ARMED SERVICES BOARD OF CONTRACT APPEALS

Appeal of --	)	
	)	
Grumman Aerospace Corporation	)	ASBCA No. 48006
	)	
Under Contract No. F04606-86-C-0122	)	

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OPINION BY ADMINISTRATIVE JUDGE DELMAN

This is the third opinion we have issued on the merits under this contract. In *Grumman Aerospace Corp*., ASBCA Nos. 46834, *et al.*, 03-1 BCA ¶ 32,203, *aff'd on recon.,* 03-2 BCA ¶ 32,289 ("*Grumman I*"), we denied ASBCA No. 51526 and sustained ASBCA No. 48006 in part, finding entitlement on a number of appellant's claims.[1] In *Grumman Aerospace Corp*., ASBCA No. 46834, 05-2 BCA ¶ 33,084, *recon. pending* ("*Grumman II*"), we sustained the appeal and denied the Air Force (AF) claim. This opinion involves appellant's quantum claim under ASBCA No. 48006. Our opinion in *Grumman I* was lengthy, containing 491 findings of fact and extended legal discussion. Familiarity with that decision is presumed. We shall restate only those findings and conclusions from the entitlement decision that are necessary for the proper disposition of appellant's quantum claim.

[1] Administrative Judge Ronald Jay Lipman, who participated in the decision in *Grumman I*, is deceased.

FINDINGS OF FACT

I. The Ernst & Young Damages Calculation

1. GAC retained Ernst & Young LLP (E&Y) to calculate appellant's damages under this contract in response to the Board's Order on Proof of Damages and Costs. The E&Y team was headed by Dr. Louis Rosen, National Director of the Ernst & Young Government Contract Services group.

2. E&Y used the modified total cost method (MTCM) to quantify appellant's damages. Insofar as pertinent, E&Y explained the rationale for proceeding in this fashion as follows:

> The quantification of the claimed damages is computed by means of the modified total cost method. This approach is used because the cost impacts (damages) of the Government's actions can not be identified and quantified in relation to each specific action or entitlement. Instead, the quantification of damages is computed based on the variances of actual cost from contract target cost. The appellant recognizes that not all unfavorable cost variances experienced in the performance of Contract No. F04606-86-C-0122 were the result of Government actions. The modified total cost quantification approach used differentiates the additional costs resulting from Government actions from other additional costs (in excess of the contract target cost) which were not caused by Government actions.
>
> . . . Damages are quantified for each element of Level 3 of the Contract Work Breakdown Structure (WBS) impacted by Government actions.

(GAC R4, tab 3489 at 1)

3. The GAC contract work breakdown structure (WBS) was divided into a number of "levels", corresponding to the level of detail of the given work activity – from the most general, *i.e.*, Level 1, to the most specific, *i.e.*, Level 8. E&Y used Level 3 of the WBS to quantify appellant's cost variances. Level 3 was the level at which the contract work was defined, the contract budget baseline was summarized and documented and at which incurred costs were compared with the budget baseline and reported to the government. (Ex. A-32A at 7) The contract target cost baseline budget and the actual costs incurred summarized to Level 3 were the basis for GAC's monthly

cost performance reports (CPRs) to the AF (ex. A-32A at 7; tr. 43/55). E&Y was able to reconcile and verify appellant's budget data and incurred cost data at Level 3. (Tr. 43/39-40)

4. Level 6 data reflected work activities that were broken down at a more specific level in terms of work scope and organization than that of Level 3. For example, one Level 3 work element could contain a number of subsidiary Level 6 cost accounts. WBS Level 6 was the primary cost account level and was used for appellant's planning, budgeting, control and reporting. GAC's cost account managers generally planned their budgets and managed their work tasks at Level 6. E&Y would have considered GAC's Level 6 budget data if it had been available when it prepared the quantum calculation, but the data were not available at the time. (Tr. 41/157, 229, tr. 42/37, 288-89, 304-05)

5. E&Y based its claim quantification upon cost variances that were measured by the difference between appellant's incurred costs and the budgeted portion of the final contract target cost for each Level 3 WBS element determined to have been significantly impacted by the AF (ex. A-32A at 6-7). Overall, there were 53 WBS Level 3 elements for this contract. (Ex. A-32A at 20; tr. 41/153) E&Y excluded 19 of the 53 WBS Level 3 elements from its damages calculation because they were not adversely affected by AF action. (Ex. A-32A at 15, 26-27) E&Y excluded another four WBS Level 3 elements because GAC actions were the principal cause of these variances. (Ex. A-32A at 27) For two WBS Level 3 elements – F-111A/E WBS 3-1100 (Aircraft Hardware Design) and F-111A/E WBS 3-4400 (Test Equipment) – E&Y allocated the cost variances between GAC and the AF. (Ex. A-32A at 27-28) In sum, the E&Y damages calculation charged the AF for all cost variances in 30 of the 53 WBS Level 3 elements under the contract. (Ex. A-32A at 26-28)

6. In order to validate the accuracy of the WBS Level 3 cost data, E&Y performed an incurred cost reconciliation with GAC's existing trial balance of contract costs ("TBCC"). The TBCC contained all of GAC's direct and indirect incurred costs, and was part of GAC's accounting system. The E&Y incurred cost reconciliation with the TBCC resulted in a variance of $3/1000^{th}$ of one percent, and was summarized in its damages calculation. (Ex. A-32A at 21-23; GAC R4, tab 3489 at 198-200, *see* note 8)

7. E&Y used the budget/contract target cost numbers from appellant's June, 1991 CPR to establish the budget baseline against which to contrast appellant's incurred costs (ex. A-32A at 24; tr. 42/41, 174, 181-82). The data used to develop the baseline were obtained directly from records prepared and maintained as part of GAC's performance measurement system ("PMS") and appellant's CPRs. (Ex. A-32A at 23) Grumman's PMS was used to plan, budget, authorize and measure work progress (ex. A-32A at 23). E&Y used the contract target cost figures from the June, 1991 CPR because: (1) it contained contemporaneous WBS Level 3 data; (2) E&Y could reconcile the data;

(3) contract modifications, in the amount of approximately $20 million, were already included in the budget/contract target costs; (4) the contract as awarded was incrementally funded and there was a substantial difference between the 1985 BAFO and appellant's initial 1986 budget; and (5) the last required monthly CPR was for June, 1991 and the data could be reconciled to appellant's program work authorization ("PWA") logs. (Tr. 43/46-49, 139, 154-55, tr. 42/174-75, 259; ex. A-32A at 8-9)

8. E&Y made six monetary adjustments to the June, 1991 budget baseline, the net effect of which was to increase the budget baseline (ex. A-33 at 41-44, ex. A-32A at 25-26). In one of these adjustments, E&Y accounted for 26,843 hours of RC-11 flight test labor inadvertently omitted from appellant's BAFO, by distributing the hours between the F-111A/E and EF-111A in the same ratio as the existing budgets in the applicable WBS Level 3 element, WBS 3-4300 Flight Test (ex. A-32A at 25-6).

9. Based upon the MTCM quantification, E&Y determined that GAC was entitled to $50,392,525, plus CDA interest (GAC R4, tab 3489 at 6). Appellant's 30 March 1994 claim had sought $65,612,862, plus interest (R4, tab 991 at 126).

II. The Necessary Elements for a Modified Total Cost Calculation

The Impracticability of Segregating and Identifying Reasonably Accurate Cost Data For GAC's Claims

10. GAC had an accounting and cost-tracking system that was technically capable of tracking out-of-scope work activities (ex. G-108 at 8, 13; tr. 42/283-84, tr. 57/145). In a few instances GAC sought to track certain claimed out-of-scope costs through use of secondary job numbers. (*See e.g.*, AF R4 supp. 2nd, tab 1361.574, tab 1361.693, tab 1788.072, tab 1922.014 at 3872, tab 1963.047a)

11. However, many of appellant's claims impacted identical WBS elements in the same contract performance period. Specifically, nine of appellant's claimed entitlements impacted WBS 3-1600, Software, for the F-111A/E during the first quarter of 1987. Given such concurrency, it was difficult to accurately track which costs were attributable to which claims. (Tr. 43/42-43) WBS elements were impacted by multiple entitlements and the impacts were interactive and/or concurrent (ex. A-32A at 13).

12. In addition, a number of appellant's claims, *i.e.*, reliance on FB-data to develop MC OFP, backup functions and memory reserve, had an impact on appellant's software development effort from the beginning of contract performance (*Grumman I*, 03-1 BCA at 159,183, 159,198). As such, it was difficult to determine with reasonable accuracy when the out-of-scope work began as compared to the in scope work. As stated by appellant's expert:

> You have to understand that in a large project of this kind you may, at any given time, either be able to determine you're in scope or out of scope at a given moment. And you may be one or the other. You may think you're in and you're out, and later determine that.
>
> So you may not at every instance -- frequently, you're not able to determine from when it starts. It's only after realizing that the data was defective that we're out of scope. But what about all of that work up to that time that was "not really contributing to achieving the goal because of defective data"? I didn't know when I did it.
>
> Now, I can't set this up because I didn't know. And you have to have both the ability to set it up and the knowledge of what is happening to be able to execute this.

