing the unresolved formal sequences. Because AEPCO did not accumulate costs by sequence, it relied on Potter's original estimates. The formula AEPCO used is essentially the same formula Potter used. (*See* app. quantum br., appendix A at 3-31 of 60; tr. 3836) Neither DCAA nor Cummings, the Navy's expert, challenged the reasonableness of the direct labor hours and material costs Potter estimated.[41]

344. Cummings proposed a different formula for pricing each of the unresolved formal sequences, based on the idea that the prices Potter and ACO Stroud negotiated and settled upon were more reflective of the labor hours required to do the work. The Navy's computations of equitable adjustment of each of the 29 unresolved sequences (including Sequence Nos. 72G, 74G and 76G which are deductive changes) are shown in exhibit 2003 at Q-4, and exhibit 2031.

345. As reflected in ex. 2003 at Q-4, Cummings computed an "Equivalent MH" for each of the sequences. The "Equivalent MH" is derived by applying to the MHs Potter estimated a ratio of the price he estimated to the price he and Stroud agreed upon in July 2000. According to Cummings, the results constituted "our calculation of how many hours were being settled when they were signed" (tr. 3897).

346. For example, for Sequence No. 31G, Potter estimated AEPCO would require 362 ST, OT, local and cumulative disruption MHs to accomplish. Since the parties settled this sequence for $14,000, and AEPCO's proposal was for $16,895.17, Cummings obtained an "Equivalent MH" of 300 MHs by applying a ratio of 14:16.8 to the 362 MHs proposed. (Ex. 2003 at Q-4) After Cummings computed the "Equivalent MHs" for all of the unresolved formal sequences, DCAA applied the audited-accepted labor rate of $13.72, labor overhead rate of 146%, material handing overhead rate of 3.7%, and G&A rate of 12% (applied on a value-added base) to arrive at what the Navy believes should be the equitable adjustment for each unresolved formal change. (Ex. 2031; tr. 3898)

347. AEPCO objects to the Navy's method because Cummings did not determine what would be reasonable in terms of labor hours to perform the changed work and

[41] DCAA did challenge several of the add-on factors Potter used.

argued that it accepted lesser amounts because it needed cash (app. quantum reply br. at 3-4).

348. Which formula to use is ultimately a judgment call. Of the two formulas proposed, we believe basing calculations on Potter's estimate is more supportable for the following reasons. First, after observing Potter testify on numerous occasions over the course of the hearing, we find him to be a credible witness. Second, Potter had extensive deck-plate (over 30 years), contracting and negotiation experience. Third, when Potter estimated the MHs for the sequences, the work involved was 99% completed, and some of the labor hours proposed were derived from the condition reports submitted. Moreover, Potter's estimates were not done in a vacuum; they were done in consultation with his deck-plate supervisors who were in a position to know what took place. Fourth, since the Navy had its own estimate on each of the sequences issued, we believe the Navy would have challenged Potter's estimates had it believed that any of them were not reasonable. Fifth, neither party provided the details of the negotiation, and we simply do not know what motivated the parties to agree or disagree (in the case of Sequence Nos. 58G, 63G and 68G). Thus, applying the Cummings ratio would appear to us to be rather arbitrary. For the foregoing reasons, we find short of proving actual cost incurred for each sequence, Potter's estimates provide the best available evidence for pricing the unresolved formal sequences.

(A) Labor Costs

(i) Labor Rate

349. AEPCO's claim priced labor in accordance with SUPSHIP Portsmouth's 23 January 2001 forward pricing letter—a blended trade and supervision rate of $15.61 (*see AEPCO*, 03-1 BCA at 158,988, ¶ 44). DCAA's 3 October 2001 audit report divided AEPCO's personnel into two categories for purpose of applying labor rates: (1) trade personnel and (2) supervision/QA personnel. For trade personnel, it accepted a straight-time (ST) rate of $12.09, and overtime (OT) rate of $18.65. For supervision/QA, it accepted a ST and OT rate of $13.48. (R4, tab 284 at 9) In the ship repair industry, however, trade and supervision MHs normally are not separately priced, but a blended or composite rate is developed (tr. 3838). As a result of the Board's 21 January 2003 summary judgment decision in which we held "AEPCO is not entitled to use the 23 January 2001 forward pricing rates to price its claim," AEPCO has revised the labor rate it claimed (*see AEPCO*, 03-1 BCA at 158,991; R4, tab 287 at 73).

350. According to Willis, even though AEPCO's salaried employees who worked overtime on MT. WHITNEY did not receive additional pay, under AEPCO's "practice," they would receive "compensatory time off" after work on the vessel was finished. Based on his finding that AEPCO's salaried employees performed "2,332 labor hours of uncompensated . . . overtime" work on MT. WHITNEY, Willis considered it "reasonable

to impute the resulting costs to the Job Order." Willis computed a blended ST labor rate of $13.61[42]. He suggested that an alternative method taking into account "uncompensated salaried overtime" would be "to add the value of the salaried employee's overtime labor hours into the pool of direct labor dollars." (R4, tab 287 at 73 of 77) AEPCO's Chief Financial Officer (CFO) acknowledged, however, "there's no overtime for exempt employee[s]," and "AEPCO does not have a comp time policy." She testified that sometimes based on "mutual understandings" between the "managers and employees, . . . if an employee works excessive hours, the manager will give the employee a few days off the following week." (Tr. 3828-29)

351. The DCAA auditor testified that AEPCO's records show salaried employees worked "more than standard hours" (tr. 3613), but there is no indication that they were paid more than their salaries (tr. 3616). She testified that for salaried employees, "unpaid overtime" is "an unfortunate phrase used to describe an accounting problem, because no salaried person is actually ever unpaid [for overtime]" (tr. 3619-20), since "[a] salary [sic] person receives his salary for a job. He does not receive it for hours worked" (tr. 3617). The DCAA auditor also testified that salaried employees' overtime records were "not particularly relevant" to what she was doing because she was interested in "[a]ll the hours recorded, all the dollars recorded" (tr. 3613). She explained that salaried employees working overtime was not a problem in computing the average actual labor rate AEPCO experienced on the contract because "[s]alaried people don't get paid by the hour," and AEPCO's pay system for salaried employees is not based on a 40-hour week (tr. 3620).

