THE USE OF OUTSIDE CONTRACTORS FOR PORT MAINTENANCE

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The use of outside contractors for some port maintenance tasks offers an attractive alternative to port managers seeking to improve their equipment availability and faced with a poorly staffed and equipped workshop and serious shortages of spare parts. The decision to adopt this approach, however, must be carefully evaluated to avoid subsequent problems and to realize the full benefits. Procurement arrangements must be well thought out, financed, cost-controlled and supervised for the results to be successful. Good management is the key.

This note considers a typical developing country port which owns and operates its facilities. For simplicity, it deals only with port equipment maintenance. Most ports already use some outside contractors for example, major electrical components such as alternators, motors, control units, communications equipment, and often floating craft are serviced, rebuilt or repaired by local outside contractors and usually the system works quite well, provided there is some degree of competition and outside services of acceptable quality are available.

Problems begin when decisions are made, for example, to rehabilitate 20 fork-lift trucks; to rebuild all diesel engines when required; or to overhaul and perhaps upgrade a group of quayside cranes. The port management has to decide how much work can reasonably be done satisfactorily "in-house" and at what point work should be given to outside contractors.

This note reviews the various factors that will determine the level of maintenance which a port can or should perform; how to evaluate the abilities of the local outside industries; how to make the decision to use them; the selection and control of the contractors; and the form of the contract.

MAKING THE EVALUATION

The factors which affect the decision are the volume and frequency of the work in question, the need for specialized skills and tools, the availability and quality of outside contractors (OMC), and cost. Most port managements would benefit enormously by using specialist consultants to help them make the decision, since many ports lack the in-house knowledge and background data to make the right decision.

Let's consider some of the factors in more detail:

Type of Maintenance

Preventive maintenance (PM); predictive maintenance (also PM); corrective maintenance; component rebuild and spare parts fabrication; rehabilitation/up-grading; and failure analysis are the principle components to be considered. Most ports will attempt to perform most of the PM and corrective work in-house and rely on OMCs for the rest. However, the world is tending towards component change out approaches to maintenance because down
time is minimized and, where appropriate, this could increase the use of OMCs for component servicing. For instance, in an East African port there would be little point in attempting to service electronic control equipment for RTGs in-house. The solution is to have, say, 20% change out units and have the failed units serviced by a local (or foreign) OMC.

**Volume/Frequency**

Work which is distinct from other port maintenance activities and which is performed infrequently should be considered for OMCs. Implicit in making this decision are accurate records of past equipment and workshop performance -- including costs. Such data are often very poorly maintained. It is also important to appreciate the number of units versus the number of different makes; for example, rebuilding 60 diesel engines each year of the same make will be a totally different task from rebuilding the same number from five different manufacturers. The former could be done in-house, while the latter would be more suitable for OMCs.

**Availability of Specialized Skills and Tools**

When deciding to perform tasks in-house, it is very important that the port understands exactly what will be required to do the task properly and at the right cost. But it is equally important that the option of using an OMC is based on his capabilities and performance records. If there is no OMC available, the port may have to put together a unit to do the work or perhaps encourage an OMC to take on the task through promises of future work, financial assistance, the provision of facilities or other incentives. If the in-house route is essential, then the following steps are necessary:

- determining the facilities, equipment, tools and materials required;
- planning the shop layout;
- planning the work procedures and sequences;
- developing a work schedule with operations;
- determining the necessary spare parts inventory, the in-process inventory and component change outs;
- estimating the skilled manpower required and the probable source (including expatriate technicians);
- developing a staff training program and training materials; and
- determining the overall investment and annual recurrent costs.

**Cost**

If the OMC has plenty of similar work to that required by the port, then he should be able to provide adequate service at the right price that is, considerably cheaper than the port could do it in-house. There is no easy answer; the port must consider each option carefully. The shortage of foreign exchange is a major problem. The port has very little, the OMC possibly none at all. The best approach is for the port to advance to the OMC the foreign exchange specified as necessary in his bid (and that was agreed by the port at evaluation). An alternative is for the port to provide the OMC with the imported spares that he needs, but this system is dangerous since delays by the port will result in substantial claims by the OMC for delay. The foreign exchange requirements are the same whether the work is performed in-house or by an OMC.

In any event, it is vitally important that the selected option will assure performance of the work to satisfactory standards. Reduction of the quality of the work is not an acceptable alternative even if it appears to save money. In many ports it is very difficult to estimate the overhead costs accurately, and thus it is not easy to compare the OMC’s prices with those of doing the work in-house. Once again, the use of consultants will help to overcome this difficulty.

**MAKING THE DECISION**

Port management must ensure that each decision is based on a thorough systematic analysis. Recently a decision to rehabilitate a fleet of 8 ton FLTs in a developing country had to be abandoned after the expenditure of a very large sum on replacement parts and on port workshop manpower because the decision had not been based on cost data, there had been no discussion with the workshop staff concerning the procedures and the task was entrusted to a
qualified but very inexperienced young engineer who received no guidance from his managers. In fact the fleet was virtually destroyed by this decision.

The Bank publication, "The Management of Port Equipment Maintenance" (INU No. 57), and particularly Chapter 7, provides typical evaluation forms to simplify the in-house versus the OMC option. The information required by these evaluation forms is summarized in the Annex. Normally the financial indicators, particularly the return on investment, will form the basis for the port's decision. The forms also include a list of required approvals at various levels indicating who, in the organization, has the authority to approve such decisions.

