Contractual Relationships—An Essential Ingredient of the Quality-Assurance System

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The quality-assurance system is described briefly as a total engineering or systems approach to quality assurance that comprises not only the technical facets of construction but also the nontechnical facets (political, legal, economic, social, environmental, and human) that should be part of all good engineering. It shows that contractual relationships that are a subsystem of the overall system have been traditionally an adversary relationship between the owner and contractor and thus have slowed the work and raised the cost. Frequently they have resulted in claims that were fought in courts. Defusion of such adversary relationships by equitable and fair specifications and contract documents and by engendering a team effort does away with all these negatives and, therefore, is advantageous to everyone concerned.

In a paper entitled, "What Is the Quality-Assurance System?" (1), I attempted to answer this question. Quality is defined as that of the finished project or structure, judged by how well it serves society physically, functionally, emotionally, environmentally, and, of course, economically--in other words, total quality.

This definition, because it is a total approach to quality, requires the systems approach to achieve it. What is the systems approach? The systems approach is more in the attitudes and ways of thinking than in formal procedures and methodology--it questions the obvious, it doubts long accepted conclusions until tested against others. Nothing is assumed to be true; every assumption is subject to inquiry.

Quality assurance, in its simplest terms, is a composite of everything that is done (studies, research, investigations, design, conclusions, communications, and feedback) to assure management that the right decisions are being made and that the right final things are being done. The earlier paper on the subject presented a chart, which is repeated here as Figure 1 (1). This shows graphically the high points of the quality-assurance system in construction.

DESCRIPTION

Initially, the need for some project is sensed by a politician or brought to his or her attention by interested groups, or, if a private project, the need for the project might be realized by the management of some company in order to carry out its work and growth most effectively. In our present day society, no matter how the idea gets started, one needs to keep in mind not only the technical and economic problems, but the human, environmental, and aesthetic factors, as well as legal, financial, and other miscellaneous items that have to enter the equation in order to be able to set up a time schedule and financing arrangements. The latter are the social factors that must be taken into consideration if the construction is to proceed smoothly and uninterrupted. If these factors are not carefully studied and planned and the various problems addressed and solved, then difficulties and delays will ensue and costs will escalate. It is essential, therefore, that the engineer get involved at this stage so that his or her input goes into the overall thinking. Otherwise, the engineer will inherit a project to design that ties one's hands behind one's back in many ways because he or she did not make sure that engineering ideas got into the overall thinking.

In essence then, quality assurance is a system that deals with the procedures for obtaining the quality level of construction needed for a project to perform the functions intended and to do so within the various human, social, environmental, and economic requirements and constraints. It encompasses the determining of the needs and will of the people or of an enterprise; political considerations; human, social, and environmental factors, and how these influence design, specifications, contractual relations, feedforward, production, quality control, sampling, testing, charting, inspection, decision making, and feedback; and the interactions of all these facets of the system with one another.

The details of how such a system should work can be found in the earlier paper (1) and need not be repeated. For this systems approach to be successful, communication becomes one of the most important facets of the whole. With proper communication everything moves smoothly and problems are solved, but without it, arguments develop and tempers get heated and often the work is delayed, costs escalate, and claims and counterclaims wind up in the courts, where only the lawyers will gain in the process.