352. On 15 June 2001, over a year after its work was substantially completed, AEPCO issued a JOB SUMMARY REPORT on the MT. WHITNEY job order. In this report, AEPCO shows that it incurred $534,347.78 in total labor cost, and it incurred a total of 38,953.8 labor hours. The report calculates $13.72 ($534,347.78/38,953.8 MHs) as the average actual labor rate for the MT. WHITNEY job order. Neither the Navy nor DCAA has disputed the numbers shown in the report. The DCAA auditor determined that this $13.72 overall average rate should be used "for all employees, all kinds of hours, all kinds of overtime" (tr. 3811), and should be used "whether they're exempt, nonexempt, whether it's overtime for nonexempt people . . . that figure is $13.72, and you don't have to know anything else" (tr. 4502). In its brief, the Navy argues the $13.72 rate is based on AEPCO's actual job performance costs and "should be the rate applied to any hours on which the Board determines entitlement" (gov't quantum br. at 16)

353. As AEPCO's quantum brief explains, a labor rate is the product of a ratio in which labor dollars is the numerator and labor hours the denominator. When salaried employees work in excess of their normal hours, the numerator remains constant, but the

[42] Presumably, this would mean the OT rate would be 1½ times $13.61 or $20.42 (*see* gov't quantum reply br. at 8).

denominator increases because more MHs are worked. (App. quantum reply br. at 30-31) AEPCO emphasizes in its brief that "it is not seeking to be paid the uncompensated overtime its employees were forced to incur. It is only asking that the uncompensated overtime be excluded from the pool of hours used to compute its actual hourly labor rate." AEPCO asserts that only in this manner will a fair, undiluted rate be achieved. (App. quantum br. at 14, n.11)

354. AEPCO's argument overlooked the fact that it accomplished $534,347.78 worth of work without having to actually pay out uncompensated overtime. Moreover, AEPCO has not proved uncompensated overtime had actually been incurred as a cost to the company.

355. Based on AEPCO's own post-availability JOB SUMMARY REPORT on the MT. WHITNEY, we find that the actual labor rate of $13.72 should be used for all equitable adjustments.

(ii) Labor Overhead

356. AEPCO's standard pricing form for estimating formal sequences used 128% of direct labor cost for labor overhead (*see* R4, tabs 63-90). AEPCO's claim applied a 146% labor overhead to all direct labor cost (R4, tab 500-6 at GOV012123). The 146% rate was derived from the applicable forward pricing rate in effect for the contract year 2000 (*id.).* DCAA's 3 October 2001 audit report accepted the 146% rate (R4, tab 284 at 10). In Section J-2-A of her work papers, however, the DCAA auditor documented that for "FISCAL YEAR ENDING 12/31/00,"[43] AEPCO's total overhead costs of $2,176,024.52, when applied to the direct labor base of $1,470,609.84, yielded an incurred cost labor overhead rate of 147.97% (R4, tab 584 at GOV008681). We find that AEPCO is entitled to a labor overhead rate of 148% of direct labor cost for the unresolved sequences and other equitable adjustments to which it is entitled.

(B) Material, Subcontract And Consumables

357. The material costs incurred or that would have been incurred (for deductive changes) fall into three categories: (1) purchased materials, (2) subcontracts, and (3) consumables.

(1) Purchased Materials

358. With respect to purchased materials, AEPCO claimed $14,696 for all 29 unresolved sequences. DCAA did not question this cost. (R4, tab 284 at 15)

[43] AEPCO's fiscal year coincides with the calendar year (tr. 4181).

(2) Subcontract Costs

359. With respect to subcontract costs, AEPCO claimed $164,103 for all 29 sequences. Of this amount, DCAA questioned $18,874. The questioned costs arose from five of the unresolved sequences:

Sequence No.	Amount
37G	$9,525
58G	4,500
66G	2,000
67G	224
68G	2,625
Total	$18,874

(R4, tab 284 at 15-16)

360. DCAA found that the $9,525 claimed under Sequence No. 37G was a duplication of an amount paid for services of a technical representative from Coffin Turbo Pump, Inc. (R4, tab 284 at 16, Note a). The $4,500 claimed under Sequence No. 58G was for a Si-Tech radiographic inspection that was cancelled (*id.*, Note b). AEPCO acknowledged that the $9,525 relating to Sequence No. 37G and the $4,500 relating to Sequence No. 58G should both be deleted from the claim (tr. 3653).

361. DCAA questioned $2,000 subcontract cost for Sequence No. 66G because it did not relate to that sequence. DCAA also questioned the amount because it was also claimed under Constructive Change C.12. (R4, tab 284 at 17) Under Constructive Change C.12, we grant $1,918 for asbestos-related work performed by Arcon on 11 March 2000 (*infra*). Because the $2,000 claimed for subcontract work was being claimed elsewhere, and had nothing to do with Sequence No. 66G, the amount should be removed from the material costs claimed under Sequence No. 66G.

