SUPPORTING DOCUMENT		1. Total Pages 45
2. Title Low-Level Waste Vittrification Plant Project Contracting Strategy Decision Analysis Report	3. Number WHC-SD-W378-SP-001	4. Rev No. 0
5. Key Words Major systems acquisition (MSA) contracting strategies; contracting strategy decision analysis report, LLWVP; competitive contracting strategy, MSA; contracting/privatization strategy decision analysis	6. Author Name: P. Felise/J. D. Phillips <i>Paul Felise</i> <i>John D. Phillips</i> 10/14/94 Signature Organization/Charge Code 7F730/D4E71	
7. Abstract <i>CONFIDENTIAL</i> <i>J. Burkland 10/14/94</i> This report provides a decision analysis process description for selecting the best contracting strategy (including privatization) for major systems acquisition (i.e., for the Low-Level Waste Vittrification Plant Project).		
8. PURPOSE AND USE OF DOCUMENT - This document was prepared for use within the U.S. Department of Energy and its contractors. It is to be used only to perform, direct, or integrate work under U.S. Department of Energy contracts. This document is not approved for public release until reviewed. PATENT STATUS - This document copy, since it is transmitted in advance of patent clearance, is made available in confidence solely for use in performance of work under contracts with the U.S. Department of Energy. This document is not to be published nor its contents otherwise disseminated or used for purposes other than specified above before patent approval for such release or use has been secured, upon request, from the Patent Counsel, U.S. Department of Energy Field Office, Richland, WA. DISCLAIMER - This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency thereof, nor any of their employees, nor any of their contractors, subcontractors or their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or any third party's use or the results of such use of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof or its contractors or subcontractors. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.		10. RELEASE STAMP <div style="border: 1px solid black; padding: 5px; text-align: center;">OFFICIAL RELEASE BY WFO DATE OCT 17 1994 35 STATION 31</div>
9. Impact Level Q		

DISCLAIMER

This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.

DISCLAIMER

This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency Thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.

DISCLAIMER

Portions of this document may be illegible in electronic image products. Images are produced from the best available original document.

RELEASE AUTHORIZATION

Document Number: WHC-SD-W378-SP-001, Rev. 0

Document Title: Low-Level Waste Vitrification Plant (~~LLWP~~) Project
Contracting Strategy Decision Analysis Report

Release Date: October 14, 1994

* * * * *

This document was reviewed following the
procedures described in WHC-CM-3-4 and is:

APPROVED FOR PUBLIC RELEASE

* * * * *

WHC Information Release Administration Specialist:

Vicky Birkland
(Signature)

Vicky Birkland

10/14/94
(Date)

TRADEMARK DISCLAIMER. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof or its contractors or subcontractors.

This report has been reproduced from the best available copy. Available in paper copy and microfiche. Printed in the United States of America. Available to the U.S. Department of Energy and its contractors from

U.S. Department of Energy
Office of Scientific and Technical Information (OSTI)
P.O. Box 62
Oak Ridge, TN 37831
Telephone: (615) 576-8401

Available to the public from the U.S. Department of Commerce
National Technical Information Service (NTIS)
5285 Port Royal Road
Springfield, VA 22161
(703) 487-4650

MASTER

EXECUTIVE SUMMARY

Ten basic contracting strategies were developed after a review of past strategies that had been used at the Hanford Site, other U.S. Department of Energy (DOE) sites, other U.S. government agencies, and in the private sector. As applicable to the Low-Level Waste Vitrification Plant (LLWVP) Project, each strategy was described and depicted in a schedule format to assess compatibility with the *Hanford Federal Facility Agreement and Consent Order*, also known as the Tri-Party Agreement (Ecology et al. 1994)¹ milestones, key decision points, and other project requirements. The pro and con aspects of each strategy also were tabulated. Using this information as a basis, the LLWVP Project team members, along with representatives of Tank Waste Remediation System (TWRS) Engineering, TWRS Programs, and Procurement Materials Management, formed a Westinghouse Hanford Company (WHC) evaluation team to select the best strategy. Kepner-Tregoe² decision analysis techniques were used in facilitated meetings to arrive at the best balanced choice.

The best strategy is referred to as alternative 9, wherein two or more subcontractor teams are selected via a Request for Qualification solicitation. Each team, on a limited cost-reimbursable basis, is required to submit a competitive, comprehensive, fixed-price proposal for the complete design, construction, startup, and operation of the plant. The proposal would include a design concept as well as a life-cycle cost analysis for the plant. The WHC

¹Ecology, EPA, and DOE, 1994, *Hanford Federal Facility Agreement and Consent Order*, as amended, Washington State Department of Ecology, U.S. Environmental Protection Agency, and U.S. Department of Energy, Olympia, Washington.

