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AGENDA

Solutia/Gateway Workshop
December 22, 1997

1. Introduction of all Team Members and Roles
2. The Process
3. Open Issues
4. Phase 1- Information phase
5. Phase 2-Speculative or creative phase
6. Phase 3-Evaluation or analytical phase
7. Phase 4-Investigative phase
8. Recommendations

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PHASE 1 – INFORMATION PHASE

- Goals of the Workshop
 - Solutia, Gateway, Contracting, Engineering, Operator
 - Showcase operation
 - Cost savings project, life cycle costs
 - Schedule is critical
- Collect all facts, opinions, and data. Ask:
 - What are assumptions?
 - Which may be masquerading as knowledge?
 - Do not begin suggestion of alternatives.
 - What is the history of this project?
- Questions & Answer Session
 - Design loads
 - Design constraints
 - Use of existing facilities
 - State regulatory input (i.e., MDNR)
 - Federal regulatory input (i.e., FEMA)
 - Local regulatory input (i.e., city, fire marshal, etc.)
 - Acceptable equipment
 - Detailed cost estimate
 - Environmental, survey, Soils report
 - Alternatives evaluated in design process
 - Equipment designed around
 - Power requirements
 - How will various processes be controlled?
 - Capital versus maintenance cost
 - Any DBO review constraints?
- Review of Gateway Design Basis
 - How was design basis developed?
 - What are the constraints?
 - IEPA
 - Actual data
 - Any DBO review constraints?
- Financial and Legal constraints

PHASE 2 – SPECULATIVE OR CREATIVE PHASE (BRAINSTORMING)

- Site Selection
 - environmental
 - utilities and infrastructure
 - operations
 - financial, legal
 - future constraints
- Building
 - Criteria for design
- Process
 - Process equipment
 - Piping
 - redundant systems
 - water treatment
 - oil storage
 - gas supply reservation
 - saturated vs. superheated steam
- Create extensive list of alternatives. Ways to perform essential functions found during information gathering.
- Key-delay any critical judgments.
- Thought provoking questions:
 - What is the input?
 - What is the output?
 - What should go in between?
 - Could this be done automatically?
 - Is all of the known information available to me?
 - What emotions or attitudes are we dealing with?
 - Are specifications tight or loose?
 - Could this be done somewhere else?
 - What would happen if this weren't done at all?
 - Could this be done mechanically? Electrically? By hand?
 - Could you re-orient present structures to improve them?
 - What other facilities have this kind of problem?
 - How much of this is a result of custom? Tradition? Opinion?
 - What else could this be made to do?

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- How could this be done piecemeal? Phased over time?
 - How else could the basic function be accomplished?
 - Where is our greatest economic effort expended?
 - Why hasn't anyone done this before?
 - How would postponement of this objective affect the project?
 - Can better use be made of existing facilities?
 - Are the "ground rules" real or imaginary?
 - What can be combined?
 - What should be divided?
 - Why are the present limits adopted?
 - How can this be made more compact?
 - What other layout might be better?
 - Can it be made safer?
 - What other materials would do this job?
 - If all specifications could be forgotten, how else could the basic function be accomplished?
 - Could these means be made to meet specifications?
- Record ideas immediately.
 - No such thing as foolish speculation.
 - Persistent how and why questions.

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PHASE 3 – EVALUATION OR ANALYTICAL PHASE

- Consider feasibility of speculative or creative phase items.
- Look positively for ways to make idea work, rather than critically for an excuse for rejection.
- Preliminary cost estimate may be required to narrow down the field.
- Develop list of special requirements, if any, for items (special labor skills, high/low O&M, repair costs, labor market constraints).
- Screening criteria:
 - Are the performance requirements met?
 - Does the alternative meet the quality requirements?
 - Are the reliability requirements met?
 - Are the original reliability requirements unreasonably high?
 - Will the system accept the alternative without excessive redesign in other areas?
 - Is there an improvement, or at least no loss, in the maintainability of the system?
- Identify advantages and disadvantages.
- Discuss relative merits.
- Assign numerical hierarchical rating.
- May need to return to previous phase for additional development.
- Select best ideas for further investigation.

PHASE 4 – INVESTIGATION PHASE

- Investigate most feasible alternatives further.
- Develop implementation costs:
 - Redesign
 - Discard, remove, modify existing facilities
 - Collateral advantages to the owner, i.e., by product value
 - Confirm assumed costs
 - Develop O&M costs
 - Contact manufacturers
 - Document costs
 - Life cycle costs
- Develop factors other than cost:
 - Improved performance
 - Improved reliability
 - Improved flexibility
- Recommendations/Approach
- DBO Workshop Report
- Schedule of Implementation (Design & Construction)

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