362. DCAA questioned $224 relating to Sequence No. 67G because the amount "is the difference between the claimed amount of $2,000, which was estimated, and the invoiced amount from Arcon, Inc. of $1,776" (R4, tab 284 at 17, Note d). Absent rebuttal from AEPCO, we find the subcontract cost claimed under Sequence No. 67G should be adjusted to $1,776.

363. DCAA also questioned $2,625 in material cost relating to Sequence No. 68G. According to DCAA, "the documentation provided does not support a connection to this sequence 68-G." DCAA stated further that the amount claimed is for overtime and "is also claimed on Constructive Change C.12." (R4, tab 284 at 17, Note e) Absent

rebuttal from AEPCO, we find the $2,625 in material cost should be removed from Sequence No. 68G.[44]

364. We find, based on the record, that DCAA properly adjusted AEPCO's subcontract costs of five of the unresolved formal sequences by $18,874.

Material/Subcontract Handling Rate

365. AEPCO's claim applied a 3.88% material/subcontract handling rate to direct material and subcontractor dollars (R4, tab 500-6 at GOV012123). This rate was based on SUPSHIP Portsmouth's 23 January 2001 forward pricing letter. The 3 October 2001 audit report accepted a 3.70% rate (R4, tab 284 at 12; tr. 3792). The auditor's work papers show that for the FY ending 31 December 2000, AEPCO's actual incurred material/subcontractor handling rate was 3.70% (R4, tab 584J at GOV008682). AEPCO has not objected to this rate, and appears to have accepted this rate in its final pricing of the 29 unresolved formal changes (app. quantum br., appendix A at 3-31). Accordingly, we find the appropriate material/subcontract handling rate to use in pricing each of unresolved formal sequences and other equitable adjustments to which AEPCO is entitled to be 3.70%.

QA Supervision of Subcontractor

366. Where a subcontractor was involved in performing formal changes, AEPCO applied a 15% charge of subcontract cost for ensuring that subcontract work complied with the quality requirements of the job order. AEPCO characterized this charge as "SUB QA/SUPV"; it was a line item on AEPCO's standard pricing form. (*See* Potter Witness Notebook-Quantum Issues, tabs 63-90)

367. DCAA's 3 October 2001 audit questioned "the entire amount claimed for QA/Supervision of subcontracts, and consequently all of the hours [836 MHs] implicit in the amount." The audit stated that "[t]he contractor did not supply an adequate basis for the factor that can be objectively verified in its books and records." (R4, tab 284 at 15)

368. In situations where a subcontractor was required to perform a formal change, a certain amount of oversight or supervision on AEPCO's part was inevitable because it was ultimately responsible to SUPSHIP Portsmouth. The degree of supervision must necessarily depend on the nature of the work and the subcontractor involved. We find that AEPCO has supplied adequate reasons for such a charge; the only remaining question is whether the 15% factor is reasonable.

[44] In Constructive Change C.12, we denied AEPCO's overtime claim because it has not been shown that the Navy was responsible for the cost.

Inasmuch as AEPCO had used a 15% "SUB QA/SUPV" charge in its standard pricing forms where subcontractors were involved, and inasmuch as SUPSHIP Portsmouth did not seem to have a problem with AEPCO charging 15% of subcontract costs for supervision in such circumstances throughout the availability until DCAA raised the issue of verification in AEPCO's books and records, we find a 15% SUB QA/SUPV charge should be allowed in pricing the unresolved sequences and other equitable adjustments to which AEPCO is entitled because the factor appears to be reasonable where subcontractors were a part of AEPCO's performance for which it would ultimately be responsible.

(3) Consumables

369. The third category of AEPCO's total material costs is "consumables." Consumables cover tools and equipment such as "[o]xygen acetylene-burning welding rods, fuel for vehicles, coveralls, paint brushes, tape . . ." (tr. 3407-08). Consumables also include rags and bags (tr. 3488, 3523). A full list of consumables is set out in AEPCO's claim (*see* R4, tab 501-H at GOV012551-52).

370. When AEPCO needed consumables for MT. WHITNEY, it did not purchase them specifically but drew them from the stock it maintained (tr. 3408).

371. As shown by its Material Status Report, AEPCO would order consumables under the MT. WHITNEY contract to replenish its depleting stock (tr. 3520-22; ex. 2003, tab S-7 at 12). As Potter explained:

> Say, for example, that on the Mount Whitney job, I pulled 50 pounds of rags, okay? I will buy 50 pounds of rags on the Mount Whitney job, but that particular 50 pounds may get used on another ship.

(Tr. 3488)

372. Potter's standard pricing forms do not have a line item for consumables (*see* R4, tabs 63-90). There is no evidence that AEPCO included any cost for consumables in its proposals for any formal sequences submitted to SUPSHIP Portsmouth. Nor is it clear that AEPCO included any cost of consumables in pricing its equitable adjustment claim relating to the unresolved sequences. There is a line item entitled "CONSUMABLES @ $1.00/MH," the "DOLLARS" column for the line item, however, reads "INCL." (app. quantum br., appendix A at 3-31 of 60). We note that AEPCO included $89,290 worth of "store" material in its original proposal (finding 26). It is evident, however, that AEPCO

priced in the $1/MH cost for consumables for its constructive change claims.[45] For example, for Constructive Change C.1, AEPCO claims 160 labor hours for various trades, and it automatically claims $160 in consumables as a part of the material costs (app. quantum br., appendix A at 33-60).

