



**Design Value Management,
Constructibility Dialogos, and Risk
Assessment**

**Gerencia de Diseño Basada en Valor,
Diálogos de Constructibilidad y
Evaluación de Riesgo**

PB/MWH/Social Enterprise Consulting

14 de septiembre de 2005

Contrato No. 156747

Resumen Ejecutivo

***Design Value Management,
Constructability Dialogos and Risk
Assessment***

Third Lane Locks Project

22ND August to 26th August 2005



14 September 2005



EXECUTIVE SUMMARY

Five days of value management, constructability dialogos and risk assessment workshops were held at Panama Canal Authority headquarters to consider the Third Lane Locks project. To ensure that all of the stakeholders' needs were accounted for in the design, representatives of various stakeholders were present. The representatives were carefully selected as the success of the workshops is dependent upon the input of participants, as too is the level of commitment to the recommendations emanating from the workshops.

A strategic diagnosis was carried out with the senior management of the ACP prior to the workshops in which the limits of the Project and of the workshops were defined and a S.W.O.T. analysis (strengths, weaknesses, opportunities and threats) in relation to the project to date was evaluated. From these, critical issues were identified. Topics to be covered by workshop presenters were also identified. These topics, together with the briefing document circulated to the participants prior to the start of the workshops, represent the baseline information given to the participants to enable their constructive input. Draft project objectives, workshop objectives and project scope were also formulated. During the strategic diagnosis the overarching objective for the project was identified as being:

To increase capacity to meet growing cargo carrying demand along major international trade routes

The information stages of the workshops comprised, in each case, the presentations by identified participants, a structured question and answer session and a functional analysis section, which identified eight categories for each workshop to be idea generated.

The idea generation for the design value management workshop produced 267 ideas which ultimately were converted into a series of working lists. This included 48 design notations which represented stakeholders' needs and were, by consensus, to be incorporated into the design. In addition to the design notations a number of items were identified as being of possible benefit but which required further development or investigation. These were developed into a specific action plan. Importantly, the major design notations and action plan items identified in the value management workshop were estimated to reduce the project cost by at least \$720 million. Details of these estimated cost reductions are given on page 21.

Within the value management workshop several of the visiting experts suggested alternative design concepts from their own knowledge and experience which was felt may add further value to the Project, either through reducing the cost of its construction and/or operation and maintenance, or by improving its performance and/or maintainability. Dr Gabriel Fernandez, specialist in geotechnical engineering and Professor of Civil Engineering at the University of Illinois, presented sketches explaining the suggested change in the lock wall design, the cost savings from which are included in the table on page 21, and Jens Korsgaard of Han Padron presented an alternative valve for connection of the water saving basins to the lock chambers which would have no moving parts and so may simplify maintenance, and also would reduce the number of conduits required. Copies of all these presentations are given in Appendix 3.

One idea of particular interest was presented by the experts from Bundesanstalt für Wasserbau of Germany, where water saving basins are used with locks. All of these use an alternative system of filling and emptying of the lock chambers from the bottom, using an underfloor chamber rather than longitudinal and transverse conduits as found in the existing Panama Canal locks. This avoids the problem of excessive hawser forces being generated and operates equally well with or without the water saving basins in use, and was commended for further study.

For the constructability “dialogos” a total of 348 ideas were generated. These ideas were divided into three categories. The first were the action planning items which indicated actions to be undertaken by ACP prior to award of contract. The second category of ideas were those that had to be addressed by the contractor when putting forward a bid/proposal, while the third category of ideas related to those items that must be complied with by the contractor by way of the contract.

Many hundreds of ideas generated in the constructability session related specifically to actual constructability issues (if the session was on constructability, wouldn't that have to be the case?). These items had been taken out of the consideration for constructability strategy at this point in time of the project as they related to ideas which would be at the option of the contractor. Although these ideas did not fall into the categories indicated above and were considered beyond the reach of the ACP to require of the contractor, they were considered, by consensus, to be of potential benefit to the Project and should at least not be precluded by the final design, specification or contractual terms. Because of this it is recommended to consider passing the constructability part of this report (together with relevant appendices) over to interested contractors as part of the supporting material to the tender documents. Some of the issues might help them put together their thoughts in the first place, particularly as they are drawn from the aggregated experience and wisdom of the ACP and of many experts from around the world (can you mention the countries they came from?).

A preliminary risk assessment was undertaken. Eight risk categories were identified by the participants. These included political; operational; labour; site conditions; administration; construction; design and financial factors. Three hundred and thirty-six specific risks were identified in relation to these categories. For the major risks indicated in the report it is considered necessary to develop a proactive action plan. This will need to be formulated as a post workshop activity. A draft, indicative-only action plan has been included in this report.

Finally, a series of recommendations have come from the facilitator based on his extensive experience running workshops worldwide on similar types of projects. The first recommendation to be considered is for value engineering studies to be carried out as soon as applicable for other elements of the expansion project, for example the access channels (for which this could be done now). The second recommendation relates to the successful implementation of the many excellent ideas emanating from the workshops. To this end it is suggested that a nodal body is identified within the ACP to coordinate the identified actions and outcomes of the parties articulated in the action plans for design and constructability. The final recommendation, also coming from the facilitator is based on the degree of discussion during the risk assessment session. This recommendation is that there be an intensive 2-day workshop to develop a strategy for the Referendum, using the same collaborative decision-making principles.