(Tr. 42/283)

13. Based upon the above, we find that it was not practicable to segregate and identify reasonably accurate cost data for all of GAC's claims under the circumstances of this case.

The Reasonableness of GAC's BAFO Price, As Modified

14. E&Y did not perform an independent evaluation of the reasonableness of GAC's proposed costs. E&Y relied solely upon the Source Selection Advisory Council Analysis Report (SSAC Report) that stated that appellant's proposal was complete, reasonable and realistic. (Ex. A-33 at 50-51) In full context the SSAC Report stated as follows:

> **There is a significant difference between the engineering hours proposed by Grumman and those estimated by the Government.** This is due in part to Grumman's practice of using a high ratio of indirect to direct personnel. The Grumman estimating system classifies many engineering support tasks as indirect while the Government estimators **may have** considered them to be direct costs. Since the NAVPRO recommended rates for Grumman were applied to the Government estimated hours, some engineering support costs **may** be double charged in the Government

> estimate. **Based on this potential anomoly [sic]**, the Grumman proposal is within acceptable parameters of the Government "should cost" and is considered to be complete, reasonable and realistic.

(Emphasis added) (GAC R4, tab 3140 at 0006982) The government "should cost" target cost was $117,582,657. GAC's proposed target cost was roughly $15 million lower, at $102,627,787. (*Id*. at 0006984)

15. The Source Selection Evaluation Board (SSEB) Report showed major discrepancies in proposed direct engineering hours between the two bidders and the government estimate: GAC bid 689,916 hours, General Dynamics Corp. (GDC) bid 1,848,605 hours, and the government estimate was 1,077,000 hours. While a government field price report did not take exception to GAC's proposed direct engineering hours, the AF raised the issue of the reasonableness of these proposed hours during pre-award discussions. (GAC R4, tab 3107 at 7026, 7030, 7035) Appellant replied that its figures were correct, and the AF ultimately awarded the contract to GAC. With respect to appellant's direct engineering hours, the SSEB Report stated:

> [I]t is the evaluator's opinion that **the proposed hours are somewhat less than that required to accomplish this task** but are within reasonable parameters of the Government estimate, all things considered.

(Emphasis added) (*Id.* at 7027)

16. Appellant's March, 1994 claim alleged, *inter alia*, that the AF failed to explain to GAC that its bid was "grossly lower than the Air Force's estimate as to indicate the possibility of errors" (R4, tab 991 at 52-53). Appellant claimed it made a unilateral bid mistake. The Board dismissed this claim, holding that appellant failed to provide evidence of a specific mistake and its intended bid. *Grumman Aerospace Corp*., ASBCA No. 48006, 95-2 BCA ¶ 27,891.

17. During contract performance, appellant questioned the reasonableness of its software bid, which included its proposed direct software design engineering hours. In September, 1987, appellant provided the AF with an F/EF-111A/E AMP Program Financial Review that contained a "Summary" page stating as follows:

SUMMARY

- CREDITABLE ESTIMATE AT COMPLETION
  REASONABLE ALLOWANCES FOR
  ADDITIONAL MANHOURS

- MET SCHEDULED MILESTONES

- **RECOGNIZE PROBLEM AREAS**
  BID SOFTWARE TOO TIGHT

- PROCEEDING WITH AIR FORCE DIRECTIONS

WILL HONOR OUR COMMITMENTS

(Emphasis added) (AF R4 supp., tab 2672 at 1304)

18. By letter dated 17 August 1988, appellant's president replied to an AF cure notice, stating as follows:

> Grumman is very aware of its obligations under the contract and wishes to assure the Air Force that a maximum effort has been generated to correct the mission computer software problems and to minimize further delivery schedule deterioration. **In retrospect, it is evident that Grumman did not fully recognize the time required to accomplish the original software task**. This condition was further exacerbated by our over reliance on available software from the FB-111 Program and the growth rate of additional software tasks; both in and out-of-scope. Further, an additional contributory factor was that, **in the interest of expediency, Grumman violated its own software procedures**. Consequently, Enclosure (1) is based on a strict adherence to good software practice and procedures.

(Emphasis added) (R4, tab 339)

19. The record also indicates that appellant failed to consider systems variations within and between aircraft types until after award (tr. 25/99-100), and that certain maintenance trainer set (MTS) work tasks were not considered in the MTS estimate

(AF R4, supp. 2nd, tab 1963.042(b)). It is also undisputed that appellant inadvertently omitted 26,843 hours of RC-11 flight-test labor from its BAFO (ex. A-33 at 43). The E&Y damage calculation adjusted for this latter error, but it did not account for the other bid discrepancies referenced above.

20. Based upon the weight of the evidence, we find that appellant's proposed BAFO costs as modified by E&Y were not shown to be reasonable.

The Reasonableness of GAC's Incurred Costs

21. E&Y did not perform an audit or any independent evaluation of appellant's actual costs. It determined that appellant's actual costs were reasonable by comparing them favorably to the proposed costs of GDC, the only other bidder, and the pre-award AF independent cost estimate (ICE). GDC's proposed target cost was $179.3 million. The AF ICE was $179.4 million. GAC's total incurred cost was $173.2 million, excluding the costs of firm fixed priced modifications in the amount of $4,204,476. (Ex. A-33 at 13, 51)

22. The SSEB, however, determined that GDC's proposed contract target price was unreasonable. Insofar as pertinent, the SSEB Report concluded, and we find as follows regarding the GDC proposal:

> **The manufacturing hours proposed for the EF-111A kits does [sic] not appear reasonable** based on the similarity to the F-111A/E kits, the fact that the wiring in the EF-111A is much more current, and the fact that the offeror should be experiencing a learning curve. Since the EF-111A hours do not compare favorably with the F-111E hours for manufacturing, these hours are considered unreasonable.
>
> The proposed engineering hours for the F-111A/E and EF-111A effort are approximately 900 man years. The hours proposed for the FB-111A effort were 829 man years. Since the strength of the General Dynamics' technical proposal was the commonality with the FB-111A and the pool of AMP experienced people from whom the offeror could draw, we find no explanation for this anomoly [sic]. **Based on this and the government's estimate the proposed engineering hours appear to be unreasonable.**
>
> Although the various rates, factors and ODCs differ between the proposed values and the AFPRO recommended

> Government values, these are still considered to be reasonable. **However, when reasonable rates are applied to an unreasonable base, the result is also unreasonable.**
>
> **Based on this, the proposed [General Dynamics] price, though realistic is also considered unreasonably high in this situation.**

(Emphasis added) (GAC R4, tab 3107 at 7034) The SSAC Report also concluded: "The General Dynamics cost proposal is, in our judgment, overstated" (GAC R4, tab 3140 at 0006983).

23. As for the government ICE, we find that this estimate was so close in amount to the GDC proposal for the reasons stated in the SSAC Report:

> The ICE used the information available from the FB-111A AMP integration contract, which was awarded sole source to General Dynamics by ASD, as a primary source of cost data and information. This data naturally incorporated the General Dynamics' philosophy and approach to an integration effort of this type.

(GAC R4, tab 3140 at 0006982) The SSEB Report also stated in this regard, and we find as follows:

> The cost estimate was developed using the only known data source, General Dynamics. The cost estimate is not applicable in determining the reasonableness of Grummans's cost estimate. A cost estimate is most beneficial for sole source contracts or contracts with previous history. A cost study isn't suitable to assess cost reasonableness on this particular contract.

(GAC R4, tab 3107 at 7021)

24. Based upon the weight of the evidence, we find that appellant's actual costs were not shown to be reasonable.

The Responsibility for GAC's Claimed Incurred Costs

25. GAC's total incurred costs for the contract include the cost impacts of all claims that are the basis of the E&Y quantum calculation. However in *Grumman I*, we

concluded that appellant – not the AF – was responsible for the costs incurred under a number of these claims. Specifically, the Board denied the following GAC claims: Claims (1); (2) in part; (4); (5); (6) in part; (8) in part; (9); (10); (13); (14); (17); (18); (19); (20); (21); (22); (23); (26) in part; (27) in part; and (28) in part. E&Y excluded a number of WBS level activities from its damages calculation based upon its view that the AF was not responsible for them (finding 5, *supra*), but E&Y did not account for the significant costs incurred by appellant under the above claims for which the appellant was responsible.

26. In addition, E&Y determined that the AF was responsible for all cost variances for WBS Level 3 activities related to software engineering and design, such as RC-10 design engineering labor in WBS 3-1600 Software (tr. 42/120). However, in *Grumman I*, we concluded that GAC was responsible for much of this cost:

> The record shows that appellant made memory-consuming code changes to address many STRs and FPRs that were its own responsibility. Appellant's software developers were shown to be inexperienced and lacking in basic knowledge of aircraft systems, their work was hurried and without adequate review, and they violated their own internal procedures for software development and design. These problems also contributed to inefficient design and memory reserve problems that were appellant's responsibility.