373. DCAA's 3 October 2001 audit questioned the entire $11,450 amount claimed for consumables. The audit stated:

> We questioned the entire factor used to calculate the amount. The contractor provided no support, not even an analysis based on experience on this job order or on other contracts. The contractor has never used such a factor in pricing of initial bids or change orders for ship repair work. The items described are charged to the overhead, which is applied to labor. Thus, the use of the factor results in double counting.

The audit also reported that the $1/MH factor was based on "the judgment of the contractor's consultant," and even though DCAA requested objective support such as in-house experienced-based study or published industry studies, none were provided. (R4, tab 284 at 10-11)

374. FAR 31.201-1(a), COMPOSITION OF TOTAL COST, provides that "In ascertaining what constitutes a cost, any generally accepted method of determining or estimating costs that is equitable and is consistently applied may be used." We are not persuaded that a $1/MH factor charged for consumables is equitable because AEPCO has not demonstrated that it bore any nexus to the consumables actually used on the MT. WHITNEY job order. Moreover, AEPCO has not established that the disputed consumable factor was consistently applied. AEPCO also has not rebutted DCAA's finding that the items described as consumables were actually charged to overhead. Consequently, we find consumables should not be charged to the MT. WHITNEY contract as a direct cost.

(C) G&A

375. AEPCO's claim applied a 12% G&A rate to a total cost input base (R4, tab 500-6 at GOV012123). The 12% rate was based on SUPSHIP Portsmouth's 23 January 2001 forwarding pricing letter (R4, tab 284 at 12-13). The 3 October 2001 DCAA audit accepted the 12% G&A rate but found that "[t]he correct base for the application of the

[45] We recognize we are dealing with unresolved formal sequences here. However, "consumables" is one of the three categories of material costs claimed, and we address the topic here as a matter of convenience.

G&A rate is total cost less material, subcontracts, and G&A expense, often referred to as a value-add[ed] base" (R4, tab 284 at 17).

376. A total cost input base includes "all costs incurred, less G&A, B&P, and IR&D expenses." A value-added base includes "total incurred cost, less G&A, B&P, IR&D expenses, direct material and direct subcontracts." Because the total cost input base is a larger base, applying a G&A rate to that base would result in a larger G&A payment than would a value-added base. (Tr. 3793-94) AEPCO's CFO acknowledged that AEPCO has used a value-added base for G&A since 1996 (tr. 3830).

377. The DCAA auditor's work papers show that for FY ending 31 December 2000, AEPCO's actual G&A rate when applied to a value-added base is 12.07% (R4, tab 584J at GOV008683-84). The Navy contends that "[t]o use a total cost input base, the base must be recomputed, and would be a lower rate" (gov't quantum reply br. at 7).

378. Because applying a 12.07% G&A rate to a value-added base is consistent with AEPCO's established accounting practice, and because the 12.07% rate is reflective of the actual costs incurred, we find that in pricing the unresolved formal changes and other equitable adjustment to which AEPCO is entitled, the parties should use 12.07% G&A rate applied to a value-added base.

(D) Profit

379. AEPCO's claim sought a profit rate of 15% (R4, tab 500-6 at GOV012123). DCAA's 3 October 2001 audit states "We do not question profit, per se, as profit is entirely within the realm of the contracting officials." The audit report noted that AEPCO's original pricing sheets for formal changes show "the use of a 10% profit percentage." (R4, tab 284 at 14)

380. AEPCO argues that it was placed under extraordinary pressure in performing Job Order No. 0072 when the Navy shortened the performance period by 13 days; when the Navy materially changed the quality assurance requirements for P-1 piping by requiring RT; and when both parties knew that the contract was being performed during a period of intense activity in the Hampton Roads regions when it was very difficult to locate and hire additional skilled labor to support the required acceleration and expanded scope of the contract. AEPCO argues that "[g]iven these difficult circumstances, and in light of AEPCO's exemplary performance in achieving delivery of the ship in time to meet its next operational commitment," it is entitled to receive 15% profit. (App. quantum br. at 24-25)

381. Because of the short time frame within which RAV work must be completed, Job Order No. 0072 carries inherent risk. In this case, that risk was exacerbated by the addition of four shipalts three weeks before bid opening in the midst of the

Christmas/New Year holidays, and the imposition of the PCD. Even though 70 additive sequences were issued,[46] our review of them indicates that, with the exception of the fallout resulting from Sequence No. 23G, the other sequences were fairly routine.[47] While we cannot say AEPCO bore no responsibility for the increased costs experienced on the project, we agree that it exerted extraordinary effort in delivering the vessel for sea trials. Weighing the entire record, we find that a 15% profit rate is appropriate for pricing the unresolved formal changes.

Equitable Adjustment Methodology for Pricing the Constructive Changes

382. Unlike the formal sequences that were initiated by either SUPSHIP Portsmouth or AEPCO, the constructive changes claimed were the result of Willis' involvement. He testified that the constructive changes were developed as a result of placing a team of people, including himself, at AEPCO's shipyard for an extended period "reviewing all of the contract documents and records." The team "reconstructed the entire period of performance to determine matters which should have been, in our opinion, included as formal contract changes." (Tr. 4178)

383. Also unlike the formal changes, Willis and his team "developed estimates for each constructive change of the labor, material, subcontract requirements that were required to accomplish that change." After Willis developed the estimates for each constructive change claimed, he "consulted with Mr. Potter and with AEPCO personnel as to whether those estimates . . . were reasonable." (Tr. 4179) Willis had to resort to estimates because "[t]here was no record kept" (tr. 2811). No records were kept because AEPCO personnel apparently did not at the time consider the work encompassed by the constructive changes claim to have been constructive changes. Willis testified that he was the "final determinant as to the final price that was included in each estimate," and that he "broke the constructive change down into elements, priced it exactly as the parties had priced formal changes, using exactly the same factors and the same percentages and the same ratios," but applying a 15% profit (tr. 4180). Willis included no disruption in his estimated amounts for the constructive changes because he claimed disruption separately in AEPCO's total claim package (tr. 4180-81).

