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The Impacts of Customer Inspectors on Shipbuilders

A shipyard had contracted to construct a naval vessel with the requirement that the shipyard provide facilities for a certain number of naval inspectors. Subsequent to the start of the project, the naval procurement staff (i.e, the customer) asked the contractor to provide a proposed contract modification to provide facilities for a certain number of additional naval inspectors who would be present for the remainder of the project (more than doubling the number of inspectors). The customer anticipated that the proposed amendment would cover only the rental of the additional office facilities and associated support for those additional inspectors. However, realizing that there would be additional impacts due the presence of the greater number of naval inspectors, the contractor asked Fisher Maritime to prepare an analysis of the expected impacts arising from the greater presence of naval inspectors. The following is a greatly consolidated synopsis of the analysis and evaluation.

Additional Inspectors Would Have More Than "Minimal" Impact

Fisher Maritime determined that the contractor could not accept the customer's assumption that there would be only minimal other impacts. It was noted that as the additional naval inspectors fulfilled their intended roles, they would be reviewing the contractor's detail drawings to a far greater extent than originally planned; they would be inspecting work in progress to a far greater extent; they would express numerous and more-diverse opinions on many more aspects of contractor's work (both engineering and production); and they would be questioning the adequacy of quality assurance and testing to a greater extent, as well.

The consequence of this would be that

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LESSON LEARNED #34: Owner Furnished Equipment

A tanker owner's plan to modernize a vessel resulted in the decision that the owner would supply a certain large item of new equipment to be installed by the US west coast shipyard. The owner selected a vendor based on low pricing, anticipating a savings of about $60,000 below what the shipyard's charge would have been. After the project commenced, however, the owner's team discovered that the selected vendor was unable to demonstrate that the component met the required testing and certification standards.

The vessel owner's team then had to re-order the component from another manufacturer, paying a premium for rushed completion. Moreover, because the newly selected vendor was far from the shipyard, the vessel owner's team had to charter an aircraft to rapidly transport the component from Texas to the US west coast. In the end, the anticipated savings of about $60,000 was replaced by extra costs in excess of $100,000 above what the shipyard's charge would have been.

If instead the vessel owner's staff had spent time to write a precise specification and had given the shipyard the responsibility to acquire the component in accordance with that specification, any and all those extra costs would have been for the shipyard's account.

The lesson learned: vessel owners should not use anticipated cost-savings as a basis for deciding to provide equipment as owner-furnished.

A newsletter for the Maritime Industries from:

FISHER MARITIME Consulting Group

Consulting Naval Architects
Marine Engineers
Project Managers

We appreciate your comments. You can reach us at:

800 732 3476
+1 973 660 1116
Fax: +1 973 660 1144

e-mail:
email@fishermaritime.com
www.fishermaritime.com

contractor personnel would have to respond to many more inquiries, defend many other decisions that were within the contractor's realm of responsibility, revise many more drawings, possibly modify already-completed work to accommodate the preferences of the inspectors, and likely have to re-test many functional capabilities to demonstrate compliance with alternate interpretations of the testing protocols.

In the process of converting the contract-level design to the final product, numerous detail decisions have to be made by the contractor. Through the contract's drawing-review clause, the customer has the right to review those decisions before the design details are 'translated' into tangible results in the form of a component, piece or element of the vessel.

LESSON LEARNED #35: Confirm with Vendors Before Specifying

A vessel owner's team set out to increase the refrigeration capacity of the vessel. Among other new components, this required the installation of several additional 250-amp breakers identical to ones already on the vessel. The owner's staff read the part number for the existing breakers, and directed the shipyard to order additional breakers using that part number to ensure commonality. What arrived, however, were only the casings for the breakers, not fitted with the internals. A separate part number was need for the internals, or an alternate part number for the combination of the internals plus casing. A last-minute contract amendment and extra installation costs were incurred.

The lesson learned: the owner's specification writers should confirm from the vendor that the identified part number is the appropriate one and that the product is currently being manufactured.

When naval inspectors review and challenge or question a detail decision that has been initially made by the contractor, the contractor often has to expend additional resources to allay the concerns, questions or challenges expressed by the inspector's review. It is those additional resource expenditures, among others, that translate into extra costs incurred by the contractor due to the presence of additional naval inspectors.

Engineering Impacts: The contractor does not wish to merely ignore the inquiries of the customer's inspectors, since that attitude may start deterioration of the contractual relationship, which should instead be one of mutual cooperation. Accordingly, when the inspection staff questions why certain detail decisions have been proposed by the contractor, or when the inspectors wish to have the contractor consider an alternative solution, the contractor has to investigate, analyze, consider and respond. All of this effort by the contractor consumes professional man-hours in both engineering and project management. Allowance in the contractor's budget and schedule for an appropriate number of professional man-hours was included for the initially nominated number of naval inspectors. Now, however, with additional inspectors the impact would be greater in both cost and schedule.

It was realized that the additional naval inspectors would generate inquiries that require a significant input from contractor personnel. Some of the responses may require less than one man-hour of the contractor's efforts; some may require several man-days of effort; but most of them likely would require a major portion of a full man-day. It was assessed that, on average, there would be an additional five contractor professional hours needed for each eight additional naval inspector hours, to investigate, analyze, consider and respond. That is, for each eight additional naval inspectors the shipbuilder would have to plan for the equivalent of five more full time persons on the engineering and project management staff.

