

NOTES ON SHIP REPAIR AND CONVERSION MANAGEMENT

BY ROBERT R. HART

EDITED BY DR. KENNETH W. FISHER

Fisher Maritime Consulting Group

Florham Park, New Jersey

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Foreword

One of Bob Hart's last employments was on the teaching staff at the California Maritime Academy. Prior to that he was associated with commercial and naval shipyards, as you will discover below.

away, but has left the maritime industry this legacy of his appreciation and learning process. In reviewing it again, more than a decade later, its timelessness becomes evident.

Dr. Kenneth W. Fisher
South Orange, NJ
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1. Introduction

I am the last in a line of people who have stood up here today and very confidently talked to you about the problems of contract management. I don't have that same degree of self-confidence.

I started out as a ship operator; the first ten years of my professional life I was in the engineering department, becoming a chief engineer of a submarine. I've been in shipyards for normal overhauls, for conversions and even for emergency repairs when things didn't go quite right.

Later on, after retiring from the Navy, I went to work in private shipyards. I was unlucky. At those shipyards, we had trouble finishing the jobs on time. They said we had no schedule adherence, and the costs that we estimated for the jobs bore little resemblance to the costs we actually incurred.

I think that the one thing I realized and I hope you realize is that the ship is terribly complex. It is in fact a city all by itself, and much more complicated than a city because many cities don't have their own power system,





















**14. Questions and Answers •••••**

Dr. Fisher: You may recall yesterday we heard some not-too-nice comments about the use of computers in the shipyard. We just heard Bob Hart referring to the ability to use the computer to tell the shipyard's president by 8:30 in the morning whom he should chew out before lunch. We also know about 'garbage in equals garbage out'. What, I don't understand is how people who have built ships -- sometimes at a profit, but at least always built ships -- upon deciding that they were going to benefit from the computers, have used people without experience in ship construction to develop PERT or critical path analyses. I fail to understand why shipyard management, who previously relied so much on the judgment and the long-term experience of their personnel, then turned to inexperienced people to develop PERT charts for vessel construction and conversion. How can someone fresh out of graduate school or undergraduate school who knows nothing about shipyard operations or has been in a shipyard for only a year or two develop a PERT chart? Yet managements went ahead and did that. No wonder they got 'turned off' by the computers. It was not a matter of garbage in equals garbage out; it was a matter of the people behind the computer programs. Since I am one of the people who developed computer programs, to hear management people say that computer programs are not worth a dime makes me unhappy. What wasn't worth a dime was the decision as to who was going to develop them.

Seminar Attendee: Mr. Hart was talking about the repair of a ship; and most of his comments appear to apply to new construction as well. If there is one word that has caused me problems for the last thirty years, it is 'information', and the lack thereof. How can production produce until they have information that is necessary in the appropriate time frame? How can production, purchasing, planning, scheduling, materials control and all the other divisions get their act together when management doesn't get their act together up front? -- to get engineering information disseminated in time so that the other divisions can use it, and so that production doesn't get boxed in with a delivery date and no time to accomplish it?

Mr. Hart: At Ingalls, as manager of master planning and progressing, from the time we got a ship contract and developed the plan list and the MMES, I held a weekly conference on each

contract. We went over the technical requisitions, the plan list and the development of the plans to get ready for production. Production generally started work about one year after a contract was given. As we neared the end of this period and we were getting ready for production, the program manager for the ship came in and sat in on the conferences. From the time that he started outside fabrication, he started chairing the conference (replacing me), and I started dropping back. After that, I would just send a representative. But if I did my job well in that year, with the cooperation of planning and design, then the plan schedule was in good shape and the material was there in the shipyard. It is only by having somebody similarly responsible for the contracts, from the moment they arrive in the shipyard, that the scheduling runs so smoothly. But actually since my office did much of the work for the bid committee in preparing tentative building-way schedules, key event schedules and projections of manpower, we knew that contract pretty well by the day it arrived in the shipyard.

Seminar Attendee: In our yard the term "work around it" is very popular. Work around it if you don't have the information, the material, the proper facility, or the manpower. Work around it. What happens is that inefficiency sets in -- over-budget sets in. How do we get that information to avoid "working around it?" We have trouble getting information out of vendors, and I'm sure every design sub-contractor has the same problem -- especially during that 'up-front' time period when that information would be tremendously helpful.