384. As itemized in its quantum brief, AEPCO's final claim for constructive changes totaled $533,984. In estimating the quantum of adjustment, AEPCO used a $13.61 labor rate, a 148% labor overhead rate, $1.00/MH for consumables, a 3.70% rate

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[46] As previously mentioned, of the 77 sequences issued, 3 were deductive, and 4 were voided.

[47] Except with respect to Sequence No. 23G, neither party went into the substance of the sequences issued at the hearing. Our determination of the work required is based on our review of the scope of work as described in the sequences issued by SUPSHIP Portsmouth (Potter's Witness Notebook on Quantum Issues, tab 64-90).

for material and subcontractor handling rate, a total cost input G&A rate of 12.10% and a profit rate of 15%. QA supervision and OT MHs were included as a part of the total labor hours claimed. (App. quantum br., appendix A, at 32-60)

385. We are not persuaded the same estimating methodology used for pricing the unresolved formal sequences can also be used for pricing constructive changes. We observe that most of the deck-plate witnesses, including Potter, AEPCO called to support its case on constructive changes did not have a firm grasp of the MHs involved (*see*, ***e.g.***, findings 243, 247). In short, we do not find Willis' MHs estimates helpful because they supposedly came from the same witnesses who professed ignorance at the hearing. Unlike Potter's estimates on the unresolved formal sequences, we are not satisfied that Willis' MHs estimates on the constructive changes reflect reality. Of the 15 constructive changes claimed, we have found partial recovery for Constructive Change C.3, C.4, C.12, C.13 and C.15. In all but Constructive Change C.13, the quantum of adjustment can be determined without resorting to Willis' estimates. In Constructive Change C.13, the number of MHs claimed was small, and lacking other evidence, we accepted Willis' estimate.

Equitable Adjustment Methodology For Pricing Acceleration

386. Willis identified two main causes that precipitated acceleration. The first cause related to the imposition of the PCD; the second related to "the massive change in the undertaking by changing the inspection and fit up and everything on the main feed piping." (Tr. 4215-16)

387. As to the first cause of acceleration, we said in the entitlement part of this decision:

> . . . Because the Changes clause of the contract authorized certain specified changes, including "(4) Time of commencement or completion of the work," and because the imposition of the PCD occurred at the very beginning of the availability, prior to the occurrence of any delay caused by AEPCO, we hold that AEPCO is entitled to an equitable adjustment for acceleration as a directed change under the Changes clause.

As to the second cause of acceleration, we said:

> Because the contract required AEPCO to properly weld, RT, and rework defective MFP P-1 piping butt joints, and because SUPSHIP Portsmouth properly inspected and rejected the defective welds, we hold that AEPCO is not

entitled to recover the cost of acceleration to comply with the foregoing requirements.

388. In Exhibit E of its claim, AEPCO sought $197,400 for acceleration (R4, tab 501-E at GOV012490-500). In pricing AEPCO's acceleration claim, Willis found that AEPCO used "approximately 11,138 premium manhours" (*id.* at GOV012493). Premium MHs fall into two categories: (1) AEPCO OT labor hours, and (2) temporary OT labor hours.[48] In pricing AEPCO's acceleration claim, Willis assumed that the Navy was solely responsible for all acceleration (tr. 4204).

389. In pricing formal and constructive changes, Willis assumed that 23% of the labor hours claimed for each formal and constructive change involved OT and therefore premium rates. For example, in pricing Constructive Change C.3, involving excessive production meeting requirements, Willis estimated that the ship superintendent spent 30 additional MHs attending production meetings. Willis added 3 MHs as "O.T. PREM. MH @ 23% & 1.5X".[49] A footnote to the computation sheet explains "Computed O.T. Premium MH *does not represent time worked. It is only to recover dollars paid out*" (emphasis added) (*see* R4, tab 501-C at GOV012353).

390. We find Willis had to resort to his method of distributing OT premium labor hours because AEPCO's project record provided him with no means of determining what work took OT to accomplish. He thus assumed that all work was responsible for a share of the OT premium AEPCO had to pay.

391. After distributing 3,435 OT MHs to all the formal and constructive changes, Willis then deducted 3% of the 11,138 premium MHs on the basis that AEPCO should have anticipated some OT when it bid the job (tr. 4209). As reflected in AEPCO's claim, Willis attributed the balance of the OT premium hours (6,780) to acceleration:

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[48] In the shipyard industry, many companies hire qualified shipfitters, welders, pipefitters and machinists, etc. Their services are sometimes sold to other shipyards "who need them on an as-needed basis." Upon completion of work, the shipyard that provided the labor would bill the one that used the labor at a pre-established rate. (Tr. 4210)

[49] We know 23% of 30 MHs is 6.9 MHs, not 3 MHs. Since OT pay is a time-and-a-half, Willis simply took half of the 6 MHs, *i.e.,* 3 MHs, as a shorthand way of converting OT MHs to additional ST MHs for purpose of computing labor dollars.