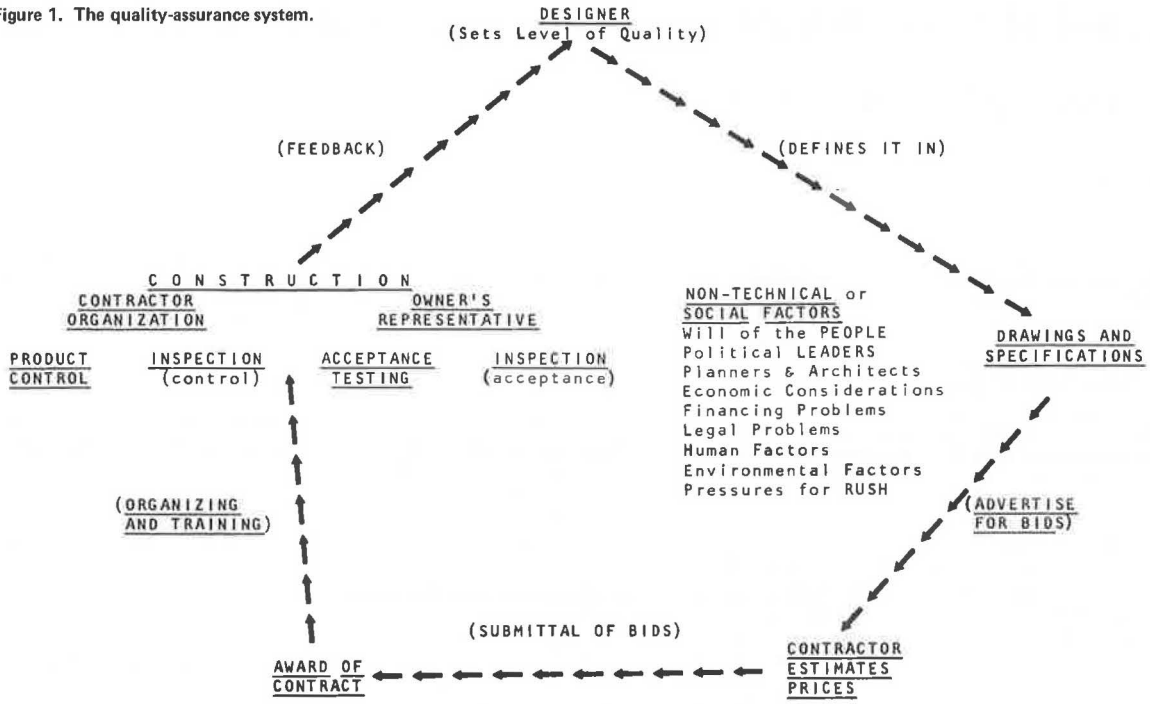
CONTRACTUAL RELATIONSHIPS

There is nowhere a greater need for smooth and effective communications for the success of the system than in the contractual relationships subsystem. One facet of contractual relationships brings up the question of how to reduce and defuse the adversary relationship that is so common in construction. This adversary relationship turns the work into a battlefield instead of what it should be--a cooperative effort between the owner and contractor, as a team, to get the job done most expeditiously and at the lowest cost consistent with the quality needed.

Some of the most important factors that lead to this adversary relationship are as follows:

1. The general practice of having specifications full of provisions such as, "as directed by the engineer," "as approved by the engineer," "as determined by the engineer," and "in order to satisfy the engineer," forces the contractor to bid more on the engineer than on the physical work. The engineer is left with the power to determine everything.
2. All contingencies are usually left to the contractor (the engineer even disclaims responsibility for the accuracy of information supplied in the contract documents, such as subsurface information that comes from the engineer's own investigations). This raises the cost, because the contractor has to allow contingencies for all this. Actually, rarely do all the contingencies come about, and thus the contractor is left with funds for contingencies that did not materialize and can increase his or her profit. It is much better to have the owner assume the contingencies and pay for them when they occur. This also saves arguments and heated tempers.

Figure 1. The quality-assurance system.



3. Arbitrary decisions by the owner's representatives are frequently made. These increase the cost because the contractor has been burned before and thus has allowed contingencies for such capriciousness.
4. Unrealistically tight limits that cannot be met realistically due to nature's variability abound in most specifications.
5. Bidding for the lowest price among unequal contractors results in poor work most of the time. A Hindu sage once said, "The bitterness of low quality remains long after the sweetness of low price is forgotten."
6. Specifications are meant to be a means of communication--that is, if they are clear and fair. Specifications should say what they mean and mean what they say; this is rarely the case. Jacobi wrote (2, p. 130):

> We should first try to establish communication, which leads to knowledge, which leads to trust, which leads to mutual respect....
>
> Once you get the communication, the trust, and mutual respect, one can at least see where individual positions differ and then find a common ground.

CONCLUSIONS

In the last few years I have reported on two projects where successful steps were taken to reduce the adversary relationship:

1. The Illinois Toll Highway, where there were some 65 contractors, hundreds of suppliers, and 24 consulting firms. It had less than one percent in claims, and all were settled through fair and friendly communications. This was because of team effort and realistic specifications that were in tune with nature. After all, nature does not read specifications.
2. Armco project 600, where the contractors turned back a portion of the money saved due to team effort and realistic specifications that were in tune with nature.

In closing, the Baltimore subway project has used approaches that have resulted in a cooperative relationship and smooth progress of the work. So, the trend appears to be for owners and contractors to work together as a team.

REFERENCES

1. E.A. Abdun-Nur. What Is a Quality-Assurance System? TRB, Transportation Research Record 613, 1976, pp. 51-55.
2. How the U.S. Performs on the World Stage. Fortune, Vol. 101, No. 10, May 19, 1980, pp. 124-130.