



Mechanisms for Shipyard Project Management

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The objective of this presentation is to lay out the fundamental objectives of the management of shipyard projects -- for both the Owner as well as the Contractor -- and to identify the mechanisms that are appropriate to achieving those objectives. It will be seen that most of the mechanisms are suitable for ship repair, conversion and new construction; and some of them are more appropriate to only one or two of those categories.

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What is Management?

-- and what is NOT management
of large projects?



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Analyses of many projects that have been contractual disasters, as well as lots of successful project management experience, has demonstrated the need to identify what constitutes Mis-management of shipyard projects. Do not equate poor management with Mis-management. Poor management means you won't quite get to your ultimate objectives, but at least you are going in the right direction. Mis-management is counter-productive, and sets the project off in the wrong direction. So, not only do we want to understand the objectives of appropriate project management, we want to consider what is Mis-management so that when we see it starting to occur, corrective action can be taken.

How do you measure how well your team has done in managing the project?

Cost ~~vs.~~ Budget?

Actual vs. ~~Planned~~ Schedule?



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These two comparisons are often mentioned in response to the question. But, as we will see shortly, they are definitely not the correct answer. Those comparisons do not measure how well your team has managed the project. Those comparisons only reflect on some happenstance or quasi-random outcome determined by factors other than project management.

First: What is NOT management of such projects?



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By the time you have enough data to consider how far over budget the project has gone, it is too late to start taking actions to control the budget. Of course, the reason why the budget has increased is because there were considerable change orders due to an understated initial definition of the project.

Also, by the time it becomes evident that the project completion will far exceed the contractually defined completion date, it is far too late to wrest control of the schedule. The unwarranted schedule extension may be due to considerable change orders, or may result from the contractor not having applied sufficient resources to the project from the outset, or both.

Recording Project History (Costs, Schedule) is Not Management:

**Management skills not needed for
that task if only recording history**



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Professionals in the maritime industry could, of course, easily record the actual costs and compare them to the budget; but such a comparison could also be made by a high school graduate with no experience in the maritime industry. The obviousness of that statement serves to emphasize that such a comparison does NOT require any managerial skills. The same is true for comparing actual to planned schedules.

Mis-Management:

**Making decisions that ultimately
will NOT affect the outcome**



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Mis-Management is very attractive and very seductive --- but not the least bit helpful. The attraction or seductiveness of it is that it appears that by one simple action, the developing problems will be solved. The one simple action might be to take no action, or to sign a supplementary contract with some entity that promises it will look after your interest to address the problem. When subjected to bright light, it usually seems too good to be true; and that's what it is: too good to be true.

Mis-Management Example:

“That problem will correct itself over the next few weeks.”

Never happens! Projects are not self-healing organisms



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If a problem has arisen, before it can be corrected or resolved, the reason for its development has to be understood. Was it lack of appropriate engineering or design? Was it lack of application of resources on a timely basis? Was it a poorly defined specification? Leaving a problem alone will not suddenly result in appropriate engineering, or additional resources, or re-defined specifications. Unless the underlying cause is corrected, it will remain a problem for the life of the project, if not the life of the ship. The cause has to be identified, and an appropriate mechanism has to be developed to overcome that causative factor.

False Management:

Hoping that an outcome will develop is not a substitution for planning and controls to make it come about



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Consider this example: I did not carry an umbrella with me today; therefore it will not rain. Of course this makes no sense, because my decision to not carry an umbrella will not influence the outcome. Yet often persons make what they think is a decision, but it really is just an expression of hope, hoping the outcome will match the so-called decision, but really not influencing the outcome in any way.

Another Mis-Management Example:

“They understand what we want; we don’t have to put it in writing.”

Even if they did understand, will they remember it that way? ... Why take such risks?



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This illustrates mis-management, because the displayed comment means that the person stating it recognizes there is a potential issue developing, yet nothing is being affirmatively done to avoid the development of the issue. So the party stating this is *hoping* that the outcome will be as expected, but is doing nothing to ensure it will definitely be as expected.

Management Example:

**Navigating a ship to a destination
beyond the horizon (old days,
use sextant at same time each
day)**



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This is a tried and true form of management, namely management of the course of the vessel. Consider the elements of this process and you will better understand what constitutes management of an on-going project, whether the project is to get a ship from one destination to another, or to get a ship constructed from a paper concept to tangible results.