Mr. Hart: It does not take as much effort as might be thought. I had only six people working for me. We prepared all the building way schedules, the key events schedules, and coordinated all the plan lists with the purchasing. All of us in my department were production oriented, and we were always watching for the material and the plans to be available when production wanted them. We did very well in those contracts, by working on the contract every day, from the time we got in the shipyard until production was ready to take over. After production took over, I had one man assigned to the contract who went to the conferences. I could not attend that many conferences as we had so many shipbuilding programs in the yard.

Seminar Attendee: You were speaking of job orders, sequences, trades, materials and similar specific information getting into the computer. How does it get there?

Mr. Hart: It gets in from the planners who write the jobs and scope them. We had a centralized job order department in Ingalls, which I think was a wrong way to do it. Ingalls moved all the detail planning from the shops into the centralized planning department. I think it works much better when the centralized department writes job orders and turns the detailed work planning over to the shops, giving them a start date and a completion date, but letting the shops organize the assist trades. If the shops have to plan the job, they are much more likely to try to finish it on time than if you just give them arbitrary figures from a centralized planning department and treat them like idiots. Shop planners are much more effective than centralized planning.

The actual feedback on work completed comes from the leading man's charge sheets at the end of the day -- how many man-hours his people worked and what jobs they were charged to. The charges are the same that go into the computer for pay purposes.

Seminar Attendee: Has anybody made a study of whether or not the end results justify the cost of maintaining a system of this nature? What we are primarily concerned with is the first-line supervisor's time and the control of costs for the book-keeping as well as for the people who work for him. Does the end justify the means?

Mr. Hart: It is going to take a leading man anywhere from 30 minutes to 60 minutes a day to do his paper work; he is going to take more than that amount of time goofing off and away from his trades. I have not been too happy with the performance of the leading men. There were many times when I had a problem aboard ship and I called for my leading men to come and clear it up, and not a single one answered the call. Many times I have gone to the offices at the head of the pier and kicked the leading men out. Part of the problem is not that the leading man doesn't have enough time to do the job; it is trying to get the leading man to use the time he has to do the job right. The paper work associated with the job should be kept to about one half hour to one hour of his time a day. If your system demands more than that from the leading man, then it is too complex. This system didn't. The charge numbers were very easy for him to determine.

Seminar Attendee: That one-half hour or so could be set aside daily, but invariably the leading man is going to be barraged by one particu-

lar problem or another. He's under pressure. He's in a position, depending on how many people are reporting to him, of having to record something like 15 digits correctly and on time. Our experience is that if you get any sort of number of digits like that, you get a high error rate in recording. I'm wondering what your experience was in this particular budget where you utilized this control system throughout. When you went back over the results of all the records, did they make sense to you?

Mr. Hart: Not always. But the charges were fairly accurate. Only a few of the digits change daily or weekly for each leading man, so it's not as if he has to remember many different sets of 15 digits each. As long as it is charged to the proper customer, the totals then will add up. What you are looking for is not the cost estimate on the individual job, but the total performance. When your performance goes down, then you have to ask for a more detailed run from the computer and look at the individual jobs that are giving you trouble and put pressure on them. You will find that if the jobs are well planned, the probability of overrunning is less. And if you put pressure on those jobs that are overrunning, you can generally clean up the cost.

Seminar Attendee: The problem is that if you use the computer, people generally start to believe exactly what it is telling them in detail, not just overall. As a practical matter, the probable use of this data as feedback to estimate future jobs is where inaccurate reporting will be felt and mis-used.

Mr. Hart: Well that occurs at the end of the whole program when we have completed the job and the planner wants to know how much it cost to finally put that lube oil system together. He is not interested in that day by day. He is interested in knowing how much it costs to finally put that lube oil system in. As far as the day to day operations were concerned, they only ran on the delinquent jobs and the work in progress. Periodically, about once a month, we had the computer print us out the status on all jobs for the use of the planning and estimating superintendent. Whoever is in charge of the planning is the man who analyzes that computer run and then feeds back the information to top management about what jobs are in trouble.

Seminar Attendee: You used the initials MMES a couple of times. What does that mean?