Total Premium MHs	11,138
3% Credit	-923
Claimed in Formal/Constructive Changes	-3,435
Claimed as Attributed to Acceleration	6,780

(R4, tab 501-E at GOV012493)

392. Of the 11,138 OT MHs, Willis found 8,610 were AEPCO OT labor hours and 2,528 were temporary OT labor hours. Based on this breakout, he established an AEPCO OT labor hour to temporary OT labor hour ratio of 77.3% to 22.7%. He applied this ratio to the 6,780 OT MHs to derive a breakout of AEPCO OT labor hours and temporary OT labor hours for acceleration as follows:

AEPCO OT labor hours: 6,780 MHs x 77.3% = 5,241 MHs
Temporary OT labor hours: 6,780 MHs x 22.7% = 1,539 MHs

With this information, Willis applied a $15.61 labor rate to the AEPCO OT labor hours, and a $32.91 labor rate[50] to the temporary OT labor hours to arrive at its claim (including markup) of $197,400. (R4, tab 501-E at GOV012495-500)

393. The DCAA auditor testified that she did not question the methodology Willis used in pricing acceleration (tr. 4229). Of the 11,138 OT hours AEPCO claimed to have been incurred, DCAA accepted 10,264 OT hours. Of the 6,780 OT hours AEPCO claimed to have incurred as a result of acceleration, DCAA accepted 4,872 OT hours. (R4, tab 284 at 26) In not questioning his pricing methodology, we find the auditor was not endorsing Willis' methodology as being proper for use in effecting an equitable adjustment for acceleration. In accepting certain OT hours, we find that DCAA was merely verifying that the OT hours were incurred.

394. Willis' methodology amounted to taking all of the OT MHs incurred on the job, distributing some such hours to each formal and constructive change, and taking the rest and assigning them to acceleration. As for the OT hours assigned to acceleration, Willis made no distinction between OT hours necessitated by the imposition of the PCD and those necessitated by AEPCO's own failure to recognize the requirements of P-1 piping, of RT, and its failure to properly weld and correct the piping butt joints. Willis simply assumed that the Navy was responsible for all of the OT MHs incurred. Moreover, he also made no distinction with respect to which of the two causes of

[50] According to Willis, the actual cost for temporary labor was $32.91 per MH (tr. 4213). He used the full rate for temporary workers because "when AEPCO is billed for a temporary worker on overtime, it is billed at 1-1/2 times the straight time rate" (tr. 4214).

acceleration necessitated the use of temporary labor. Because the methodology AEPCO proposed does not permit us to reach a fair approximation of the amount of acceleration costs for which the Navy is responsible, it is rejected.

395. The record, however, does provide some guidance as to how to price acceleration caused by imposition of the PCD. AEPCO had initially planned to work 8 hours a day, 5 days a week with no OT and no weekend work (finding 283). When AEPCO became aware of the PCD, it immediately went to OT and worked the first weekend (finding 31). When the P-1 piping and RT issues surfaced, AEPCO increased its manning from working 10 hours a day, 7 days a week to working 12 hours a day, 7 days a week (finding 57). These findings, coupled with Potter's testimony that he believed that when the Navy first imposed the PCD, that date could be met with overtime, supports a finding that AEPCO could have met the 13 March 2000 PCD with its then existing MFP work force, working 10 hours each weekday and 20 hours during each of the 9 weekends between 12 January and 13 March 2000. Because the need to hire temporary labor did not stem from the imposition of PCD (findings 284, 297), we find temporary OT labor cost should not be a part of the equitable adjustment for acceleration resulting from the imposition of the PCD.

Quantum – Disruption

396. AEPCO has failed to prove entitlement to disruption costs. Accordingly no equitable adjustment is due.

Quantum – Time-Related Delay Costs

397. AEPCO has failed to prove entitlement to any time-related delay cost, including extended home office overhead. Accordingly, no equitable adjustment is due.

Time Value of Additional Working Capital

398. AEPCO's claim also seeks $128,770 "related to the time value of additional working capital which AEPCO had to supply to perform the added and changed work required by Government" (R4, tab 500-5 at GOV012117). The claim states that the additional capital costs required due to the changes may be broken down into three segments: (1) capital costs incurred during performance of the work (Segment One); (2) financing from the date of work completion until the date of Proposal submission (Segment Two); and (3) financing from the date of Proposal submission until the date of final Proposal settlement (Segment Three). No amount is claimed for (1) and (3) but AEPCO reserved its right to do so. With respect to (2), AEPCO explains the basis of its calculation as follows:

> AEPCO based its computations on the cost of money from the time of completion of work on June 15, 2000 through the April 30, 2001 supplemental proposal submission, a period of ten-and-one-half (10.5) months, is computed at a nominal commercial cost of money rate of eight (sic) percent (9%)[51]. . . .

(R4, tab 500-5 at GOV012118)

399. The 3 October 2001 DCAA audit report questioned the entire amount claimed. Relying on FAR 31.205-20, DCAA found that "the cost is not allowable as a cost of contract performance." (R4, tab 284 at 13)

400. Job Order No. 0072 incorporated by reference DFARS 252.243-7001, PRICING OF CONTRACT MODIFICATIONS (DEC 1991), which provides that "When costs are a factor in any price adjustment under this contract, the contract cost principles and procedures in FAR Part 31 . . . in effect on the date of this contract, apply" (R4, tab 1, solicitation at 34 of 66). FAR 31.205-20, INTEREST AND OTHER FINANCIAL COSTS**,** provides, in part, "Interest on borrowings (however represented), . . . are unallowable."

PART VI.

DECISION ON QUANTUM

The "preferred" method of proving a claim is by the "actual cost method." This method is preferred because "it provides the court, or contracting officer, with documented underlying expenses, ensuring that the final amount of the equitable adjustment will be just that—equitable—and not a windfall for either the government or the contractor." *Dawco Construction, Inc. v. United States*, 930 F.2d 872, 882 (Fed. Cir. 1991), *overruled in part on other grounds*, *Reflectone, Inc. v. Dalton*, 60 F.3d 1572 (Fed. Cir. 1995) (*en banc*); *Cen-Vi-Ro of Texas Inc. v. United States,* 210 Ct. Cl. 684 (1976); *Bregman Construction Corp.,* ASBCA No. 15020, 72-1 BCA ¶ 9411 (board used actual costs where records were available and adopted the best estimate where records were not available).