Navigation Management:

At planned intervals, identify where ship is compared to where it was expected to be at that time; then alter course to ensure it gets to destination



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The elements of management that we see here are these: First, there is a plan; that is, the expected course. Second, there is planned interval at which data or conditions are going to be observed. Third, there is a definition of what data or conditions will be observed; the exact location of the vessel. Fourth, there is a comparison of the observed data or conditions with that which was planned. And fifth, when the observed conditions are at variance with the ones that were expected at that same time, resources are redirected to get the project properly heading toward its objective; in this case, the port of destination.

Fundamental Principle of Project Management:

Planned periodic review of where the project is, compared to where it was expected to be, and then, where needed, re-direction of resources to push it back onto track



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The five elements of project management, then, are the same as the elements of vessel navigation: (1) have a plan or expectation of how the project will be developing on a time line; (2) have a predefined time interval at which the progress of the project will be observed; (3) have a list of the forms of data that will be collected at each time of observation; (4) perform the observation and compare the actual status of the project with the planned status; (5) for each significant set of differences, identify and redirect the resources that are appropriate to getting the project on a course that will take it to a timely completion.

Five Parts of Project Management:

- **Plan of Action**
- **Timing of Observations**
- **Forms of Observations**
- **Perform the Observations**
- **Take Action/Corrections**



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Sometimes the projects which are being managed are as complex as rocket science, if not more complex; that is, the project itself may require the finest engineering minds and sophisticated technical analyses. But, the *process* of managing the highly technical, complex projects definitely does *not*, itself, require such sophisticated analyses. Rather, the project management process requires only the development and application of a methodical approach to keeping track of the numerous steps, milestones and events that occur within each of the functional areas of the project.

**What is the measure of how well
the contract is being managed?**

**How often data is assessed to
compare actual to planned status
of each functional area.**



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Thus, the measure of good project management is not simply waiting to record the outcome after the project is completed. Rather, the measure of good project management is *how often* the comparisons are made and decisions are made as to redirecting the use of resources when necessary to ensure the project is completed on a timely basis.

Apply that fundamental management principle in each functional area:

What is the status of each functional area compared to where we expected it to be at this time?



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Of course, simply trying to measure the status of a complex project, such as ship design, conversion or construction, is not a simple task on a global basis. So, we break it down into functional areas in order to have a defined plan or time-based objectives against which observed comparisons can be made. We will see that typically, for shipyard projects, there are about 15 - 20 appropriate functional areas.

Examples of Shipyard Project Functional Areas:

- **Drawing reviews by Owner**
- **Schedule updates by Contractor**
- **Change Orders**

(bigger list given later)



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These are just three of 15 - 20 functional areas that may be appropriate to ship conversion or construction. Each of these functional areas, while part of the overall project, can be separately planned, on a time-line basis, and can be separately measured or observed on a periodic basis. That is, we define the functional areas to be semi-independent functional obligations that have to be initially performed by one of the contracting parties, with each such functional area being susceptible to time-based targets and time-based measurements of completion. Regarding Drawing Reviews, the shipyard knows in advance the type and number of drawings it will have to produce in order to give direction to the production department; and it will also know when those drawings have to be produced to support the need for the information by the production department. This is typically described as the drawing schedule. So both the Contractor and the Owner can use the drawing schedule, and updates to it, as the plan of action against which their actual performance will be measurable.

Communications:

Every time a contractual obligation is fulfilled, there is a communication across the contract boundary.



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Usually, the communication is written; but sometimes it is oral. Examples of written communications that originate with the Contractor are updated schedules, megger readings, condition-found (open-and-inspect) reports, test results, drawings, certifications, and many more. Examples of written communications that originate with the Owner are comments pertaining to reviewed drawings, acceptance of test results, approval of a proposed agenda for sea trials, responses to condition-found reports, installation manuals for Owner-Furnished Equipment, and many more.

