

MODERNIZING AND USING THE PROJECT CONTROL DOCUMENT

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INTRODUCTION

The authors have produced a paper, dear to the heart of a consulting engineer, and one which must be truly germane, to project developments by full service contractors now engaged in solid waste resource recovery projects. All who have waded through the tasks of feasibility studies, preliminary and final designs, and the preparation of draft contract documents, input to bond prospectuses, bid preparations and contract documents will benefit from this paper.

NARRATIVE

Characteristics of the municipal solid waste stream are often presented by those issuing proposal documents in an incomplete state, to say the least. Because the determination of refuse heating value is the key to boiler design and to energy production, the section on characteristics, and all that it implies toward the definition of successful project factors such as sources, quantities, and quality, could well be the subject of a complete paper.

The scope of available disposal methods could be quite comprehensive, covering projects of large magnitude. Alternatives providing "the differing methods that might be used to meet the area's waste management objectives" are identified as a method of screening to a limited number of feasible ways for further development and final selection. The authors point out the importance of having access to the reasons for acceptance or rejection of a process in a public environment. It is easy to find agreement with the authors concerning this matter.

The facility section describing siting, access, geotechnical requirements, public utilities availability, zoning, development and cost, is indeed an important design document. Facility procurement documents will draw directly from this section.

Residuals management alternatives, presently the center of intensive investigation and decision-making, would be examined in the disposal section of the narrative. As one looks at the national scene and the development of residuals management and disposal for wastewater, water, and solid waste projects, the importance and pressures accruing to this section are made very clear.

The sections of the narrative covering public participation, product sales, regulatory and planning, are proposed to identify public preferences, energy and recycled products sales, and legal and regulatory constraints. The successful implementation of each of the

tasks in these sections is essential and sometimes crucial to the real project.

The business and financial plan sections merge early in the project development with project economics to resolve financing constraints, and risks on the part of the Client and the Contractor in full service projects. The input from the project economics section is utilized to determine economic feasibility.

In the opinion of this discussor, the presentation of the narrative is incisive, although restrained. The authors have revealed the worth of the narrative concisely, whereas the subject matter might require very extensive coverage for a fuller appreciation.

TECHNICAL MODELS

The discussion concerning technical models is presented well and we have not examined the boiler heat balance nor the models covering air pollution controls or stack emissions on a critical basis. The assumptions indicated for plant availability and the output data in the tables appear well founded and reasonable. The level of detailed coverage in the tables indicates that the analyses are well formulated.

ECONOMIC AND FINANCIAL MODELS

The construction of Table 5, identified as a representative pro-forma accrual statement, is similar in many respects to statements with which we are familiar. It is appropriate to consider it as representative and not to search out specific items for extended discussion. We wish, however, to inform the authors that for well-known stoker systems and refuse burning boilers, with proven operating time, reasonable estimates for maintenance parts and supply costs can be made. A recurring issue in the matter of providing for the maintenance parts and supplies is: Just how much money must be set aside in the initial years?

CONCLUSION

The paper has real value to those interested and involved in the resource recovery industry. As we have stated herein, the authors have approached this work without dogmatism, but have invited questions and discussions which should result in benefits to engineers, planners, and financial persons involved in this industry.

Discussion by

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The authors are actually referring to two documents, (a) the narrative and (b) the computer model, which together provide the project control document. In effect, what the authors appear to say is that decision-makers involved in project development should manage their project utilizing one control document, one format, from beginning to end. The authors, in their management control document, provide a format which can remain constant throughout the project development.

The computer model, which evidently consists of many tables with initially quite a bit of assumed input, has as its key output Table 5, a screening model, which allows the reader to quickly analyze the financial status of the project and, because the format is consistent, the reader could see the effect of various inputs on the net revenues of the project on a year-to-year basis. The concern one has in this approach is how good are the inputs and, in particular, assumptions on performance, capacity factor, and operating expenses such as labor and materials. The positive side is that the table itemizes most of the significant revenues and expenses which the project faces and provides the opportunity for the reader to manipulate any or several components to see the sensitivity of this to the final net revenue.

