Contractual Issues in Technical Monitoring

R. Barto
Spacecraft Digital Electronics
3312 Moonlight, El Paso, Texas 79904

Abstract

Although a project's contract is not one of the project's technical issues, lack of knowledge of it can hinder the resolution of technical issues that have become controversial between customer and contractor. The goals of this paper are to raise awareness of the importance of the contract by discussing what one should look for in the contract, who needs to be aware of it, how it can be used and should be respected, and to encourage the reading of the contract by all program personnel.

I. Introduction

Contracts are a fixture of every program, but are usually unseen by most of the program personnel. The contract states, to some degree of detail, the functional and performance requirements of the item being built. Also generally specified are test and analysis requirements and critical dates. The main focus of this paper is on what might be the most important part of a contract: the specification of contractor requirements and customer rights as to visibility and deliverables. Experience shows that it is over customer rights that most of the controversy between contractor and customer arises. And, since the ability of a customer to monitor the project's progress hinges on visibility, it is important that both contractor and customer fully understand this aspect of the contract.

II. Visibility

The visibility the customer needs for effective monitoring is the ability to review work in progress. There are varying levels of visibility. The customer may be limited to access only to material presented at formal reviews such as the critical design review (CDR). In this case, most of the progress of project would be invisible to the customer, and it might not be possible to make a correct assessment of the project's status. Having access to internal peer reviews and other informal reviews enhances the customer's ability to understand the project's progress. The highest level of visibility is the ability to review all work in progress at any time. Experience shows that greater levels of visibility are conducive to higher quality in the resulting system, assuming that the customer has sufficient expertise in the field.

III. Deliverables

While the result of a project is deliverable to the customer, other items can be useful to the customer to assess the quality of the product being received. These include test plans, test results, schematics, and analyses. To receive, or in some cases even to view, these items may require that the customer sign a non-disclosure agreement (NDA).

There are three basic levels of deliverability. The strongest is deliverable for customer approval. This category should include items such as worst case analyses and test plans. A weaker category is deliverable for customer review. For items in this category, the contractor is probably not required to satisfy the customer by redoing work the customer finds inadequate. Items such as schematics and mechanical drawings can, however, be allowed to fall into this category, since if the customer finds something inadequate in them, it can be brought up to the contractor in the context of the analysis for that part of the system. The weakest level of deliverability is deliverable for information only. Items such as harness lists can be allowed to fall into this category. When the contract is being written or negotiated is the time to define the level of deliverability for all the items in the project. It would not bode well for the project to have a worst case analysis be deliverable for information only.

IV. Use of the Contract

An exemplary example of contract awareness is the International Telecommunication Satellite Organization (INTELSAT), which flies the world's largest fleet of geosynchronous telecommunication satellites. INTELSAT has never lost a spacecraft on orbit, and the fleet's high availability makes it very profitable. Every INTELSAT employee is given full access to the contract and is expected to understand it and enforce its terms when dealing with the contractor.

Personal experience shows two examples of contractors refusing to show schematics and analyses to the customer, claiming that they were proprietary. In one case, an INTESAT project, the contract was immediately available in the meeting, and the contractor was shown the contractual requirement to deliver the items. In the other case, a non-INTELSAT project, no one in the meeting had read the contract, much less had it available. Consequently the items were not delivered immediately. In each case, the items were ultimately delivered, because in each case they were deliverables, and reviews of them showed problems that the customer was not aware of.

In another example, a contractor argued to not conduct some tests in order to save cost and schedule. The issue was resolved when the contractor was shown that the contract required the test to be run, and it was.

V. Staying Within The Contract

One thing that all project personnel should be mindful of is, who can change the contract? Clearly, the contractor cannot unilaterally change any terms of the contract, but it is also true that no one on the customer side can unilaterally change it, either. If, for example, the contractor argues to eliminate some required test, no customer representative has the authority to agree to it, no matter how strong the contractor's technical argument is. It should be assumed that the technical monitors and other customer representatives must take the most strict interpretation of the contract possible and cannot change any of its terms. At the interface between the customer and contractor is where the contract is enforced.

For example, if a project's contract calls for 10 thermal/vacuum (T/V) test cycles but a customer representative thinks that 20 would be better, making this change is probably beyond the representative's authority. The contractor would justifiably claim that the new requirement was out of scope and require that the contract be renegotiated to pay the contractor more and provide schedule relief. On the other hand, if the contract calls for 20 T/V cycles, but the customer representative thinks 10 is sufficient, this change, too, is probably beyond the representative's authority. The contract would need to be renegotiated with all the technical issues considered, and the customer should expect some money back. In either case, without sticking to the contract and renegotiating as required, the contract is being ignored.

In an INTELSAT project, not even the program manager has the authority to unilaterally renegotiate the contract with the contractor. The contract is held on both the customer and contractor sides by the respective organizations, not by any of the project personnel. This is likely to be true on any project. So, in seeking to change the contract, one must determine exactly who has the authority to make changes. Furthermore, it must be remembered that the contract represents an agreement between the two organizations: each side has agreed to do certain things in return for the other side doing other certain things, all these things being spelled out in the contract. Those are the rules of the project, and if either side allows the other side to break the rules without calling them on it, the goals of the project would be seriously jeopardized.

VI. Writing a Contract

When the contract is being written and negotiated is the time to put into it all the things that will be desired later. Once the contract is signed, it's pretty hard to levy new requirements such as WCA or test requirements. Many of the battles between contractor and customer arise from tasks that were incompletely specified in the contract. If the customer expects a complete WCA, it's best to clearly define what a complete WCA entails at the outset so that after the contract is signed, both sides understand exactly what work is to be done.

Before the contract is signed is the time for the customer to decide how much visibility is desired, and at what levels various items are to be delivered. How much input does the customer want to have on test plans, and is there a particular format the customer would like to have the test results delivered in? After the contract is signed, a contractor who is reluctant to allow much customer involvement may refuse to accommodate the customer's request for higher visibility. But, even for a contractor who is eager to meet the customer's wishes, additional requirements may increase costs for which the contractor should be reimbursed.

VII. Conclusion

Management on both sides of a project should promote contract awareness at all project levels. Beyond knowing the functional and performance requirements of the system being built, everyone should be fully aware of the visibility and levels of deliverability the contract specifies, and the process for changing the contract. If project personnel are not aware of the contract's terms, there can be no expectation that the terms, including functional and performance requirements, will be met at the end of the project. Awareness of the contract will help eliminate battles over the rights and responsibilities of the customer and contactor.