Key to Performance:

Every time one party fulfills a contractual obligation, the other party has a reciprocal obligation (which may be in a different form)



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In order to keep the project moving smoothly, both parties must recognize that they are not only having to perform their direct obligations, but they must timely respond to a communication received from the other party each time an obligation is fulfilled. Usually, the form of response is quite apparent, but sometimes the form of response is somewhat different. The important point here is that each party, upon receiving a communication from the other party, must ensure that it timely responds in order to help promote the smooth continuation of the project.

Reciprocal Obligation Example:

**Contractor sends detail drawings
for review**

**Owner returns comments
pertaining to the drawings**



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This is a fairly obvious form of response. During contract formation, the Owner's organization knew that it would want the opportunity to review those detail drawings before they were used by the Contractor's production department, and thus put into the contract the requirement that the Contractor provide such a review-and-comment period of time in the project's schedule. But this sets up a reciprocal obligation on the part of the Owner; namely, the review and comments have to be accomplished within the time allotted by per the contract. Note that the Contractor's Drawing Schedule, developed early in the project, identifies for both the Contractor and the Owner the target list of drawings that will be subject to this review process, and also sets forth the approximate schedule of when each drawing has to be completed. By the way, a thorough discourse on this subject of drawing reviews is contained in the SNAME publication, *Marine Technology*, Nov. 1991 in the paper: "Responsibilities Pertaining to Drawing Approvals During Ship Construction and Modification."

Another Reciprocal Obligation Example:

**Owner prepares Inspection-
Quality Deficiency Report**

**Contractor advises that Deficiency
has been rectified**



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Whenever the Contractor presents a completed aspect of the workscope for the Owner's inspection, the Owner will have to decide whether the finished work has been accomplished in accordance with the contractually-defined requirements and standards. In those instances when the Owner's staff is not satisfied with the accomplished work, the Owner's team presents an Inspection-Quality Deficiency report to the Contractor. Clearly, unlike the drawings to be reviewed, the number and timing of these Deficiency Reports is not knowable in advance. But it is essential that both parties maintain a list of these as the number of such reports grows so that everyone can later look back to see if the Deficiency has been corrected before delivery of the vessel to the Owner. Although the nature of each deficiency is not knowable in advance, and the timing of its observation is not predictable either, nevertheless these reports constitute another functional area that must be subjected to decisions as to redirecting the use of resources to ensure that each of those particular parts of the project is satisfactorily completed on a timely basis.

Fundamental Mechanism of Management:

Spreadsheets listing each contractual obligation of each party, separated into functional areas, with approximate dates



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A number of different functional areas have already been mentioned including drawing reviews, deficiency reports, updated schedules, megger readings, condition-found (open-and-inspect) reports, and test results, among others. The fundamental mechanism of dealing with each of these starts with a list. Sometimes the list is knowable in advance, such as for drawings and open-and-inspect reports. And sometimes the extent of the list *is not* knowable in advance, such as deficiency reports and change orders. Nevertheless, a list of them is essential so each party can keep track of the status of whether and when the other party performed its responsibility regarding each of them, and whether and when your party performed its responsibility regarding each one of them. But since multiple bits of information accompany each item on the list, the list becomes a spreadsheet having multiple columns to show key elements of the status of each entry on the spreadsheet.

Gather Data to Assess Status of Each Functional Area

**Compare to planned status for
same date**

Do it regularly



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The fundamental purpose of each spreadsheet – one per functional area – is to be able to quickly assess how well each party is doing regarding the *timely* performance of its obligations. The accomplishment of each obligation is followed, as discussed above, by a communication to the other party. By examining the spreadsheet for each functional area, you can see what was the target date for accomplishment of each element of that work— that is, the expected date of receipt of the appropriate communication — and what was the actual date. Especially you can see whether that element of work has not yet been completed or achieved by the target date. This is done for each expected communication and reciprocal communication which comes about when a contractual obligation is fulfilled by either party.

If slippage is developing, take action by redirecting available resources, or get supplemental resources



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When a review of the summary spreadsheet covering any particular functional area is performed frequently, you can see how well your own organization is doing in *timely* fulfilling its obligations (as well as seeing how well the other party is performing). If this review of the status of fulfillment of contractual obligations is done on a frequent periodic basis, it is not too late to take some corrective action. The corrective action is to either redeploy or reassign available resources, or add resources, so that any insufficiency in the timely fulfillment of your obligations is brought back to on-time performance.