(03-1 BCA at 159,204) E&Y did not account for appellant's responsibility for these costs (tr. 42/120).

III. GAC's Posthearing Quantification of Damages To Segregate AF Liability

27. Given the Board's conclusions in *Grumman I* that not all contract costs were the responsibility of the AF, appellant's subsequently filed quantum brief provided a number of alternative ways to segregate the costs for which the AF was responsible. We summarize these methodologies below.

Quantification No. 1

28. With respect to each relevant WBS Level 3 work element, GAC divided the claimed entitlements affecting that element into two groups – those that GAC won and those it lost, per *Grumman I*. Next, GAC placed each of the claims into one of three categories: "large," "medium," or "small," based upon the magnitude of its claimed impact on that WBS Level 3 element. Appellant then developed an estimated percentage figure to reflect the magnitude of that impact, and applied that rate to the total cost

variance per WBS Level 3 element, as calculated by E&Y, in order to estimate AF responsibility. (App. amended quantum br. at 51-72)

29. In summary, appellant's quantification of AF liability for the F-111A/E was as follows:

WBS Element	Impacts, Per Each Sustained Claim	AF Responsibility
3-1100 Hardware Design	Small	10% of Total Variance = $89,149
3-1200 Navigation/Guidance	Large, Medium, Small	50% of Total Variance = $410,432
3-1300 Controls and Displays	Medium, Small	15 % of Total Variance = $50,350
3-1400 Fire Controls	Small	5% of Total Variance = $11,803
3-1500 Auxiliary Equipment	None	0
3-1600 Software	Large, Medium, Small	55% of Total Variance = $1,084,680
3-1700 Avionics Design and Integration	Medium, Small	35% of Total Variance = $155,296
3-2100 Maintenance Training Equipment	Large, Medium, Small	50% of Total Variance = $818,470
3-2200 Training Services	Small	5% of Total Variance = $2,816
3-3100 Organization, *et seq.*	Large, Small	50% of Total Variance = $167,653
3-4100 Lab Integration Testing	Large, Medium, Small	55% of Total Variance = ($48,976)
3-4200 Ground Test	Large, Medium, Small	65% of Total Variance = $146,194
3-4300 Flight Test	Large, Medium, Small	55% of Total Variance = $4,871,159
3-4400 Test Equipment	Large, Medium, Small	60% of Total Variance = $913,829
3-6100 Engineering Data	Large, Medium, Small	45% of Total Variance = $107,670
3-6200 Technical Publications	Large, Medium, Small	40% of Total Variance = $715,317
3-7100 Trial Aircraft	Small	10% of Total Variance = $274,994
3-5100 Systems Engineering and Management	Impacts not labeled. GAC used percentage of AF responsibility for all F-111A/E variances	44.3% of Total Variance = $464,852
3-5200 Project Management	(as above)	44.3% of Total Variance = $4,486,921

(App. amended quantum br. at 72-73)

30. Appellant used this same quantification method for the cost variances for the EF-111A. It then added 15% profit to the F-111A/E and EF-111A subtotals. Based upon this quantification method, appellant contends that the AF is liable to GAC in the amount of $22,789,399, plus interest. (App. amended quantum br. at 74-75)

Quantification No. 2

31. Under this quantification method, appellant's brief used the same grouping methodology as in Quantification No. 1. Appellant then assigned relative weights to the "large," "medium," and "small" impacts: a "large impact" was determined to equal "3 medium impacts", and a "medium impact" was determined to equal "4 small impacts". The brief then assigned a weight of "12 points" to a large impact, "4 points" to a medium impact and "1 point" to a small impact. Where the Board in *Grumman I* sustained an entitlement in part, the "weight" (*i.e.*, the point value) was shared on a 50-50 basis. (*Id.* at 75)

32. Under Quantification No. 2, appellant's brief calculated the claimed costs for which the AF was responsible by calculating the relationship between the number of "points" for its sustained claims as compared to the total number of points for all claims both won and lost, per *Grumman I,* for the affected WBS Level 3 work element, and applying that rate as a percentage against the total cost variance of each WBS Level 3 element. (App. amended quantum br. at 75-97)

33. In summary, appellant's quantification of AF liability for the F-111A/E was as follows:

WBS Element	Sustained Claims Points/ Total Points	AF Responsibility
3-1100 Hardware Design	1.5 of 17	8.8% of Total Variance = $78,451
3-1200 Navigation/Guidance	19 of 38	50% of Total Variance = $410,432
3-1300 Controls and Displays	3 of 18	16.6 % of Total Variance = $55,720
3-1400 Fire Controls	1 of 18	5.5% of Total Variance = $12,984
3-1500 Auxiliary Equipment	0	0
3-1600 Software	33 of 59	55.9% of Total Variance = $1,102,430
3-1700 Avionics Design and Integration	8.5 of 25	34% of Total Variance = $150,859
3-2100 Maintenance Training Equipment	17 of 35	48.5% of Total Variance = $793,916
3-2200 Training Services	.5 of 13	3.8% of Total Variance = $2,140
3-3100 Organization, *et seq.*	6.5 of 13	50% of Total Variance = $167,653
3-4100 Lab Integration Testing	32 of 58	55% of Total Variance = ($49,065)
3-4200 Ground Test	29 of 43	67.4% of Total Variance = $151,592
3-4300 Flight Test	41.5 of 73	56.8% of Total Variance = $5,030,578
3-4400 Test Equipment	17 of 28	60.7% of Total Variance = $924,490
3-6100 Engineering Data	33.5 of 72	46.5% of Total Variance = $111,259
3-6200 Technical Publications	20.5 of 49	41.8% of Total Variance = $747,506
3-7100 Trial Aircraft	1.5 of 16	9.3% of Total Variance = $255,744
3-5100 Systems Engineering and Management	No points. GAC used percentage of AF responsibility for all F-111A/E variances.	45.13% of Total Variance = $473,246
3-5200 Project Management	(as above)	45.13% of Total Variance = $4,567,949

(*Id.* at 97-98)

34. This same type of quantification was performed for the cost variances for the EF-111A. Appellant added 15% profit to the F-111A/E and EF-111A subtotals. Under Quantification No. 2, appellant contends that the AF is liable in the amount of $22,901,693, plus interest. (*Id.* at 100)

Quantification No. 3

35. Under this quantification, GAC's brief used the same methodology as Quantification No. 1, except that the claimed TRW settlement costs were excluded from the WBS Level 3 element analysis and were priced separately. Based upon this approach, appellant claimed $25,658,018, plus interest (*id.* at 125).

Quantification No. 4

36. Under this quantification, appellant's brief used the same methodology as Quantification No. 2, except that the claimed TRW settlement costs were excluded and priced separately. Based upon this approach, appellant claimed $25,895,105, plus interest (*id*. at 151).

37. We find that none of the above quantifications was adopted by any witness at trial. In a record consisting of 77 days of testimony and thousands of documents and exhibits, appellant offered no testimony and offered no documentary evidence related to the use of any of these quantifications, or any of the estimates or percent figures upon which the quantifications were based.

IV. GAC's Improper Reliance on REA Quantum

38. In June, 1991, GAC filed an omnibus request for equitable adjustment (REA) with the contracting officer (CO) (R4, tab 936). The AF conducted factfinding, and thereafter GAC submitted a revised REA in May, 1993 (R4, tab 979). The AF denied the REA for the most part, and GAC filed a claim in March, 1994 (R4, tab 991). The CO denied the claim and GAC appealed to this Board. Appellant's claim was based upon a total cost theory. Appellant's REA was based, in large measure, upon estimates. At trial, GAC made it clear on a number of occasions that it was not relying on the quantum estimates from its REA to support its claim, but rather on the MTCM quantification prepared by E&Y. In response to an AF motion to strike and motion in limine (REA Quantum Evidence) filed during the third phase of the trial, appellant represented to the Board in open court as follows:

> **I will state on the record so that there's no doubt about it that, one, we are not relying in any way, shape or form on any quantum or quantification of Grumman's damages as set forth in the REA** . . . . [W]e are not, as I said, relying on it in any way, shape or form, and we will not be introducing any evidence of it in any way, shape or form.
>
> So I think that takes care of [Respondent's] motion.

. . . .

> **I think I've made it as clear as I can - - we're not relying on any REA quantum** and whether the testimony was elicited by the Government or by the contractor on quantum, as opposed to entitlement, **it should be stricken and not considered by the Board**.

(Emphasis added) (Tr. 40/116-17, 119)

39. By letter to the Board dated 8 February 1999, appellant reiterated its position as follows:

> **Consistent with the representations on the record by Grumman's counsel** . . .(i) **Grumman** has not proffered, will not introduce and **does not rely upon any "REA quantum evidence" to quantify its damages in this case; and (ii) Grumman agrees with the Air Force that any such "REA quantum evidence" in the record now or in the future should properly be stricken therefrom**.