In this case, DCAA audited AEPCO's claim, and, for the most part, was able to ascertain the actual rates AEPCO experienced while performing work on MT. WHITNEY. In effecting equitable adjustment, therefore, we have accepted the DCAA-determined actual rates. AEPCO, however, did not collect and segregate the

[51] The $128,779 is based on an assumed recovery of $1,635,285, and is calculated as follows: (1) Monthly Interest Rate = 9%/12 Months = .75%/Month; (2) Cost of Money = .75% x 10.5 Months x $1,635,285 = $128,779.

actual labor and material costs for the unresolved formal sequences and the various alleged constructive changes.

Of the 29 unresolved formal sequences, we have decided entitlement in favor of the Navy on Sequence No. 23G. Leaving the three deductive sequences (Sequence Nos. 72NG, 74G and 76G) aside for the moment,[52] the Navy has conceded entitlement on the remaining 25 sequences.

In this case, each of AEPCO's quantum claims for the unresolved formal sequences was supported by an estimate from Potter. We have found that Potter had extensive deck-plate, contracting and negotiation experience both inside and outside the government. The record established that when Potter estimated the MHs for the sequences, the work involved was 99% complete, and some of the MHs proposed were actually derived from the condition reports submitted. Moreover, we have found Potter's estimates were not done in a vacuum; they were done in consultation with his deck-plate supervisors who were in a position to know what took place. With Potter's estimates, and the actual rates verified by DCAA, we conclude there is sufficient evidence for us to make a fair and reasonable approximation of the amount of equitable adjustment due AEPCO on the unresolved formal sequences and the constructive changes for which we have found entitlement.

We believe our conclusion here is consistent with the "something sufficiently close" standard articulated in *Dawco*, 930 F.2d at 881. *See also Service Engineering Company, supra* at 127,111-13 (contractor did not segregate and separately collect actual costs incurred in performing constructive changes; Board accepted experienced estimator's estimates based on his ship check and interviews with those with first-hand knowledge).

Quantum—Unresolved Formal Sequences

With the exception of Sequence No. 23G as to which we have held there is no entitlement, we hold the parties are to price each of the remaining unresolved sequences (including the deductive sequences (72G, 74G, and 76G)) in the following manner: (1) use Potter's original estimate, including down river, estimating, OT, local and cumulative disruption hours, apply a $13.72 labor rate and a 148% labor overhead rate to arrive at total labor cost; (2) use Potter's estimates for material (undisputed), and subcontract cost (removing the $18,874 associated with Sequence Nos. 37G, 58G, 66G, 67G and 68G), and apply a 3.70% rate for MAT/SUB handling, and a 15% rate for SUB QA/SUPV (only where subcontractor was used) to arrive at total material and subcontract cost; and

[52] The same estimating method we discuss herein can be used for deductive changes as well.

(3) apply a 12.07% G&A rate to a value-added base, and a 15% profit to burdened cost to arrive at an equitable adjustment amount for each of the unresolved sequences.

Quantum—Constructive Changes

Of the 15 constructive changes AEPCO claimed (Constructive Change C.14 has 9 subparts, C.14.A to C.14.I), we have found that it has proved partial entitlement for Constructive Change C.3 (Excessive Production Meeting Requirements), C.4 (Added Piping Materials and Installation), C.12 (Uncompensated Asbestos Subcontractor), C.13 (Work Stoppage and Extra Work Due to Discovery of Asbestos on 14 April 2000) and C.15 (Ship's Force Interference with Duplex Strainer Work).

Constructive Change C.3

With respect to Constructive Change C.3, we have found that because SUPSHIP Portsmouth's requirement for AEPCO's general manager and ship superintendent to participate in its daily production meetings between 7 and 30 March 2000 exceeded the requirements of the contract, it is entitled to an equitable adjustment.

Although AEPCO's ship superintendent was a salaried employee, he was also a direct-charged employee. The DCAA has found that his time could properly be charged to Job Order No. 0072. We hold that AEPCO is entitled to recover the 30 MHs he spent in attending the 20 production meetings. AEPCO is not entitled to recover the 3 MHs of overtime premium it claimed. The evidence shows that the 3 MHs of OT premium "does not represent time worked," but was included simply to "recover dollars paid out." (Finding 389) We have denied such a claim that could not be tied specifically to a change but was based on a devised allocation system. *NavCom Defense Electronics, Inc.*, ASBCA Nos. 50767 *et al.*, 01-2 BCA ¶ 31,546 at 155,787, *aff'd and rev'd in part on other grounds*, 53 Fed.Appx. 897 (Fed. Cir. 2002). AEPCO has not proved that it is entitled to any material and material handling costs. In effecting an equitable adjustment for this constructive change, the parties are to use the rates we found applicable.

AEPCO has not claimed any MHs for attending the daily production meetings for its general manager because his time was charged to its overhead account. We conclude, however, that AEPCO is entitled to recover $176.64 (($0.32[53] x 24 miles) x 23), the cost of the general manager making 23 round trips to and from the vessel to attend the daily production meetings.

[53] The $0.32 a mile rate is the "federal rate . . . allow[ed] . . . at that time for the cost of operating a vehicle" (tr. 4189).