Categories of Functional Areas:

- **Design**
- **Engineering**
- **Owner Activities**
- **Overviews**
- **Measurement**
- **Final Deliverables**
- **Other project-specific categories**



There are nearly two dozen functional areas that may arise during complex projects. In order to deal with them in a methodical fashion, we first break them into major categories of Design, Engineering, Owner Activities, Overviews, Measurement, Final Deliverables, and other Project-Specific categories. As we will see, no matter how technically complex the project may be, the development and updating of the spreadsheets in each functional area is fairly straight-forward, and certainly is not 'rocket science' even if the technical aspects of the project are akin to rocket science.

Design Category:

- **general arrangement drawings**
- **diagrams and schematics**
- **detailed structural design**
- **detailed piping design**
- **detailed electrical & mechanical design**
- **detailed HVAC design**
- **detailed outfitting design**



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The Design category can be further subdivided into several functional areas, the extent of which depends on the nature of the project. For newbuilding projects, for example, the individual spread sheets may focus on the completion of the drawings in each of the groups listed above. The spreadsheets for each of these will list the drawings that are necessary, the expected date of completion, and the actual date of completion, and possibly some secondary information. Thus a quick review of each spreadsheet leads to an understanding of which elements of the design process are on or behind schedule. It is important that the information be shared beyond the boundaries of the drawing office, with the project managers of *both* parties, so that any developing problems and schedule impacts can be studied and addressed as early as possible.

Engineering Category:

- weight and stability reports
- electrical load analyses
- finite element and structural fatigue analyses
- HVAC load analyses
- other project-specific engineering analyses & reports



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Similarly, the Engineering category can be further subdivided into several functional areas, the extent of which depends on the nature of the project. For newbuilding projects, for example, the individual spread sheets may focus on the calculations and assessments in each of the groups shown above. Again, the spreadsheets for each of these will list the engineering calculations and assessments that are necessary, including some key intermediate check points, and also list the expected date of completion of each, and the actual date of completion. Thus a quick review of each spreadsheet leads to an understanding of which elements of the engineering process are on or behind schedule. Of course, this is nothing new – engineering managers have been doing this for many years. But what is important is that the information be shared beyond the boundaries of the engineering office, with the project managers of *both* parties, so that any developing problems and schedule impacts can be studied and addressed as early as possible.

Owner Activities Category:

- purchase order reviews
- drawing reviews
- delivery control of owner-furnished information (OFI)
- delivery control for owner-furnished equipment (OFE)
- P.O.'s for secondary contracts
- change orders



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Clearly, the Owner's staff has just a many obligations to fulfill as does the Contractor, though they are not as extensive in terms of man-power. Each of the data-bases listed above merit spreadsheets that will enable the Owner's staff to establish targets for its performance of those obligations, and to keep track of whether it is fulfilling those obligations on a timely basis. Again, as with each of the spreadsheets, regardless of how technically challenging the work itself may be, the development and maintenance of an updated spreadsheet is relatively straight-forward. The power of these spreadsheets is remarkable, in that they enable the Owner's staff to better understand the importance of *actively and timely* fulfilling its obligations, and not just thinking that the Owner's staff is only a passive observer in the project.

Overviews Category:

- **schedule updating**
- **classification reviews & approvals**
- **regulatory authority reviews & approvals**
- **progress payment invoices**



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These spreadsheets, initiated by the Contractor but shared with the Owner's organization, assist both parties in understanding how the two parties perceive the overall status of the project at any given time, as reflected by comparisons of target dates to actual dates of the numerous activities in each spreadsheet. By frequent comparison of targeted dates to actual dates, any schedule slippage can be identified early, the two parties can work together to identify the underlying causes of such slippages, and together can then plan how to deal with such slippages without altering any contractual responsibilities or incurring any significant costs. Waiting too long to look for developing schedule slippages will almost certainly lead to otherwise unnecessary costs and contract damages.