(Emphasis added) (Bd. corr. file) Based upon appellant's representations, the Board ruled in pertinent part as follows:

> The Government's motion to preclude the Appellant from introducing quantum evidence related to the REA is granted based upon Appellant's consent as set forth in Appellant's letter dated 8 February 1999.
>
> The Government's motion to strike evidence is denied because the Government has failed to show the Board through any citations to the record any particular evidence it seeks to strike.

(Tr. 45/10)

40. A number of months later, in a response to an AF motion to strike certain evidence on the grounds that GAC was impermissibly providing REA quantum evidence in support of its claim, appellant reiterated its position as follows:

> **Consistent with its prior representations to the Board**, Grumman's position with respect to REA quantum evidence is that: (i) **Grumman** has not proffered, will not introduce and **does not rely upon any "REA quantum evidence" to quantify its damages in this case; and (ii) Grumman agrees with the Air Force that any such "REA quantum evidence" in the record now or in the future should properly be stricken therefrom**.

(Emphasis added) (Bd. corr. file, memo dated 7 May 1999 at 7, note 6) The Board denied the AF motion in light of GAC's representations above, and given appellant's oft-repeated assertions that its claim was predicated upon the E&Y damage calculation and not upon any REA quantum figures.

41. Based upon GAC's unequivocal representations, the AF did not examine appellant's witnesses on REA quantum at trial and did not present any rebuttal evidence related to appellant's REA quantum figures.

42. A review of appellant's amended quantum brief makes it abundantly clear that appellant now refers to, and relies upon REA quantum evidence in numerous contexts -- specifically referencing various manhour estimates in the record – to explain and to support its claim for damages. *See, e.g*., GAC STS data; cockpit video for EF-111A; terrain-following-radar (TFR) for EF-111A; single point failure; flight test variance; program management variance (app. amended quantum br. at 154, 158, 159, 160, 168-171). The AF has moved to strike, *inter alia*, this REA quantum matter from appellant's amended quantum brief.

43. We find appellant's action is clearly inconsistent with its repeated representations to this Board in open court and in writing, and works a material prejudice to the AF. Accordingly, we grant the government's motion to strike all references to REA quantum in appellant's amended quantum brief in accordance with appellant's repeated representations to this Board that this evidence should not be considered by the Board to support its claim, and we shall ignore this REA quantum evidence, except as otherwise provided herein.[2]

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[2] We strike only that quantum data that was specifically prepared for the REA of June, 1991, as modified in May, 1993. We shall not ignore project records and related data that may have been used in the REA, but had an existence independent of the REA and may have been requested, prepared, or used for earlier GAC proposals. Specifically, the quantum evidence we ignore consists of quantum material requested and/or generated starting roughly in the middle of 1989, since this is the general time frame in which appellant's counsel began exploring the preparation

V. Burdened Labor Rates for Individual Labor Resource Codes

44. In its amended quantum brief, GAC calculated burdened labor rates for each of the manufacturing and engineering labor codes for 1988, which it claimed was the midpoint of performance under the contract (app. amended quantum br. at 152). GAC made these calculations based upon the evidence of record, *i.e.*, the actual cost data contained in E&Y's quantification of damages.[3]

45. The claimed engineering labor code burdened rates (RC-10, RC-11, RC-13, RC-14, RC-15) varied from $45.37 per hour to $59.84 per hour. The claimed manufacturing labor code burdened rates (RC-20, RC-21, RC-23, RC-30, RC-40, RC-74) varied from $42.50 per hour to $60.12 per hour. (App. amended quantum br. at 152-53) It does not appear that the AF audited these individual rates. It is also self-evident that labor rates in earlier and later years of contract performance could differ from these 1988 rates.

46. We find the evidence is sufficient to derive a fair and reasonable burdened labor rate. We find that $50.00 per hour is a fair and reasonable burdened labor rate for the relevant labor codes during contract performance, and we shall use this figure for purposes of pricing any equitable adjustment to which appellant may be entitled.

VI. The CO's Review of the REA

47. The CO's reply to GAC's REA acknowledged some limited entitlement and quantum on a number of claims: the cockpit video system for the F-111A/E and EF-111A and the terrain–following radar (TFR) for the EF-111A ($344,729 lump sum); certain CSRT out-of-scope directions ($69,113); out-of-scope STRs ($40,949); out-of-scope ballistics data ($20,539), and normal accelerometer ($24,960) (R4, tab 985). Neither this CO letter nor any other evidence of record provided the source data upon which the CO relied to support these quantum determinations. GAC refused to accept

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of the REA (ex. G-239(a)). The AF argues that project records dated as early as 1988 were stamped "PRIV" or "confidential and privileged, attorney-client communication," and hence they also must be considered part of the REA-preparation process. We do not agree. For the most part, the stamping of these project records as privileged was indiscriminate and without legal basis. We will not strike or ignore these project records simply because they were stamped in this manner.

[3] We deny the AF's motion to strike the portion of the brief that contained these labor rates. We believe that these rates were derived from evidence of record and may be properly presented in a posthearing brief.

these amounts to settle the REA, and filed a claim in March, 1994. For the most part, GAC reiterated its contentions in its claim, but sought recovery on a total cost and/or jury verdict basis rather than upon the manhour estimates in the REA. The CO's decision of September, 1994 acknowledged entitlement on the aforementioned claims, but did not acknowledge any monetary liability because it questioned the applicability of appellant's quantum approach. (R4, tab 999)

VII. The TRW Subcontract and GAC's Settlement of TRW's Claims

48. In 1985, TRW submitted proposals to GAC with respect to providing certain software-related services under the projected AMP contract. After the AF awarded the contract to appellant in January, 1986, GAC issued a purchase order to TRW in February, 1986 to initiate preliminary activities (tr. 16/73). The subcontract for the F-111A/E work – Purchase Order No. 18-53520 – was issued to TRW on 3 May 1986 (AF R4 supp. 2nd, tab 1498.395). It appears that related work for the EF-111A was added later to the purchase order, and the costs and prices were not finally negotiated until 1988 (*id.*).

49. Under the subcontract, as modified, TRW was generally responsible for the following work: (1) the design, development and delivery of a software design aid (SDA) for the F-111A/E, and the modification of the F-111A/E SDA for use on the EF-111A; (2) the modification of the software for the FB-111A programmable display generator software test station (PDG STS) to enable the PDG STS to support FB-111A, F-111A/E and EF-111A requirements; (3) the modification of the software for the FB-111A mission computer software test station (MC STS) to enable the MC STS to support FB-111A, F-111A/E and EF-111A requirements; (4) the modification of the software for the FB-111A system function processor operational flight program (SFP OFP) software to enable the SFP OFP to support F-111A/E and EF-111A requirements. (Ex. A-3 at 1-1)

50. In *Grumman I*, we found that the FB-111A test stations and related data were government furnished property (GFP) under the Government Property clause and were required to be delivered by the AF suitable for their intended use, that is, reasonably accurate, complete and timely so as to enable GAC and TRW to perform their work consistent with contract requirements. We concluded that the AF failed to deliver reasonably complete and accurate FB STS B-5 and C-5 specifications in a timely manner so as to allow for the orderly prosecution of the contract work. (03-1 BCA at 159,192-193)

51. By letter to the CO dated 15 October 1986, appellant addressed the late receipt of FB-111A STS documentation. GAC advised that the work was proceeding with the preliminary information provided, but this was causing "work arounds" and cost and potential schedule impact, the extent of which could not be presently determined.

(GAC R4, tab 969 at 0023206) TRW also did not receive accurate or complete acceptance test procedures for the FB-111A STS (tr. 15/186-87). The FB-111A STS documentation did not adequately describe the STS software nor did it correlate with the FB-111A STS software. (Tr. 18/10-12) During the integration phase of the AMP program in 1987, TRW was still discovering errors in the FB-111A STS data. (Tr. 17/304-06)

52. TRW had to devise alternatives and workarounds to compensate for not having accurate and complete FB-111A STS data. These workarounds were labor intensive. (Tr. 18/55-57) Moreover, the lack of complete, accurate FB-111A STS data caused TRW to reverse engineer some of the FB-111A STS data. Since TRW did not receive a complete FB-111A STS C-5, TRW had to reverse engineer the FB-111A STS C-5 from the FB-111A STS source code, and reverse engineer the FB-111A STS B-5 from the FB-111A STS C-5. This was a time consuming effort. (Tr. 17/274-75, 295-98, 302-03)

53. However, the record also reflects that TRW failed to timely receive material data from GAC for which GAC was solely responsible. GAC failed to timely provide the GAC-generated OFP data needed for modeling purposes (tr. 18/152-53). TRW was required to make an expanded MC OFP model because GAC failed to timely develop its GNC and WDC OFP (tr. 19/89). TRW had to work software trouble reports caused by appellant's OFP (tr. 18/279). GAC also failed to timely provide F-111A/E flight manuals, causing delay to the B-5 (tr. 16/79-81, 109).