²Kepner Tregoe is a trademark of Kepner-Tregoe, Inc.

would select the overall best proposal based on preestablished comprehensive criteria, and perform final negotiations with the proposer as necessary for the project to go forward on a firm, fixed-price basis. If these negotiations were unsuccessful, negotiations would start with the next best subcontractor team, and so on. Should none of the proposals be adequate for proceeding on a firm, fixed-price basis as discussed above, WHC would then select the best qualified team and go forward on a more conventional basis, such as cost plus fixed fee options for Title I, II, and III design and construction management.

In arriving at the selected best contracting strategy, the WHC evaluation team was aware of the ongoing facility configuration studies being developed by TWRS. It is believed that the selected contracting strategy could be applied to any of the facility configurations being evaluated. Documents already prepared or being prepared for a standalone LLWVP lend themselves to modifications suitable for a different facility configuration. The acquisition time line that has been prepared for the standalone LLWVP could also accommodate a different facility configuration.

The selected strategy is considered creative, innovative, and in the best interest of the government. Real competition occurs for design concepts as well as for capital and life-cycle costs. There is a substantial shift of ownership and responsibility for project success from the government to the private sector subcontractor.

The selected strategy is a distinct departure from the past accepted ways of executing major DOE projects. It is also in concert with the current Administration's commitment for reinventing government, the February 1994

Report of the Contract Reform Team,¹ and the DOE's request for contract reform implementation.² Expected benefits to be derived are outstanding contractor performance with significantly lower capital and life-cycle costs, as well as potential schedule improvements.

¹DOE, 1994, *Making Contracting Work Better and Cost Less*, Report of the Contract Reform Team, DOE/S-0107, U.S. Department of Energy, Washington, D.C.

²Grumbly, T. P., and J. D. Wagoner, 1994 (letter 940/440B to Dr. A. L. Trego, February 9), U.S. Department of Energy, Washington, D.C.

This page intentionally left blank.

CONTENTS

1.0	INTRODUCTION	1
1.1	PURPOSE	1
1.2	SCOPE AND APPLICABILITY	1
1.3	BACKGROUND	1
2.0	DECISION ANALYSIS	2
2.1	PRELIMINARY ACTIONS	2
2.1.1	Investigative	2
2.1.2	Development	3
2.1.3	Kepner-Tregoe Outline	12
2.1.4	Decision Statement	13
2.2	ESTABLISH OBJECTIVES	13
2.3	CLASSIFY OBJECTIVES INTO "MUSTS" AND "WANTS"	14
2.4	WEIGHTING VALUES	16
2.4.1	Method of Assigning Weighting Values to "Wants" Objectives	16
2.4.2	Method of Assigning Values to Strategy Alternatives	16
2.4.3	Overall Scoring of Strategy Alternatives	16
2.4.4	Final Rankings	16
2.5	ASSESS ADVERSE CONSEQUENCES - DETERMINE PROBABILITY/ SERIOUSNESS	16
2.5.1	Alternative 9	18
2.5.2	Mitigation of Adverse Consequences - Alternative 9	18
2.6	DETERMINE BEST BALANCED CHOICE	20
2.7	PRIVATIZATION DISCUSSION	22
2.8	OFF RAMPS	23
3.0	CONCLUSIONS AND RECOMMENDATIONS	24
4.0	REFERENCES	26
5.0	GLOSSARY	26

LIST OF FIGURES

1	Alternative 1 - Conventional: A Qualification Based Architect-Engineer Contract <u>and</u> A Qualification Based General Construction Contractor Contract	28
2	Alternative 2 - Architect-Engineer/Construction Manager: A Single Qualification Based Contract for Architect-Engineer Services and Construction Management	29
3	Alternative 3 - Architect-Engineer/Construction Manager Converted to Negotiated Fixed-Price Design/Build with Performance Guarantee . .	30
4	Alternative 4 - Architect-Engineer/Construction Manager Converted to Privatized Design/Build/Operate	31
5	Alternative 5 - Qualification Based Architect-Engineer for Conceptual Design then Competitive, Fixed-Price Design/Build with Performance Guarantees	32
6	Alternative 6 - Qualification Based Architect-Engineer for Conceptual Design then Competitive, Fixed-Price, Privatized Design/Build/Operate	33
7	Alternative 7 - In-House Architect-Engineer for Conceptual Design then Competitive, Fixed-Price Design/Build with Performance Guarantees	34
8	Alternative 8 - In-House Architect-Engineer for Conceptual Design then Competitive, Privatized Design/Build/Operate	35
9	Alternative 9 - Two or More Subcontractor Teams and Competitive, Fixed-Price Proposals Including Design Concepts	36
10	Alternative 10 - Two or More Subcontractor Teams and Competitive, Privatized Design/Build/Operate Proposals	37

LIST OF TABLES

1	Low-Level Waste Vitrification Plant Acquisition Strategies	4
2	Evaluation Team Combined Education and Work Experience	12
3	Musts	15
4	Wants	17
5	Adverse Consequences of Alternative 9	19

**LOW-LEVEL WASTE VITRIFICATION PLANT PROJECT
CONTRACTING STRATEGY
DECISION ANALYSIS REPORT**

1.0 INTRODUCTION

1.1 PURPOSE

The purpose of this decision analysis process is to determine the contracting strategy that should be used for designing, constructing, and operating a low-level waste vitrification plant (LLWVP).