Measurement Category:

- inspections
- condition (open/inspect) reports
- testing requirements
- trials agendas
- inspection deficiency reports
- warranty items



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Long in advance, the Owner knows which inspections will be performed by its team, which condition reports to expect, which tests it wants to witness, what it wants included in the trial agenda. These spreadsheets assist in identifying those obligations in a methodical fashion, and tracking its performance both in scope and timeliness. The spreadsheet for deficiency reports helps the Owner's staff assure that any noted deficiencies are resolved before vessel delivery. The warranty spreadsheet, although not developed until after vessel delivery, assists both parties in methodically keeping track of the status and form of resolution of each warranty item that develops during the contractually-defined warranty period.

Final Deliverables Category:

- as-built drawings
- trial data and results
- safety booklets
- trim, weight & stability
- other non-hardware deliverables
- spare parts
- equipment data-base
- manuals (paper & PDF)
- certifications



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In addition to delivering the vessel, the Contractor has to deliver many non-hardware items. Some of them are paper-only, but most of them are electronic deliverables as well. A thorough reading of the Contract Agreement and the Contract Specifications leads to these lists which, preferably, should be compiled and agreed-upon as deliverables as part of contract formation and execution. This way the Contractor can identify the non-hardware deliverables, and plan for their completion in a methodical manner. Similarly, the Owner's team can better appreciate what reviews it may have to accomplish, and also use these spreadsheets as a check-list to assure that the Owner receives all that has been bargained for and included in the Contract Price.

What do some of these spreadsheets contain?

Here are some column listings for example spreadsheets.

SHIP A&E
 THIS PRODUCTION SYMPOSIUM

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Many of the column headings for each spreadsheet will be different, but the key ones – expected dates and actual dates – are always the key columns. Even within a single type of spreadsheet, the column headings may change between different projects. But once your team has developed and used these spreadsheets for one project, it is easy to adapt them to another project. In order to demonstrate the variety of different column headings that are appropriate for the different spreadsheets, we can examine a few typical ones, as follows.

Drawing Reviews:

- drawing number
- drawing category
- drawing title
- date received
- reviewer's name
- date comments returned
- Is revision expected?



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The origin of this spreadsheet is, in fact, the Contractor's Drawing Schedule. Updates to that schedule should be carried into this Drawing Review spreadsheet. This one reflects three fundamental, related aspects of the detailed drawings. In terms of dates, it reflects the target date (taken from the Drawing Schedule), the actual date of drawing issue, and the date on which the Owner's team provided its comments pertaining to the drawing.

Benefit of Drawing Review Spreadsheet:

How well is the Contractor doing at getting the drawings completed? (If not well, why not?)

How well is Owner doing at timely reviews? (If not on time, add reviewer resources.)



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The 'power' of this spreadsheet is that, as long as the information in the spreadsheet is kept up to date, both parties can readily see how well they are doing at achieving their drawing-related objectives, and can also see how well the other party is doing at achieving its drawing-related objectives. When there is too much deviation from those objectives, the appropriate party can then take action – namely, the re-assignment of its personnel – to get back on target as soon as possible. The reason why I chose this example as the initial one is because, if drawings fall behind schedule, the entire project will unavoidably lag as well. So this spreadsheet is among the few that are absolutely mandatory for good project management.

Condition Reports

(open & inspect):

- **sequence number**
- **reference specification**
- **anticipated date**
- **actual date rec'd**
- **date of response**
- **Is follow-up action needed?**



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During ship repair and conversion, the Owner often requires, through the specifications, that the Contractor open and inspect numerous items of equipment or compartments, and report on the conditions found -- the findings of such inspections. Often, too, the Contractor is obligated to state its recommended fixes and the cost of doing so if adverse conditions are observed. The basis of this spreadsheet should be the specifications, themselves. By methodically going through the specifications, in advance of the actual work, the Owner's staff can make a list of all the condition reports they expect to receive, and by correlating that work with the shipyard's schedule, they can identify the approximate date by which the condition reports should be received from the Contractor.

Benefit of Condition Report Spreadsheet:

**Is Contractor on time for issuing
condition reports? (If not, why not?)**

**Is Owner giving timely responses? (If
not, why not?)**



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The first benefit of the Owner's staff developing this spreadsheet before the work commences is this. A review of the list may serve to indicate that one or more desired inspections with condition reports were inadvertently not included in the specifications. Thus, the Owner would be able to arrange for that open-and-inspect item, with condition report, to be added to the workscope before contract execution, or at least very early in the performance of the work, thereby minimizing the cost and schedule impacts. The second benefit of the spreadsheet, obtained by maintaining it up-to-date, is to see which condition reports were not timely provided by Contractor, so that corrective action can be taken before the inspections and fixes get too expensive or interfere with the project schedule.