54. During integration of the MC model on the PDG-STS, TRW also discovered errors between its SFP OFP and appellant's MC OFP and discovered missing requirements from appellant's OFP (ex. A-3 at 1-16). TRW depended upon the accuracy of appellant's work (tr. 16/125). As a result of inaccuracies in appellant's work, TRW had to write additional code, and had to make changes to its specifications (ex. A-3 at 1-16). The record also shows that GAC failed to timely perform its hardware modifications on the MC STS, which contributed to inefficient labor sharing arrangements on the STS between TRW and GAC personnel (tr. 19/71, 85-86).

55. On or about 26 August 1988, TRW filed with GAC a proposal for equitable adjustment in the amount of $3,943,030 (ex. A-3 at 1-21; *see* "cc" list of GAC project personnel recipients at front page). TRW's claim included claims for late and deficient performance for which GAC and the AF were separately and independently responsible. The impact and costs caused by each party were not segregated. (Tr. 17/39-40) AF-related problems and GAC-related problems both affected TRW's work and impacted its costs (tr. 18/157).

56. By letter dated 13 December 1990, TRW filed a follow-on claim with GAC, seeking $2,037,134 for, *inter alia*, continued out-of-scope costs in 1989 and 1990 for engineering, testing and technical documentation efforts, MC OFP delays, and additional project management. We find that this claim also identified delays for which appellant and the AF were independently responsible. (GAC R4, tab 3538)

57. GAC settled TRW's 1988 claim for $3,400,000, and paid this amount under Amendment No. 29 to TRW's purchase order. GAC settled TRW's 1990 claim for $600,000 and paid this amount under Amendment No. 34 to TRW's purchase order. (GAC R4, tab 3489 at 188)[4] GAC settled both claims on a "bottom line" basis, that is, on a lump sum basis without segregating the various reasons for the settlement (tr. 59/188). The settlement payments were budgeted through use of appellant's management reserve (tr. 59/122).

58. Mr. Ziegler reviewed both TRW claims for technical content and accuracy, but did not review the quantum aspects of the claims (tr. 43/197, 212). Appellant provided no witnesses and no documentary evidence to support any quantum factfinding or negotiation of these claims. GAC did not introduce into evidence the settlement documents, or any documentary evidence supporting or explaining the basis for the two settlements in the amounts indicated.

VIII. The Smith Industries' Subcontract and Settlement

59. Appellant has sought to recover its settlement of a subcontract claim, in the amount of $129,296, related to work for the software for the mission data preparation equipment (MDPE). We held in *Grumman I* that the AF was not responsible for additional costs related to this equipment (03-1 BCA at 159,246).

IX. GAC Claims Supported by the Evidence (*See Decision, Part II, Jury Verdict, infra.*)

Claim (3) Normal Accelerometer

60. In *Grumman I*, we found that the AF was responsible for the additional costs incurred by GAC to investigate, identify and address the wiring problems within STS No. 1 relating to the normal accelerometer (03-1 BCA at 159,194-195).

[4] We note that E&Y erred in computing the figures related to appellant's settlement of TRW's 1990 claim under Amendment No. 34 to the purchase order. The total settlement plus loadings, was $647,517, not $47,517 as indicated on page 188 of the damages calculation (GAC R4, tab 3489).

61. During performance, GAC sought input from its labor departments to quantify this out-of-scope work. By memorandum dated 27 March 1989, the GAC engineering department, provided a statement of work and a related manhour estimate - 560 manhours for systems engineering for RC-10 Group 551; and 684 manhours for software engineering for RC-10 Group 576 -- in the total amount of 1,244 manhours. The memorandum was initialed in the lower left hand corner by a number of GAC managers under the contract. (AF R4 supp. 2nd, tab 1498.470) On 1 May 1989, the ILS program manager also provided an estimate for this work, in the amount of 46 manhours (AF R4 supp. 2nd, tab 1498.485), for a total of 1290 hours. These estimates, plus an estimate of 360 manhours for program management, were incorporated into appellant's REA to the CO dated 6 July 1989, seeking an increased target cost for this work of $124,430. [5] Appellant enclosed an itemized cost breakdown, describing the scope of the work per claimed labor code, the estimated hours of work related to each code, plus overhead and profit. (GAC R4, tab 1166)

62. The AF reviewed appellant's proposal and questioned the quantum, stating that the overall dollars requested by appellant were "high" (GAC R4, tab 1172). As for us, we find that appellant's claimed program management costs, *i.e.*, the 360 manhours plus applicable burdens, were not reasonably supported in the proposal.

63. Appellant reasserted its contentions as part of its omnibus REA of June 1991, updated in May 1993 (R4, tabs 936, 979). The CO conducted fact-finding on the REA, and by letter to appellant dated 26 August 1993 determined that appellant was entitled to recover $24,960 to correct the normal accelerometer problem (R4, tab 985). Appellant refused to accept this amount.

64. Appellant reasserted its contentions as part of its claim dated 30 March 1994. The CO again found entitlement for appellant. However he denied any quantum recovery because he questioned the validity of appellant's total cost quantum methodology (R4, tab 999; ex. G-141 at 67-68).

65. We find that the evidence, much of which was introduced by the AF, is sufficient to allow us to make a fair and reasonable approximation of the damages related to this claim. In the nature of a jury verdict (*see Decision*, *infra*), we find that GAC is entitled to be reimbursed for 1,200 manhours for its out-of-scope efforts related to the normal accelerometer which, when multiplied by the burdened labor rate of $50.00 per hour (finding 46), comes to a cost recovery of $60,000.

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[5] There is no indication that this REA related to the preparation and filing of the omnibus REA of June, 1991, *see* note 2, *supra*.

Claim (7) SINU

66. In *Grumman I,* the Board found GAC was entitled to recover its additional integration costs caused by the AF's failure to timely deliver reasonably accurate, complete and suitable SINU boxes, which were GFP under the contract (03-1 at 159,210-211). During contract performance, GAC did not file a separate proposal for equitable adjustment related to these out-of-scope costs. In its amended quantum brief, appellant seeks a recovery of roughly $1.4 million for its out-of-scope SINU effort, based upon a claimed mathematical relationship between its proposed GPS and SINU costs, which it then applies to the price of contract modifications for out-of-scope GPS effort. Appellant argues that since SINU proposed effort was 87% of proposed GPS effort, and since the AF paid out $1,698,713 under GPS contract modifications, appellant must be entitled to 87% of the price of the GPS modifications, or $1,477,881. (App. amended quantum br. at 156) GAC offered no witnesses and no documentary evidence to establish this relationship between in scope and out-of-scope SINU and GPS costs, and we find that this $1.4 million claim is unsupported.

67. By memorandum dated 21 March 1988, GAC engineering submitted to the GAC corporate estimating office a detailed breakdown of additional RC-10 engineering hours to address SINU anomalies to date, in the amount of 626 manhours (AF R4 supp. 2nd, tab 1630.323). We find this evidence, introduced by the AF, was comprehensive, contemporaneous, and reasonable. We have held that GAC also incurred additional SINU related costs between 1988-1990 (*see Grumman I,* 03-1 BCA at 159,207-211), but appellant has provided no credible quantum evidence to support these costs during this period.

68. Based upon the evidence above, we find that GAC is entitled to recover for 626 manhours related to SINU problems, which, when multiplied by the burdened labor rate of $50.00 per hour (finding 46), comes to a cost recovery of $31,300.[6]

Claim (11) Cockpit Video System

69. In *Grumman I,* we concluded that the cockpit video systems directed by the AF for the F-111A/E and EF-111A were out-of-scope (03-1 BCA at 159,216). On 10 October 1988, P. Assey, GAC corporate estimating, sought input from relevant GAC departments to perform this, and other out-of-scope work (AF R4 supp. 2nd, tab 1963.022

[6] In our analysis of certain sustained claims, *infra,* we have reduced appellant's figures by 10% to account for the fact that the figures are estimates. We do not do so for the SINU claim, given that these figures measure costs for only a portion of the contract period, to March, 1988, and do not include all SINU-related costs incurred throughout the contract.

at 027782). On 3 November 1988, GAC's Test & Evaluation Department provided its input for the cockpit video system work for the F-111A/E, describing in detail the additional tasks required (AF R4, supp. 2nd, tab 1963.05, paragraph 3.1 at 002784-85), and providing detailed individual manhour estimates for each task -- design, test, install and wire -- as required. In sum, GAC sought a total of 2,729 manhours to perform this work. (*Id.*)

70. On 31 January 1989, GAC submitted a proposal for equitable adjustment to the AF for this and other claimed out-of-scope work for the F-111A/E, seeking an increased target cost of $507,348, a target profit of $60,882 and a target price of $568,230 (GAC R4, tab 2455). The record does not contain any proposal for the EF-111A. The record does not show how much of the total claimed amount related to the cockpit video systems as opposed to other claimed out-of-scope work. It does not appear that the AF acted on appellant's proposal.

