

Managing repair information for project control

New software specifically developed for shiprepair contracts, called Epic, has been launched by UK company Incremental, based in Edinburgh, Scotland. The company was established in 2003 specifically to provide services to the shiprepair industry.

MANAGING and control of shiprepair differs significantly from both ship construction and major refit or conversion projects. Effective information systems are an essential facilitator for such operations. There has not been, until now, a system specifically designed to manage shiprepair contracts.

Central to preparation is the elapsed time available, since the time to be spent in the repair yard, and hence the delivery date, is, in nearly all cases, an absolute requirement. It is dependent on a critical path comprising the work items which take the longest times. Hence the first requirement in setting up a shiprepair contract is to create a preliminary schedule, based on several elements:

- proposed arrival and departure dates required by and specified by the shipowner
- expected dock and quay times, using past contract data
- total estimated man-hours and the numbers to be employed on the ship
- tasks to be completed, particularly those which require subcontractors and external services.

Of the tasks, only a few will be critical, and a simple network can use these to establish the critical path for a contract, at first without considering resources. Provided the times which are identified, and the associated resource levels are realistic (that is, the numbers required can be obtained and deployed), then an appropriate combination of subcontract and in-house resources can be used.

There is a further need to look across all the contracts which are current in a repair yard, and to take into account any enquiries which may be converted in the period covered by the yard's planning horizon. The rapidly changing contract situation, and the possibility of a damaged ship requiring immediate attention, also contributes to the volatility of the shiprepair situation.

This complexity in the industry, rapid changes in requirements - typically across several contracts, and the use of external resources has often inhibited preparation and planning. However, in recent years, changes in information technology (IT) and related areas have produced some improved opportunities for successful management.

Contract control

Nevertheless, preparation and planning continue to be the core contract control problems inherent in shiprepair. The first problem is that the forward workload is often not certain at the time of commencing contract work.

In particular, in almost all cases, whether highly specified or not, extra work will emerge as the

contract progresses. For repairers, the budget situation is also complex. In the first instance, there are few routine jobs which can be used as a basis for productivity measurement. Work such as hull cleaning or painting can be based on the specification and area to be covered, although the actual underwater hull condition, which is the starting point, may only be clear when the ship is docked.

More work may be necessary within a fixed price, resulting in a loss. This is avoided as far as possible, by not fixing prices where there is much uncertainty in the scope of the task. Once a fixed element is agreed, the situation in terms of the need to maintain a budget is similar to ship construction.

The management of a repair contract is therefore a difficult case of maintaining the end date against that background of continual variation in work content and therefore resource requirements.

The response of the shiprepair industry in Europe has generally been to develop a highly effective infrastructure of subcontractors, suppliers, and casual labour. In other areas, where labour costs are lower, the pressure on managing resources may be less and some under-utilisation of resources, particularly people, may be acceptable.

Information systems

Fundamental to the successful management of a shiprepair contract is the information management system with database. This goes beyond project management and keeping accounts, and must be dynamic. Ideally, the information is created as an estimate and then is developed so that all decisions, actions, purchases, man-hour expenditure and, perhaps most importantly, variations are accurately recorded. Then the information has to be made available in as close as possible to real time to selected staff.

To date, no appropriate and dedicated software has been available. Where conventional planning software is used, the overhead cost of continual updating devalues its use. At times, on a fast-moving contract, the planning system is struggling to keep up with actual happenings on the ship.

Other approaches to management of the shiprepair business are based on accounting software. This provides an accurate cost outcome (subject to the input information being correct), but is essentially designed for historical cost recording. It is not usually designed to include the flexibility in updating that shiprepair requires.

Epic: a new solution

To try and solve all these complex problems, an integrated contract management software package has now been launched by Incremental Ltd. Known as Epic, this is claimed as the first software product designed from day one for the repair industry and is said to be built upon real-life experience of information systems in repair yards. Epic hopes to provide the utility and features needed in the real world, and offers an unprecedented level of project control.

There is a need for a system which is specific to the shiprepair problem. The features of such a system can be specified, based on the factors which are critical to the successful management of a shiprepair contract. These features, which Epic hopes to provide, are:

Management of the client base

This is likely to be international, even for a small shipyard, and the system must track owners, agents, management companies, and the ships that they require to be repaired. The database must be accessible and updateable remotely, so information can be made available to the shipyard quickly and easily.

Management of enquiries

The typical repair contract is small and the success rate on enquiries is typically one in five. A large number of enquiries must be managed, linking these to the client data base and updating their status frequently. Maintaining a history of enquiries and their results is invaluable for marketing and enquiry management.

Estimating

Estimates can use past data, supplier estimates of cost, subcontractor rates and standard tariffs. Rapid and easy access to past estimates and contract data is a valuable addition to the process. Tracking information is also very important.

Production planning

Once an estimate has been converted to a contract, the estimate data must be converted into a work schedule, which is then maintained in an up-to-date form throughout as the scope changes. This schedule may take the form of a work list as it can be impractical to reflect the continual changes to job priorities and start dates.

Labour costs

Man-hours must be recorded efficiently and promptly so their cost can be assigned to specific tasks. Man-hour recording against tasks also provides the information necessary to support the payroll, whether this is internal or subcontracted.

Progress monitoring

The work schedule is also used as the base on which to track progress and record actual man-hours, and other costs. The state of a contract must be assessed quickly, along with its potential profitability. Problem areas must be quickly identifiable.

Purchasing

The system will facilitate the purchase of bought in items and services, ensuring that no costs are 'lost' to invoicing and production control. Estimated and final costs are made available as soon as they are known.

Invoicing

The completed work schedule, with the hours and costs for each task makes the development of an accurate invoice more straightforward. The outcome can be compared with the estimate and agreement can be managed more effectively. ☺