**SELECTION AND CONTROL OF THE OMC**

Once a decision to use an OMC has been made, it is the responsibility of the port's management to ensure that the work is done properly, in a timely manner and economically. A very clear definition of the work to be performed has to be made. Both sides must understand what the work consists of, where it is to be performed, the quantity of work, the program and completion times, performance standards and testing, the anticipated cash flow and foreign exchange allocations and the probable basis for claims.

**OMC selection.** Since the contract award is normally based on a competitive bidding process, the first step is to select a list of OMCs and to carry out prequalification procedures.

**Competition.** Long-term OMC contracts should be put out for bids periodically, if possible, so the OMC knows that he may lose the contract if his performance is not cost-effective.

**Control of the OMC.** Often this is the most difficult task. Unless the port is able to manage and control the contractor effectively the whole process can result in major cost overruns through claims, delays and losses of equipment. In many instances it is difficult for the port to find appropriate engineering and contract management staff to supervise the OMC adequately, and the use of consultants should be considered.

**THE CONTRACT**

The terms and administration of a maintenance contract can be very complex. Thus only persons familiar with maintenance contracts should draft both the bidding documents and the form of contract. There is considerable choice in the possible terms of such contracts but there are four basic types.

**Lump Sum.** The OMC is paid a predetermined amount for his services related to a clearly defined scope of work. This system should only be used when the scope of work is very clear, or all bidders will tend to inflate their prices to cover unforeseen tasks.

**Unit Price.** This type of contract has some advantages for a port which has fleets of various kinds of mobile and semi-fixed mechanical equipment or floating craft, is not certain when these various units will require maintenance, and thus is uncertain about the volume of work to be performed. This type of contract may put a difficult constraint on the port to avoid overpayment.

**Time and Materials.** This is perhaps the most commonly used form of contract. The OMC is paid for actual man and equipment hours at agreed contractual rates. Clearly, this type of contract requires very skilled and daily supervision by experienced port staff or by a consultant acting for the port to keep costs under control.

**Cost Plus.** In this type of contract the port reimburses the OMC for his actual costs plus a fee (profit). The advantages are that the contractor is better protected from uncertainties and the cost to the port should be less. But, like the system above, it requires very careful supervision by the port to be effective. For this reason, cost plus should perhaps only be used for the largest maintenance tasks such as the rehabilitation of container quayside cranes, a fleet of 60 FLTs, a group of 200 chassis, etc.

There are other possible alternatives designed to suit special circumstances or conditions. It is interesting to note that in a recent decision to rehabilitate and up-grade the rail mounted quayside container cranes in the port of

Kingston, Jamaica, the port authority, realizing the complexity, employed specialist consultants to help them identify the probable costs and scope of work, to pre-qualify contractors, to prepare the bidding documents and to assist in the evaluation of the bids. Since the work would only interest local contractors working in joint ventures with foreign firms, the consultants used video photography accompanied by a sound track very extensively in describing the scope of work in the prequalification and bidding documents. The sound track was made up using both the consultants' technical staff and the port authorities' maintenance technicians so that even the history of modifications could be presented. In this way the scope of the task was presented in such detail that much more accurate and lower priced bids could be obtained and the risk of subsequent surprises and claims greatly reduced.

CONCLUSIONS

The use of OMCs can be an enormous help to port management in keeping their equipment operational. The system is widely used in developed countries with great success, but OMCs should not be seen by less developed country port management as the answer to everything it may even be more difficult to supervise and control an OMC than to do the same task in-house. Well qualified, experienced staff are needed for the supervision and contract management role. However, the port can supplement its own staff resources by the use of consultants in a very cost effective manner. In several current Bank projects the port is being encouraged to start to use OMCs where feasible. Dar es Salaam and the ports of Colombia are examples.

TO LEARN MORE


World Bank, Africa Region. "GHANA: Ports Rehabilitation Project." This interesting and relatively successful project includes a host of maintenance and rehabilitation by OMCs. Talk to Luis Pereira, AF4IN, for details.

World Bank, EMENA Region, "MOROCCO: Ports Sector Project." In Casablanca, ODEP carries out some equipment maintenance "in-house" and uses OMCs for the rest very successfully. For more information call Jean-Francois Maquet, EMTIN.

ANNEX

The information required to evaluate the decision on use of an OMC is:

(a) The work definition in considerable detail, including the life of the task.

(b) The technical and labor skills required -- numbers at each grade, special skills, hours to be employed per unit, rates of pay anticipated.

(c) The availability of the manpower needed. How can the appropriate skills be provided -- if at all.

(d) The need for special tools or equipment. This may apply to the OMC as much as to the port. It could also imply the need for foreign exchange for procurement.

(e) Quality considerations. There may well be some aspect of the maintenance task which is very difficult to perform and yet which is critical to the operating function -- can it be achieved and with what degree of confidence.

(f) Costs. Annual costs and unit costs are based on: manpower costs, material costs, tools/equipment investment and

running costs, facility and other over-head costs, taxes and any other costs which will affect the decision.

(g) Mobilization costs for setting up a new maintenance task.

(h) Staff training and training materials, specialized courses -- perhaps overseas.

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