71. Appellant's REA of June 1991, as revised in May 1993, also sought reimbursement for these costs (R4, tabs 936, 979). Insofar as pertinent, the CO replied to the REA as follows:

> Finally, [I] find that the Cockpit Video System was not a contractual requirement for the F-111A or the EF-111A AMP trial aircraft and thus was a change to the contract for which Grumman is entitled to be compensated. I further find that Grumman was directed to perform additional TFR measurements which was a change to the contract for which Grumman is entitled to compensation for the EF-111A trial aircraft [*see infra*]. Accordingly, I find that Grumman is entitled to $344,729.00.

(R4, tab 985 at 10)

72. The record does not provide the source data upon which the CO relied to come up with this figure. Appellant did not accept the CO's determination, and reasserted its position in its claim dated 30 March 1994 (R4, tab 991). The CO's decision dated 30 September 1994 repeated verbatim the findings on entitlement above, but omitted the last sentence regarding quantum (R4, tab 999 at 17).

73. We find the evidence, as introduced by the AF, is sufficient to allow us to make a fair and reasonable approximation of damages related to this claim. We find that appellant's 3 November 1988 estimate was comprehensive and credible, subject to the following adjustments. Appellant's estimate of 248 manhours to perform under ¶ 3.1.11, Instrumentation, Planning and Control, was vaguely described and appears to be based

upon an unsupported plug number of 10%, which we question in its entirety. We also reduce the balance of the claimed amount by 10 percent to account for the use of these estimates.

74. Based upon GAC's claimed manhour figures as adjusted, in the amount of 2,233 hours (2,729 claimed hours less 248 hours, less 10%) multiplied by the burdened labor hourly rate of $50.00 per hour (finding 46), we find in the nature of a jury verdict that appellant is entitled to recover costs in the amount of $111,650 for this additional work for the F-111A/E. Appellant did not offer any credible evidence from which we could make a fair and reasonable assessment of damages for the EF-111A.[7]

Claim (24) TSPI

75. In *Grumman I*, we concluded that GAC was entitled to recover the additional costs incurred to correlate TSPI data during flight test. The evidence showed that appellant expended roughly 24 hours per week in this effort over roughly a 48-week period, between 30 April 1989 and 31 March 1990 (03-1 BCA at 159,246-249), which we calculate as 1,152 manhours (48 weeks times 24 hours per week). In the nature of a jury verdict, we reduce these estimated hours by 10%. Based upon the burdened labor rate of $50.00 per hour (finding 46) we find that appellant is entitled to recover costs in the amount of $51,850 (1,037 hours x $50.00) for this additional work.

Claim (25) MTS Installation Delay

76. In *Grumman I*, we concluded that GAC was entitled to recover additional costs related to the AF's delayed installation of the upgraded maintenance training set (MTS) kits, and the related delay to appellant's support work (03-1 BCA at 159,252). As a result of the AF delay, GAC incurred extra costs to retain a number of specialized ILS employees on the program payroll throughout the delay period, less those hours spent on alternate work assignments, until such time as the AF was ready to do the installation (tr. 48/62; ex. A-43 at 4; AF R4 supp. 2nd, tab 1963.088n at GMNAA 018398).

77. By letter to the AF dated 28 February 1990, GAC filed a proposal for equitable adjustment related to the AF delays, seeking additional costs in the amount of $93,147 (AF R4 supp. 2nd, tab 1963.088n). Appellant enclosed a statement of work, an SF 1411 and a pricing breakdown. Appellant claimed additional RC-13 ILS support engineering in the amount of 922 hours, which was calculated by taking the difference between the 10-week retention period for the assigned personnel less their hours employed in alternative work assignments (*id.* at GMNAA 018400, 018404).

[7] We note that in its amended quantum brief, appellant relies upon the REA quantum evidence we have stricken. *See* Section IV, *supra.*

78. We find these manhour calculations to be unreasonable. They are materially different from those prepared a week earlier by the ILS-Engineering project engineer, as set out in a memorandum from R. Farrell to E. Barkley dated 22 February 1990, in which ILS estimated the MTS slip impact to be 570 hours (adding 160, 235, and 175 hours) (AF R4 supp. 2nd, tab 1963.088m, *see also* tab 1963.088l). We also find that appellant's claim for additional RC-14 program management services, in the amount of 232 hours (*id*., tab 1963.088n at 018401-402), is unreasonably high, and we question whether all the program management services listed here were reasonably required to perform this work and in the amounts indicated.

79. We find that the evidence, most of which was introduced by the AF, is sufficient to determine a fair and reasonable approximation of the damage incurred as a result of this AF delay. In the nature of a jury verdict, we find that appellant is entitled to reimbursement for 650 manhours, to which we apply the burdened labor rate of $50.00 per hour (finding 46), for a cost recovery of $32,500.

Claim (26) Crew Station Review Team (CSRT) Meetings

80. In *Grumman I,* we concluded that GAC was entitled to an equitable adjustment as a result of improper AF rejection of FB common display pages, and other AF directions beyond contract requirements arising out of CSRT meetings (03-1 BCA at 159,255).

81. By letter to the AF dated 2 July 1987, GAC submitted a detailed, 53-page proposal for equitable adjustment for these out-of-scope AF directions related to the F-111A/E. Appellant identified each out-of-scope action item; the nature of the AF direction; the reasons why the AF direction was out-of-scope; specified in detail the work to be performed and quantified the extra effort. (AF R4 supp., tab 1907) We find this evidence, introduced by the AF, to be contemporary, comprehensive and persuasive. Insofar as the proposal related to extra TRW work, TRW also provided entitlement and quantum inputs, per each action item, that were used by GAC to support the proposal. This data came from a detailed TRW justification/rationale memo to H.R. Klein dated 2 April 1987 (GAC R4, tab 2385).

82. We find that the evidence is sufficient to make a fair and reasonable assessment of damages related to this work. We find that GAC is entitled to an equitable adjustment for the following F-111A/E action items, which we find to be out-of-scope consistent with our findings in *Grumman I,* in the amounts claimed below, less 10 percent to account for the estimates:

CSRT NO.	ACTION ITEM	TRW	ROCKWELL COLLINS	GAC RC-10 (Design Eng.)	GAC RC-14 (Prog Mngmt)
2	SDA-1	$ 6,638			
	SDA-4	$ 10,481			
	SDA-8	$ 3,156			
	SDA-12	$ 842			
	SDA-13	$ 842			
	SDA-16				
	SDA-18	$ 5,347			
	SDA-21	$ 10,180			
	SDA-23				
	SDA-25				
	SDA-26/4-11			88 HOURS	
3	3-3			60 HOURS	
	3-8	$ 5,562		56 HOURS	
4	4-15			40 HOURS	
	4-24			48 HOURS	
TOTAL		$ 43,048	0 (SEE BELOW)	292 HOURS	0 (SEE BELOW)

(AF R4 supp., tab 1907 at 1-53)

83. We convert GAC's RC-10 manhour entitlement to dollars by using the burdened labor rate of $50.00 per hour (finding 46). We grant recovery for GAC RC-10 labor for 263 hours (292 hours less 10%) at $50.00 per hour for a total amount of $13,150, and for TRW costs of $38,743 ($43,048 less 10%), for a total of $51,893.

84. GAC also sought reimbursement for additional costs claimed by subcontractor Rockwell International Corporation, Collins Government Avionics Division ("Rockwell Collins"). Unlike TRW, Rockwell Collins did not provide, and GAC did not include a detailed work description for each action item. Instead, appellant included a general statement of Rockwell Collins' tasks purportedly associated with all action items, which we find unpersuasive. Appellant did not offer any other quantum evidence from Rockwell Collins related to this claim. We find that the Rockwell Collins' request is unsupported by the evidence.

85. GAC also sought reimbursement for its RC-14 program management costs related to all claimed disputed action items. Appellant did not segregate program

management activities per action item, but listed a set of activities purportedly performed on all items. However, we have found entitlement on only some of the disputed action items, and appellant did not show that the same program management activities applied in equal measure to the meritorious and meritless items to enable us to calculate a fair weighted average cost. We find that appellant's claim for program management cost is unsupported by the evidence.

86. In *Grumman I*, we also found entitlement with respect to the AF's improper rejection of certain of appellant's display pages designed for the EF-111A (03-1 BCA at 159,255). Given our findings therein, and based upon the evidence of record provided by the AF on entitlement and quantum and cited in the chart below, we find that GAC is entitled to the following CSRT recovery related to the EF-111A, less 10 percent to account for the estimates:

CSRT No. Action Item	GAC RC-10 (AF R4, supp. 2nd, tab 1916.085)	TRW (AF R4, supp. 2nd, tab 1916.077)
1-10	60 hrs	
2-9	16 hrs.	$ 4,352
2-10	16 hrs.	5,407
2-16	16 hrs.	
3-1	40 hrs.	3,507
3-7	72 hrs.	1,922
TOTAL	220 hrs.	$15,188

87. We convert GAC's sustained RC-10 manhours into dollars by using the burdened labor rate of $50.00 per hour (finding 46). We find entitlement for RC-10 hours in the amount of 198 hours (220 hours less 10%) at $50.00 per hour, which comes to $9,900, plus TRW costs in the amount of $13,669 ($15,188 less 10%) for a total recovery of $23,569 for the EF-111A.