O.F.E. Delivery Control:

- Item No.
- reference specification
- vendor name
- planned order date
- actual order date
- need date
- planned shipping date
- expected transit time
- expected arrival date
- actual shipping date
- actual arrival date
- delivery inspection date



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An understanding of the major problems with O.F.E. help focus on the objectives of the O.F.E. delivery control spread sheet. The major problems with O.F.E. are that it often arrives late , arrives in an incomplete or unexpected form, or doesn't arrive at all. The reason for these problems is that the personnel who actually order the bigger items of O.F.E. are not closely allied with the project, but only with the Owner's general organization. Thus, the sense of urgency disappears when the possibility of lower purchase cost arises. Also, the purchasing personnel sometimes perceive the specifications of the O.F.E. to be a wish list, as distinct from a hard and fast requirement. These are the major causes of problems with O.F.E. So everything must be done, especially the implementation of a delivery control spreadsheet, to minimize the problems associated with O.F.E.

Benefit of OFE Delivery Control Spreadsheet:

Has all the OFE been ordered? (If not, when will it be done?)

Will it arrive before the need date? (If not, Owner to advise Contractor to minimize impact.)

Did it arrive in installable condition?



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Unlike most other spreadsheets which track various aspects of the relationship between Owner and Contractor, this spreadsheet instead tracks the performance of the Owner's purchasing department and the vendors from whom equipment is ordered. If maintained up-to-date, at a glance, this spreadsheet will convey the status of each element of the O.F.E. as well as, if included, the O.F.I., information that the Owner has to deliver after the contract is signed, regarding the installation and testing of the O.F.E. The spreadsheet will convey whether each item of O.F.E. has been ordered, when it is supposed to be delivered, whether it is likely to be delivered on time, and confirm that it has been delivered. When problems with the timely ordering of it become evident from reviews of this spreadsheet, resources can be re-directed to minimize the impact that will be incurred as a consequence of those problems.

Change Orders:

- change number
- title of change
- reference specification
- change request date
- change proposal date
- change order or cancellation date
- engineering hours
- labor hours
- material costs
- subcontractor costs
- total cost of change
- contract extension days
- added weight
- v.c.g. and l.c.g. of added weight
- added electrical load
- new total contract price
- new delivery date



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This spreadsheet defines the status of the contract. It keeps track of the status of individual changes, as they progress from Change Requests made by the Owner, to Change Proposals returned by the Contactor, to either negotiated Change Orders, or cancellations of the Change Proposal. This way, there is minimal likelihood of confusion about the status of individual contract changes in terms of both cost and schedule impact. Also, then, the cumulative effect of the agreed-upon Changes is readily identified, as the new total contract price and the revised delivery date are observable from a review of this spreadsheet. The example of including weights and centers of gravity on this spreadsheet would apply only if the vessel is very weight-sensitive; but need not be included in all Change Order spreadsheets. The electrical load columns are similarly not needed if generating capacity is not near-critical.

Benefit of Change Order Spreadsheet:

By how many labor hours and percent has workscope grown?

By how much and percent has contract grown?

Why is Owner allowing so much contract growth?

Is it reasonable to expect Contractor to finish on time?

Have lightship weights and electric requirements grown?



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Consider that the first line of this spreadsheet indicates the corresponding numerical values of the basic contract . Then, by keeping track of the numerical values for each negotiated Change, the cumulative effect of the changes can be observed. For example, if the basic contract workscope included, say, 100,000 man-hours, and a number of Change Orders cumulatively added 20,000 additional man-hours, then it would be immediately obvious that the man-hour requirements had grown by 20%. The agreed-upon growth, if any, of the contract period, in workdays, would also be obvious, but need not be a direct correlation with the growth in man-hours. Similar observations can be made of the growth in subcontract and material costs

Addition to Change Order Spreadsheet:

Keep track of differences between proposed costs & impacts and accepted costs & impacts

For Contractor, it may become obvious that commitments are tending to exceed capabilities