Production Impacts: In addition to those engineering impacts, there would be impacts on the production work of the project. Perhaps the most apparent impacts would arise

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About the 'Lessons Learned' — The brief synopses of lessons learned included in this issue are adapted from analyses presented by participants in the regularly offered training course "Contract Management for Ship Construction, Repair and Design." (Please see back page for list of 2011 training programs.) Lessons Learned numbers 1–33 are based on Fisher Maritime's project management assignments, and can be found at: http://www.fishermaritime.com/Publications/PDF/FisherProjectInsights.pdf.

in association with inspection/quality deficiency reports issued by naval inspectors. Accordingly, there was a certainty that contractor would have to respond to a far greater number of inspection/quality deficiency reports due to the presence of additional naval inspectors.

When an inspection/quality deficiency report is issued, the contractor has to decide how to respond to it. If use of the naval inspector's alternate interpretation would be a significant cost or schedule burden on the contractor, the contractor's engineering staff may set about to educate the naval inspectors as to why the already accomplished work does, in fact, meet the contract requirements. However, if it is not too big a burden, in the interest of wanting to accommodate the customer's perspectives, the contractor may simply modify the already-accomplished work to satisfy the inspector's interpretation. This is not an acknowledgement of error by the contractor; rather, it is a business accommodation made only for the benefit of promoting a good relationship. But additional naval inspectors lead to a lot more of such accommodations being made since there is every reason to expect that each naval inspector will go about his/her work diligently. This rapid growth of accommodating actions due to the increase in the number of naval inspectors should not become the financial burden of the contractor.

Testing Impacts: In addition to the impacts on both engineering and production costs arising from the greater number of naval inspectors, there would be comparable impacts on tests and trials. Not only would the naval inspector's interpretation of testing requirements vary from those of the contractor, but the greater number of naval inspectors would result in multiple customer-proposed interpretations of how the standards and testing requirements are to be applied to the project. This means that the contractor has to address not only a proposed alternative interpretation of the standard or testing requirement, but also has to sort out the differences and ramifications of each of the multiple customer-identified alternatives and work with the team of naval inspectors to resolve their internal differences of opinion, as well. This would undoubtedly lead to multiple re-inspections and multiple re-tests to an extent far greater than if the number of naval inspectors was not significantly expanded. These production and testing impacts could easily exceed the engineering impacts if there is little control over the timing and/or extent of the interruptions that originate with the additional naval inspectors.

An example of multiple interpretations of a testing standard was for the examination of welds in the gas turbine anti-icing devices for the fleet of US Navy FFGs. The government interpreted the contractually-defined pipe weld inspection standard for steam plants, that now had to be applied to a gas turbine plant, to require radiographic examination of certain welds. The vendor interpreted the same inspection standard to require only dye-penetrant examination of the welds.

Under protest and claiming the extra costs, the considerably more expensive radiographic processes were applied to all 240 devices for 60 ships. The government's subsequent independent revision of the standard, extending it to apply to gas turbine plants, as well as the subsequent award by an arbitration panel, found the government interpretation to be invalid. The vendor was compensated accordingly.▲

Basis of Analyses: For over 35 years, Fisher Maritime Consulting Group has been providing consulting services to the maritime industry (ship owners, shipyards, major subcontractors, vendors, design consultancies), with particular emphasis on the development and management of projects at shipyards in six sub-areas:

(a) development of contracts (agreements, specifications, drawings) for ship construction, conversion, overhaul and/or design;
(b) project management support to one of the parties during project execution for complex projects and/or when client was not sufficiently experienced to undertake such project without supplemental expertise;
(c) development and/or rebuttal of claims by one party against the other in contract disputes involving vessels and shipyards;
(d) contract dispute resolution negotiations, as either neutrals shedding light on the issues for both parties, or as proponents for one of the parties.
(d) training of professional staff for the management of contracts and projects involving shipyard work (over 300 program presentations world-wide to more than 4000 persons);
(e) litigation support, expert witness and/or arbitration services involving disputed shipyard projects.

Additionally, Fisher Maritime's staff is internationally recognized as an authority in shipyard project and cost matters as evidenced by the diversity of their clients, past assignments and the key role of their authoritative publications. Fisher Maritime's clients have included many commercial and government agencies world wide in addition to many shipyards engaged in a wide variety of construction, conversion and repair projects.

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FISHER MARITIME
Consulting Group

Consulting Naval Architects and Marine Engineers, Project Managers

147 Columbia Turnpike, Suite 203
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C&CM: Contract and Change Management for Ship Construction, Repair and Design. This 3-day course is designed for all members of the contract management team for ship owners, shipyards, design firms, vendors, subcontractors, regulatory agencies, whether commercial or government. Senior and middle management of all those types of organizations benefit from the "lessons learned" approach to managing all contractual commitments.

		2011
Atlantic City, NJ	Wed. - Fri.	Mar. 16-18, 2011
London, UK	Wed. - Fri.	Apr. 27-29, 2011
Las Vegas, NV	Tues.-Thurs.	June 14-16, 2011
Toronto, Canada	Mon.-Wed.	Aug. 15-17, 2011
London, UK	Wed. - Fri.	Oct. 12-14, 2011
Portland, OR	Tues.-Thurs.	Nov. 8-10, 2011

TPEC: The Port Engineer's and Owner's Representative's Course. This 3-day course is designed for shipowner's personnel who prepare specifications, who accompany the ship to the shipyard, and who arrange for new/growth/change work during contract performance. This course helps assure getting maximum value for money spent.

		2011
Vancouver, Canada	Tues.-Thurs.	May 17-19, 2011
Pensacola, FL	Mon.-Wed.	Sept. 12-14, 2011

SMCC: Shipyard Management of the Customer and Contract. This 2-day course for project managers, production supervisors, estimators and planners is the only training program specifically developed for mid-level managers of shipyards and subcontractors. Presented in-house only. Contact Fisher Maritime for details.