88. Appellant also seeks reimbursement for program management and operations costs related to all claimed action items for the EF-111A. For the same reasons stated above regarding the F-111A/E program management costs, we find this portion of the claim is unsupported by any credible evidence.

89. In sum, we find that GAC is entitled to recover costs in the amount of $75,462 ($51,893 plus $23,569) for out-of-scope work related to CSRT meetings.

X. GAC Claims Unsupported by Evidence:
Claim (2)(a) GAC FB STS Software Data; Claim (6) Ballistics Data; Claim (7) Kalman Filter; Claim (8) Standard Central Air Data Computer (SCADC); Claim (15) Single Point Failure; Claim (16) Ground Velocity Signal Wires; Claim (27) STRs/FPRs; Claim (28) Excessive Documentation.

90. In *Grumman I*, we found that GAC was entitled to recover its proven out-of-scope costs for the following: the AF's failure to deliver timely and accurate FB STS software data (03-1 BCA at 159,193), appellant's analysis of ballistics data updates and the costs to investigate and correct STRS 978, 1055, 1116, and 1117 (03-1 BCA at 159,207) and appellant's costs to investigate and address the SCADC cycle-off problem at .44 Mach (03-1 BCA 159,213). We also found entitlement on appellant's signal point failure claim (03-1 BCA at 159,225), ground velocity signal wires claim (03-1 BCA at 159,229) and entitlement, in part, on its excessive documentation claim (03-1 BCA at 159,260). However, the record does not contain any credible quantum evidence from which the Board may determine a fair and reasonable approximation of appellant's damages with respect to these claims. Accordingly, we must find that these quantum claims are unsupported.[8]

91. In *Grumman I*, we also found entitlement for out-of-scope work related to the Kalman filter (03-1 BCA at 159,210). In an internal GAC memorandum dated 24 April 1987 from Ms. P. Pagano to Mr. B. Egner entitled "Underestimated Engineering AMP Tasks" (Pagano memo), Ms. Pagano indicated that 8,217 manhours had been expended in Kalman filter development (AF R4, supp. 2nd, tab 1361.279 at 043402). The memo, however, did not distinguish between in scope and out-of-scope effort. Mr. Warner, GAC's project software engineer, testified and we find that he had no reason to believe there was any Kalman filter overrun as of this date, and to the extent the memo could be so construed, the manhour assessment was inaccurate (tr. 35/102). He also testified that the Kalman filter manhours referenced in the memo made no sense, and that given the individuals involved, their time did not add up to anywhere near 8,217 manhours, but rather somewhere in the 2,500-2,700 manhour range (tr. 35/113-114). Even so, Mr. Warner's estimate did not distinguish between in scope and out-of-scope effort. In addition, the subject line of the Pagano memo referred to "underestimating" tasks, and absent evidence from the author, we do not know whether this underestimating involved poor bidding judgment by GAC -- for which GAC would be responsible – or unanticipated additional work for which the AF would be responsible. We find that the Pagano memo is not a credible source of quantum data for out-of-scope work on the Kalman filter.

[8] With respect to the FB STS and single point failure claims, we note that appellant now relies upon REA quantum evidence that we have stricken and cannot consider. *See* Section IV, *supra*.

92. This discredited 8,217 manhour figure found its way into GAC variance analysis reports dated 10 February 1988 and 11 November 1988 as out-of-scope Kalman filter design effort (GAC R4, tabs 3515, 3530). Ms. Pagano advised Mr. Warner that this manhour figure "belonged" on the reports (tr. 35/103). Appellant did not provide any credible evidence to explain the source of this out-of-scope manhour figure. We find that these variance analysis reports do not provide credible evidence regarding the extent of out-of-scope Kalman filter work.

93. Based upon the foregoing, we find that GAC failed to provide any credible evidence to allow us to make a fair and reasonable approximation of damages related to the out-of-scope work on the Kalman filter.

94. In *Grumman I*, we also found entitlement relating to a number of out-of-scope STRs and FPRs (03-1 BCA at 159,259). Appellant did not submit a separate proposal for equitable adjustment for this work during contract performance, but did include this matter as part of its omnibus REA dated June, 1991, as modified in May, 1993. In reply to the REA, the CO determined that GAC was entitled to an aggregate amount of $40,949 for nine out-of-scope STRs (R4, tab 985 at 8), but in response to appellant's March, 1994 claim, he acknowledged entitlement but did not specify any quantum (R4, tab 999 at 14).

95. In its amended quantum brief, appellant relies upon the CO's decision on the REA to develop an "average CO award amount per STR", which, when multiplied by the number of out-of-scope STRs and FPRs found by the Board in *Grumman I*, is the amount to which GAC claims it is entitled (app. amended quantum br. at 166-67). For reasons stated in the *Decision, infra*, we find that appellant may not rely upon the CO's figures in support of its claim. We find that this quantum claim is otherwise unsupported.

96. GAC's March, 1994 claim included a request to recover costs to prepare the omnibus 1991/1993 REA. At trial, appellant represented to the Board that the claimed costs were those internally incurred by GAC, and did not include any outside counsel charges (tr. 65/270). Appellant represented that for purposes of its claim, it was solely relying upon the damages calculated by E&Y, which did not include any costs for legal fees related to the REA (tr. 65/270-72).

97. Appellant did not offer any witnesses to address these claimed REA preparation costs by nature or amount. Nor did appellant offer any documentary evidence on the subject. We find that GAC abandoned this claim. If not abandoned, we find that it is unsupported.

XI. Profit

98. GAC sought 15% profit on its March, 1994 claim, contending that this project was analogous to its J-STARS development contract on which it proposed a 15% target fee. E&Y accepted GAC's rationale and included a 15% profit in its damages calculation (ex. A-32A at 30; ex. A-33 at 50). E&Y did not perform any independent review of appellant's corporate records in support of the claimed profit rate, nor does it appear that it reviewed the J-STARS contract relied upon by GAC. The J-STARS contract and its bid papers are not in evidence.

99. As awarded, this fixed-price incentive fee contract included a target profit rate of 6% of target cost (GAC R4, tab 3140 at 0006984; tr. 42/72). Through P00110, excluding the cumulative costs for firm fixed price tasks, the cumulative contract target cost was $115,297,647, and the cumulative target profit was $7,743,232, or roughly 6.7 percent of target cost (R4, vol. 80, tab 1 EZ at 6). Appellant offered no credible testimony or documentary evidence on the subject of appellant's bid or earned profit under similar contracts during the relevant period. Based upon the evidence of record, we find that a profit rate of 6.7% is reasonable for purposes of an equitable adjustment.

DECISION

As a threshold matter, the AF contends that since appellant failed to use actual cost data to support its claims, it is not entitled to an equitable adjustment on any of the claims upon which the Board found entitlement in *Grumman I*. GAC's accounting and cost measurement systems were technically capable of segregating costs as a general proposition, and the record shows that appellant did in fact attempt such segregation in certain isolated instances. (Finding 10) However given the nature, extent and timing of appellant's many claims (findings 11, 12), we are persuaded that it was impracticable for GAC to reasonably and accurately prove the claims directly through actual cost data. *See Grumman Aerospace Corp.* (*on behalf of Rohr Corp.*), ASBCA No. 50090, 01-1 BCA ¶ 31,316 at 154,646, *aff'd*, 34 Fed. Appx. 710 (Fed. Cir. 2002). For this reason we shall not deny all recovery to appellant solely because it did not use actual cost data to support its claims.

I. The Modified Total Cost Method

Appellant used the "modified total cost method" (MTCM) to calculate its damages. "The modified total cost method is the total cost method adjusted for any deficiencies in the contractor's proof in satisfying the requirements of the total cost method (citation omitted)." *Propellex Corp. v. Brownlee*, 342 F.3d 1335, 1339 (Fed. Cir. 2003). Notwithstanding the adjustments, the claimant must still prove 4 key elements in

order to recover under the MTCM: "(1) the impracticability of proving its actual losses directly; (2) the reasonableness of its bid; (3) the reasonableness of its actual costs; and (4) lack of responsibility for the added costs." (*Id*.)

GAC has satisfied the first prong of the MTCM test, that is, that it was impracticable to prove all its losses directly through actual cost data. However for reasons stated below, we believe that appellant has failed to prove the other three elements, and may not use the MTCM to calculate its damages.

Appellant has failed to prove the reasonableness of its bid costs, the second prong of the MTCM test. In our view, appellant's evidence failed to adequately reconcile its position regarding the reasonableness of its bid for purposes of the MTCM and its claim to the CO in March, 1994 that it made a unilateral bid mistake regarding the amount of its bid. Appellant also failed to satisfactorily address the important contemporaneous concession of its president during contract performance that GAC failed to properly account for the magnitude of the software effort. The record also shows that the costs of other work activities were only considered by GAC after award. (Findings 16-19)

We are mindful that pre-award, the AF found appellant's BAFO price was reasonable, based upon certain assumptions (finding 14). However, based upon the weight of the evidence we are not persuaded that this pre-award assessment binds the Board on this important issue. The record provides us with no reasonable basis upon which to adjust the appellant's BAFO – or the contract target cost budget baseline used by E&Y – to reflect the understatement of appellant's bid costs.

