Evaluate Machinery Using Life Cycle Costing Tools II[1]

Life cycle costing (LCC) is a promising evaluation tool that makes it possible to compare alternatives by quantifying the long-term outlook. In a previous column we stated that in petrochemical – down-, mid-or upstream – operations, for example, maintenance and downtime costs often exceed the initial equipment cost. We outlined twelve basic steps that could lead to a successful life cycle cost analysis. One of these steps was to calculate the final LCC of a particular piece of equipment, using a cost model based on repair costs. In most cases, a model should allow to perform a sensitivity analysis. A sensitivity analysis consists of evaluating the results displayed by a model – mathematical or other – upon changing one or more input variables.

A sensitivity analysis will help us to look for the benefits that could be derived from attempting to reduce repair costs. It allows us to compare, for example, purchasing a more expensive and hence more reliable pump or making repairs more efficient and consequently less costly.

Many reliability professionals are talking about LCC. Frequently, that is where the subject remains - in the talking phase. A few basic and simple administrative procedures can help to familiarize plant personnel with LCC concepts. However, to implement LCC practices, a company policy must be established.

This policy would apply to new or replacement projects, particularly where major un-spared equipment such as compressors are being purchased and installed.

All phases of project development, from conception to startup, should be included in this policy of minimizing life cycle costs. However, the implementation of LCC will add additional steps and reviews in the project development process, as shown in Figure 1. Audits of the LCC procedures should be conducted for projects 6 months after closing. This should be done during the regular project audits. Checklists would assist project team members in conducting these audits. Their main purpose is to assure that the overall LCC policy is being adhered to in the project development process.

Set up 5-year audits as well. This is a good interval to re-evaluate life cycle costs, and determine the break-even capital. Audit against the LCC assessment in the project work scope document and against benchmark data. Although the audit is conducted after 5 years, the maintenance and operating average annual costs will be extended to a 15-year or any other period specific to your installation. This way we may arrive at a standard equipment life and we can make the final evaluation on that basis. Lessons learnt will be incorporated into continuous improvement of the LCC Policy. Ultimate, a well established LCC Policy will contribute to the acquisition of more suitable and reliable equipment.

[1] Look for Part I in a previous column

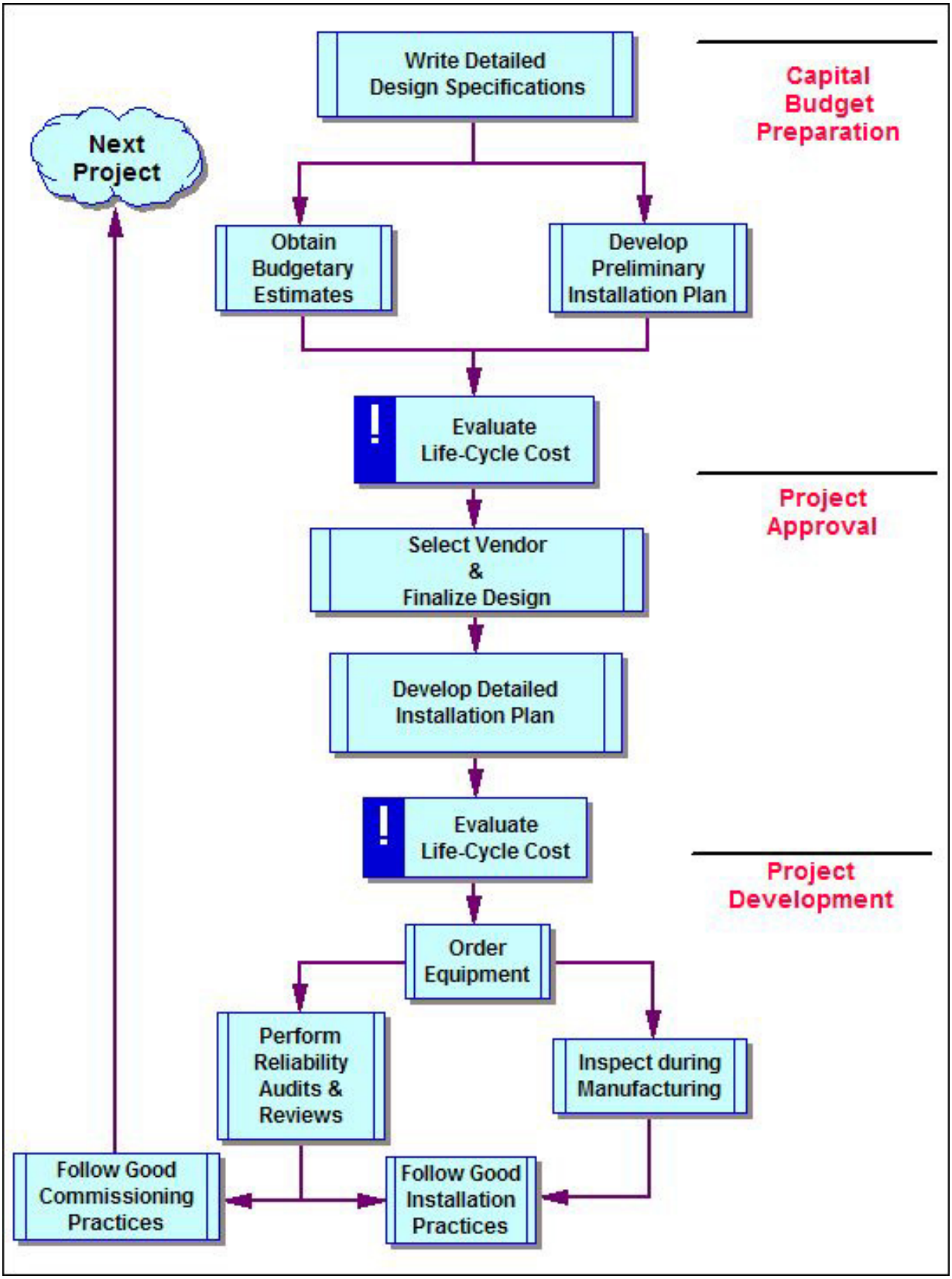

Figure 1. LCC policy implementation.

Table 1. SYMBOLS

C_G	= Average repair cost, $
C_{PV}	= Present value of costs, $
C_Y	= Annual repair costs, $
i	= Current interest rate, dimensionless (decimal form)
MR&O	= Maintenance, Repair & Overhaul
MTBR	= Mean time between repairs, months
MTTR	= Mean time to repair, days

References

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