Constructive Change C.4

With respect to Constructive Change C.4, we have held that AEPCO is entitled to an equitable adjustment for the piping materials it purchased as reflected in R4, tabs 118, 119, 124, 126, 127, 128, 129, and 131 to correct drawing material list quantities or dimensions (*see* finding 128). Since we are unable to determine from the record the cost of materials purchased, we remand to the parties to determine the quantum of adjustment using the rates that we found applicable in pricing the unresolved formal sequences. The costs of the piping materials purchased are to be based on actual costs incurred.

Constructive Change C.12

AEPCO has provided proof by way of invoices and canceled checks that it had paid Arcon for the asbestos-related services rendered. Based on these invoices and canceled checks, we conclude that AEPCO is entitled to recover the following amounts:

Arcon CRs	Amount
CR No. 001 REV	$3,780 (finding 178)
CR No.004	1,918 (finding 179)
CR No. 005	2,836 (finding 182)
CR No. 007	1,352 (finding 186)
CR No. 012	476 (finding 189)
Total	$10,362

On remand, the parties are to price this constructive change using the rates we found applicable in pricing the unresolved formal sequences.

Constructive Change C.13

We have found that AEPCO is entitled to 69 standby MHs while asbestos abatement was being conducted on 14 April 3000. On remand, the parties are to price this constructive change using the rates we found applicable in pricing the unresolved formal sequences.

Constructive Change C.15

With respect to Constructive Change C.15, we have held that AEPCO lost 12 ST MHs on 13 January 2000 when work of one supervisor, one leadman, and two laborers to remove the duplex strainer shield was suspended for three hours. On remand, the parties are to price this constructive change using the rates we found applicable in pricing the unresolved formal sequences.

Quantum – Directed Change Requiring Subcontractor to Correct and Complete MFP Welding

We have found that AEPCO incurred $38,299.81 in actual cost as a result of being directed to subcontract with NORSHIPCO to correct and complete the rejected MFP welds (finding 89). Accordingly, we hold AEPCO is entitled to an equitable adjustment in the amount of $38,299.81 plus applicable markups at the rates we found applicable for the unresolved formal changes but only to the extent this amount exceeds what AEPCO would otherwise incur in correcting and completing MFP welding.

Quantum – Acceleration

SUPSHIP Portsmouth's Deputy Director of Contracts and ACO Stroud both acknowledged that a sequence should have been issued to compensate AEPCO for its acceleration effort to meet the PCD (finding 20). We have rejected AEPCO's methodology for pricing acceleration because it assumed that the Navy was solely responsible for all of the acceleration cost, and because it did not distinguish between the causes for which the Navy was responsible and those for which the Navy was not (finding 394). Based on the evidence in the record, we have found that a fair approximation of AEPCO's acceleration cost can be determined by calculating the additional cost of using AEPCO's then existing main feed pump work force, working 10 hours each weekday, and 20 hours during each of the 9 weekends, between 12 January and 13 March 2000. Because the need to hire temporary labor did not stem from the imposition of the PCD, we have found that temporary OT labor should not be a part of the equitable adjustment for acceleration. (Finding 395) We remand to the parties for final calculation of the quantum of adjustment for acceleration. The parties are to use the rates we found applicable in pricing unresolved formal sequences.

Quantum – Scoping and Pricing

AEPCO's claim sought $207,017 as the cost of preparing a Request for Equitable Adjustment (REA) for submission to the CO (R4, tab 501-G at GOV012546-48). The Board's summary judgment decision of 21 January 2003 decided entitlement in AEPCO's favor on this issue. *See AEPCO*, 03-1 BCA at 158,995. The Navy appealed our decision to the United States District Court for the Eastern District of Virginia. In a decision issued on 17 November 2003, the court affirmed the Board's decision. *Johnson v. Advanced Engineering & Planning Corp.*, 292 F. Supp. 2d 846 (E.D. Va. 2003). Counsel for the parties advised the Board that the parties have settled the claim by way of bilateral Modification 1L.[54]

[54] Navy counsel's letter of 11 August 2004 forwarded bilateral Modification 1L.

Time Value Of Additional Working Capital

AEPCO claims $128,779 as the time value of additional working capital used to finance the various changed work. In *Chem-Care Company, Inc.*, ASBCA No. 53614, 04-1 BCA ¶ 32,593, we said at 161,254:

> The costs claimed by appellant for lost financing costs are simply interest on borrowings by different names. Where, as here, FAR Part 31 applies to a contract, interest on borrowings is simply not recoverable.

Because AEPCO's claim amounted to unallowable financing costs, it is therefore denied.

Interest On The Claim

Contract Disputes Act interest (41 U.S.C. § 611) on the amount found due shall run from 21 June 2001, when the CO should have received AEPCO's 18 June 2001 certified claim (*see AEPCO*, 03-1 BCA at 158,990, ¶ 55).

CONCLUSION

These appeals are sustained to the extent indicated, and are in all other respects denied.

Dated: 19 November 2004

PETER D. TING
Administrative Judge
Armed Services Board
of Contract Appeals

I concur

MARK N. STEMPLER
Administrative Judge
Acting Chairman
Armed Services Board
of Contract Appeals

I concur

EUNICE W. THOMAS
Administrative Judge
Vice Chairman
Armed Services Board
of Contract Appeals

I certify that the foregoing is a true copy of the Opinion and Decision of the Armed Services Board of Contract Appeals in ASBCA Nos. 53366, 54044, Appeals of Advanced Engineering & Planning Corporation, Inc., rendered in conformance with the Board's Charter.

Dated:

CATHERINE A. STANTON
Recorder, Armed Services
Board of Contract Appeals