Assuming *arguendo*, that appellant met this second prong of the MTCM test, we believe that it failed to prove the third prong of the MTCM test – the reasonableness of its actual costs. Appellant relies upon GDC's proposed cost figures and the AF ICE for this purpose. However the record shows that the GDC cost proposal was unreasonable, and the relevance of the ICE was questioned (findings 22, 23). We conclude that GAC failed to meet its burden of proof on such weak and unconvincing evidence. The record provides no reasonable basis upon which we can adjust appellant's actual incurred costs to account for the unreasonableness of these costs.

Most importantly and most clearly, appellant failed to prove the fourth prong of the MTCM test – its lack of responsibility for the claimed cost overruns. As stated in *Raytheon Co. v. White*, 305 F.3d 1354, 1365 (Fed. Cir. 2002):

> In examining claims based on a total cost or a modified total cost methodology, we have always required safeguards to ensure, to the extent possible, that the burden of excess

> expenditures falls on the party responsible for them. (Citation omitted)

The Board found in *Grumman I* that appellant was responsible, in whole or part, for additional costs incurred under approximately 14 claims. The Board also found appellant responsible for additional software labor costs related to its claim for backup functions and memory reserve (03-1 BCA at 159,204). Appellant's MTCM damage assessment failed to exclude these costs. The record provides no reasonable basis upon which we can adjust appellant's actual incurred cost to account for the costs for which it was responsible (*see* below).

Apparently mindful of this weakness under prong (4) of the MTCM test, appellant developed a number of alternative quantifications in its amended quantum brief in an attempt to isolate and segregate AF cost responsibility (*see* Section III, *supra*). These allocations of responsibility were not adopted by E&Y or by any contractor witness, nor were they reasonably supported by any documentary evidence of record. Nor did the Board in *Grumman I* or *Grumman II* adopt these quantifications expressly or impliedly.

We reject these claimed quantifications as unsupported legal argument. They are arbitrary, mathematical constructs with no reasonable support in the record. Appellant has not persuaded us that any of these quantifications may be used to fairly and reasonably demonstrate the costs for which the AF was responsible under prong (4) of the MTCM test.[9]

In view of the foregoing, we are unable to accept appellant's use of the MTCM theory to quantify its damages under the circumstances of this case.

II. Jury Verdict

Alternatively, GAC seeks a jury verdict on all 14 claims sustained by the Board in *Grumman I*. Appellant has the burden to demonstrate entitlement to a jury verdict. The claimant must show clear proof of injury; that there is no more reliable method of computing damages; and that the evidence is sufficient to make a fair and reasonable approximation of damages. The claimant must show a justifiable inability to substantiate its claim by direct and specific proof. *See Dawco Constr., Inc., v. United States*, 930 F.2d 872, 880-81 (Fed. Cir. 1991), *overruled in part on other grounds, Reflectone, Inc. v. Dalton*, 60 F.3d 1572 (Fed. Cir. 1995) (*en banc*). *See NavCom Defense Electronics, Inc.*, ASBCA Nos. 50767, *et al.*, 01-2 BCA ¶ 31,546 at 155,786, *rev'd in part on other grounds*, 53 Fed. Appx. 897 (Fed. Cir. 2002).

[9] Given our conclusions, we deny as moot the AF motion to strike appellant's quantum brief for including these quantifications.

We concluded in *Grumman I* that appellant generally showed proof of injury on the claims we sustained, and we have concluded herein that it was impracticable for appellant to segregate each of its claims by the direct proof of actual cost, and hence its failure to do so was reasonably justified. However, in order for the Board to grant an equitable adjustment on a particular claim, there must be sufficient evidence to allow the Board to make a fair and reasonable approximation of damages. *See Bluebonnet Savings Bank, F.S.B. v. United States*, 266 F.3d 1348, 1355 (Fed. Cir. 2001). Generally, we conclude that the evidence was not sufficient to allow us to make such assessments, except for the six claims that we have addressed in our findings. *See* Section IX, *supra*.

III. Claims Unsupported by the Evidence

1. The CO's Review of the REA

As an alternative to its modified total cost and jury verdict theories, GAC suggests in its amended quantum brief that the Board consider damages on individual claims by relying upon quantum figures in the CO's review of appellant's omnibus REA.

We must deny this request for a number of reasons. First, the record does not provide any supporting cost data for the CO's figures that we could independently review for purposes of granting an equitable adjustment. Second, when appellant modified its REA and presented its March, 1994 claim, the CO also modified his position and withdrew any acknowledgment of any specified damages. Third and most importantly, it is well settled that a CO finding of quantum on a contractor claim (that has not been accepted by a contractor as part of a settlement) is not an evidentiary admission of government liability. A contractor has the burden to prove liability and damages *de novo* in an appeal to this Board. *Wilner v. United States*, 24 F.3d 1397 (Fed. Cir. 1994). It was GAC's burden to prove the damages it incurred as a result of the AF's actions or inactions through the use of sufficiently credible evidence that would allow the Board to make a fair and reasonable assessment of damages under established legal principles. GAC is not entitled to an equitable adjustment based upon the CO's figures.

2. The TRW Settlements

GAC seeks to recover the costs it incurred – $4,000,000 – to settle TRW's 1988 and 1990 claims. We cannot include this settlement as part of appellant's equitable adjustment because the record does not show that this settlement was reasonable and included amounts solely attributable to the AF. Appellant's evidence regarding the basis for each of the settlements from a quantum perspective was virtually nonexistent. GAC offered no evidence from the persons actually involved in the quantum negotiations, nor did it offer any documentary evidence of any factfinding related to the negotiations.

Compare Delco Electronics Corp., v. United States, 17 Cl. Ct. 302 (1989) (court approves, with some qualification, subcontract settlements as part of an equitable adjustment where the record showed, among other things, prime contractor factfinding, arms-length negotiations, and corroborating DCAS reports/analyses).

The little we know about these settlements is that GAC and TRW settled the claims on a bottom line, lump sum basis (finding 57). However, we have found that a portion of TRW's claimed costs were attributable to appellant, not the AF (finding 55). We have no way of knowing on this record how much of the settlement was attributable to the AF and how much was attributable to GAC.

For reasons stated, we must deny GAC's quantum claim related to the TRW settlements. Given this disposition, we need not address the other contentions raised by the AF to support the denial of this claim.

3. The Smiths Industries' Settlement

Appellant sought to recover its settlement of a subcontract claim, in the amount of $129,296, related to software work for the mission data preparation equipment (MDPE). We held in *Grumman I* that the AF was not responsible for additional costs related to this equipment (finding 59). Hence, these claimed subcontract costs are not recoverable.

4. Other Claims Unsupported by the Evidence (*See* Section X, *supra*)

A contractor has the burden to prove the fundamental facts of liability and damages. *Wilner v. United States, supra*. Based upon our findings herein, we conclude that GAC has failed to provide sufficient evidence from which we could assess a fair and reasonable approximation of the damages. Accordingly, we must deny any quantum recovery on these claims.

CONCLUSION

Based upon our findings, Section IX, *supra*, appellant is entitled to recover costs under the following claims:

Claim 3 Normal Accelerometer	$ 60,000
Claim 7 SINU	$ 31,300
Claim 11 Cockpit Video System	$111,650
Claim 24 TSPI	$ 51,850
Claim 25 MTS Installation Delay	$ 32,500
Claim 26 CSRT Meetings	$ 75,462
Subtotal	$362,762
Profit[10] at 6.7%	$ 24,305
Total	$387,067

GAC is entitled to $387,067 plus interest under the CDA from the date the CO received appellant's claim dated 30 March 1994, until payment. The appeal is sustained in part, consistent with this opinion.

Dated: 27 February 2006

JACK DELMAN
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

RICHARD SHACKLEFORD
Administrative Judge
Acting Vice Chairman
Armed Services Board
of Contract Appeals

[10] Notwithstanding that GAC may have been in a loss position because of bidding misjudgments and/or its own performance problems, it is entitled to a reasonable profit on additional work for which the government is responsible as part of an equitable adjustment under the contract. *See Stewart & Stevenson Services, Inc.*, 97-2 BCA ¶ 29,252 at 145,522-23, *aff'd on recon.*, 98-1 BCA ¶ 29,653.

I certify that the foregoing is a true copy of the Opinion and Decision of the Armed Services Board of Contract Appeals in ASBCA No. 48006, Appeal of Grumman Aerospace Corporation, rendered in conformance with the Board's Charter.

Dated:

CATHERINE A. STANTON
Recorder, Armed Services
Board of Contract Appeals