The authors suggestions for sections required in the narrative portion of the document are quite appropriate and appear to cover all the issues which decisionmakers need to address early in their project.

The authors then state that the narrative section can be expressed as a mathematical model. However, how this is done and how these subjective topics are all quantified and assessed objectively is not explained by the authors. I would be very interested in seeing and understanding how such a model is created and used, especially by political leaders whose priorities on these narrative topics can change based on outside influences.

The concept of having one document remaining constant in format but continually changing throughout the project development is a very good concept and would provide for a similar point of reference for decisionmakers throughout the project development, which in most cases for a waste-to-energy plant would take anywhere from 7 to 10 years.

In reviewing the authors narrative sections and the computer model sections, I do not find any provisions for a project schedule, especially a schedule which will provide key points of decisionmaking activity throughout the project and would identify what inputs should

be available to decisionmakers at that time. It was also interesting to note in the authors discussions of the proforma balance sheet summary they suggested an acceptable ratio of net revenue to net debt services (coverage) should be 1.5 or higher during the early development stages of the project and that as the project develops and firmer information comes in, it would be anticipated a ratio of 1.2 would be acceptable. If a project is utilizing the management document as proposed herein and especially the computer model with all its involved tables it should be expected that the first cut information generated would be based on conservative numbers input as assumed data (revenues on the low side, expenses on the high side) to then compound this conservative nature with the requirement for a 1.5 coverage seems to doom projects to failure before they even get started. One would expect that conservative numbers would be assumed for early data with coverage, one of the prime decisionmaking indices in the project, being maintained as a constant ratio throughout the project. It is interesting to note that the example shown as Table 5 prepared by the authors does not make even the required 1.2 coverage in the first three years of the project.

In summary, the concept of utilizing a master project control document which is constantly updated to reflect the most current subjective and objective inputs to the project is quite useful. It provides all involved in the project with a constant reference point in assessing project status. The main challenge is to insure that assumed data input to the project control document during the earlier years of project development are taken from recent data generated by existing operating facilities similar to that proposed for this project.

AUTHORS' REPLY

The authors are pleased that both reviewers believe the paper will be an important contribution to the field. Our experience has been that the MPCD helps keep a project "on-track" by ensuring that secrets are min-

imized and all relevant aspects are available to decision-makers.

The authors, like Mr. Reardon, are fully aware that there are well known stoker systems and refuse burning boilers upon which operability and maintenance estimates can be based. The data in the public domain, however, is either for the early operating years (not typical of the long-run) or for designs and operating conditions that are no longer used. As a result, we believe that our statement concerning the softness of maintenance data is true. Until a project reaches the point where proprietary plant records can be penetrated, good maintenance costs estimates are difficult to make. Our experience indicates that any maintenance estimates should be rounded-up; with luck, the surprises will then be pleasant.

Mr. Eppich rightly points out that some subjective criteria are difficult to quantify. Our experience is that we can usually turn criteria such as "failure to achieve 80% availability results in a penalty" into a quantitative expression that automatically deducts the penalty whenever the design availability falls below 80%. Any expression that restricts technical performance or affects money can be similarly converted. Even public policy statements such as "recycle 25% of the waste" can be incorporated by estimating the impact on waste composition and plant capacity and performance.

Mr. Eppich also points out that we did not highlight schedule. This was inadvertent. Schedule is an important aspect of the implementation plan portion of the Project Control Document.

Finally, with respect to Mr. Eppich's comment on coverage, we meant what we said: at the screening level, coverages should be higher because our experience indicates that capital and financing costs tend to be understated and plant performance overstated. Once decent estimates and process engineering has been completed, the ratio can be reduced. The example shown in Table 5 is representative of the lowest coverage that should be considered. Before the paper was shortened, we explained that the low coverages during the early years could be overcome by adjusting the bond repayment schedule. We apologize for any confusion our zealous editing caused.