For Owner, it may become apparent that on-time delivery is not likely, despite 'promises'



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Having observed the cumulative impact on man-hours and schedule of agreed-upon changes, each party is in a position to consider the potential impact of a Proposed Change. For example, if the man-hours have already increased by 20% but the schedule duration has increased by only 5%, it can be appreciated that the Contractor has to increase the average daily manning by 15%, with the peak manning increasing by perhaps 25% to 35%. Then, the reasonability of expecting the Contractor to offer to sell more man-hours without a commensurate increase in the contract duration can be assessed to understand how likely it is that the offered schedule commitment will be actually achieved. Also, if each party keeps track of the quantities associated with Change Proposals, and compares them to the corresponding values of the negotiated Change Orders, a trend may be observed as to how flexible or rigid the other party is in the negotiation process.

Testing Requirements:

Purpose is to identify all tests (components, sub-systems, systems, dock trials, sea trials)

Separate ones that will be witnessed by Classification or Regulatory Authority

Separate ones that will NOT be witnessed by third parties

Be sure that all of them are witnessed and satisfactory

Without spreadsheet, some might get missed



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Before the specifications for shipyard services are finalized, it is considered good practice to develop a list of the tests that are required by the draft specifications. This list is, of course, the beginning of a spreadsheet to track the accomplishment of the tests at the shipyard. But by preparing the list before finalizing the specifications, it becomes easier to see where there may be gaps or insufficiencies in the testing requirements of the draft specifications. Once the list is complete, the Owner uses it to keep track of the accomplishment and results of the tests, thereby increasing the likelihood that no tests will be overlooked. The shipyard should also be maintaining a comparable spreadsheet, tracking the status of completed tests, to help assure that they are done on a timely basis in order to minimize costs of corrections if the test results are not entirely satisfactory.

Inspection Deficiency Reports:

Purpose is to keep track of Contractor's response to each report

Does Contractor acknowledge it is a deficiency?

Has Contractor corrected it before vessel departure?

Without spreadsheet, some corrections might get overlooked



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As the Contractor completes each aspect of its work, it advises the Owner that the item is available for final inspection and approval. Sometimes, however, the Owner's staff determines that the work does not quite satisfy the contractual requirements, in which case an Inspection Deficiency Report or Quality Deficiency Report is given to the Contractor by the Owner. A spreadsheet pertaining to these IDR's or QDR's assists both parties in keeping track of the status of the necessary corrections. From the Owner's perspective, the spreadsheet helps assure that all of the corrections have been attended to before the ship departs the Contractor's facility. From the Contractor's perspective, the spreadsheet serves to identify the need for last-minute corrective work that was not previously scheduled. Further, by giving the corrective work a separate sub-account code, the Contractor can later see how many man-hours were expended on that work, thereby identifying potentially correctable areas of weakness in the production staff's procedures.

Conclusion - 1: Maintenance of the Spreadsheets is the heart of Contract Management.

Why? Because ...



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Please recall the earlier example of managing the navigation of a ship through the noon-time sextant determination of the actual position of the ship compared to where it was expected to be at that time. Based on that example, you are reminded of the fundamental principle of project management as this: A planned periodic review of where each functional area of the project is, compared to where it was expected to be at that same time, and then, where needed, re-direction of resources to push it back onto track. The mechanism to make those timely comparisons is through the advance construction of a series of spreadsheets to establish the targets for accomplishment of each specified work item, and to then keep track of how well both parties are doing at achieving those targets on a timely basis.

Conclusion - 2:

Unless your team regularly gathers and assesses data on how well each team is performing all of its functional requirements, you cannot know the 'health' of the project.



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If your team regularly updates and reviews the spreadsheets, you will know how well each team is doing at achieving those targets. If your team does not maintain the spreadsheets, you cannot reasonably identify at an early stage where the project is starting to experience troubles. Without maintaining the spreadsheets, the troubles will become noticeable only when they begin having such adverse consequences that the project cannot fully recover from them, leading to costly overruns and/or unexpected schedule delays. The avoidance of such cost and schedule impacts while achieving all of the intended workscope is the benefit of managing the shipyard project through the continuing use of these spreadsheets.



Mechanisms for Shipyard Project Management

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