1.2 SCOPE AND APPLICABILITY

The decision analysis process focused on a facility scope similar to a standalone LLWVP. However, the applicability of the analysis results could be extended to similar projects at the Hanford Site or to an LLWVP Project with extended scope, such as waste pretreatment functions or the addition of some high-level waste processing functions.

1.3 BACKGROUND

The current Administration is committed to certain reinventing government initiatives including contract reform as reported in the Report of the Contract Reform Team (DOE 1994) and requested in U.S. Department of Energy (DOE) correspondence to Westinghouse Hanford Company (WHC) (Grumbly and Wagoner 1994).

More specifically, the DOE projects of this size and type have a history of cost overruns and schedule slippages. The WHC and DOE are seeking creative and innovative contracting methods to remedy the situation, and a shift of cost, schedule, and performance responsibility from the government to private sector subcontractors will help. The LLWVP Project represents an immediate opportunity to apply new contracting strategies that will significantly improve performance in this area. The project plan calls for the selection of an Architect-Engineer/Construction Manager (AE/CM) via a qualification-based solicitation with conceptual design starting in December 1994. This plan only moderately deviates from past DOE contracting strategies of marginal performance, which have led to cost overruns and schedule slippages. Should a new contracting strategy be agreed upon, the Statement of Work for the AE/CM and the AE/CM selection criteria would be modified to accommodate the new contracting strategy. Similarly, documents being developed, such as the functions and operational requirements (F&OR) document and the plant performance specification, would be adjusted as necessary to reflect a different contracting strategy.

Because of the project complexity and the numerous contracting alternatives available, a structured decision analysis methodology was considered necessary to arrive at the best balanced choice of proposed

alternatives. The Kepner-Tregoe* methodology of decision analysis was selected because of its proven track record and the familiarity of the project participants with this approach.

2.0 DECISION ANALYSIS

2.1 PRELIMINARY ACTIONS

2.1.1 Investigative

Project personnel conducted discussions with selected Architect-Engineers (A-E) and constructors regarding their experience with large, DOE-type projects in an effort to understand underlying causes for past failures and successes. Their input was solicited with regards to possible contracting strategies being contemplated by WHC.

Other government agencies (e.g., U.S. Army Corps of Engineers) and other industries, such as the aerospace industry (e.g., Thompson Remo Woolridge [TRW]), also were contacted to learn of possible strategies that could be used for the LLWVP Project. Los Alamos Technical Associates (LATA) was requested to prepare a report wherein acquisition strategies employed by the U.S. Department of Defense (DOD) in major systems acquisitions and the private sector are summarized and evaluated. Los Alamos Technical Associates/TRW also were asked to evaluate and comment on the LLWVP Project strategies being considered by WHC and to compare these strategies with "strategies employed by the DOD in major system acquisitions..." The findings and conclusions reached in the report (LATA 1994) are generally supportive of the proposed WHC acquisition strategy. It was concluded by LATA/TRW that "...selecting multiple contractors in the early phases of the contract will create an atmosphere of responsiveness to solve complex issues."

Inquiries also were made to other DOE sites to learn from their experiences as well as to ascertain whether any new contracting strategies were being contemplated or were in place. In the course of the preliminary efforts described above, project personnel also attempted to accommodate the current administration's push for reinventing government, leveraged outsourcing (privatization) of projects, competitive contracting, and other creative/innovative strategies that would break away from the past norm of cost plus fixed fee (CPFF).

Of particular interest at the other DOE sites were the M Area Tank Waste Program at the Savannah River Site and the Pit 9 Comprehensive Demonstration Project at the Idaho National Engineering Laboratory.

The Savannah River project was competitively bid and awarded using "privatization principles," at least to the extent that construction costs would be reimbursed only after the first production of vitrified waste

*Kepner Tregoe is a trademark of Kepner-Tregoe, Inc.

product. The Pit 9 Project initially attempted a privatization strategy for remediation activities for transuranic-contaminated waste. This strategy evolved into proof-of-principle tests being performed by two qualified subcontracting teams that were both substantially reimbursed upon successful completion of the tests; there would have been no payment had the tests been unsuccessful. These two teams ultimately submitted competitive comprehensive proposals for the full Pit 9 Project remediation mission. During proposal preparation, all competing teams also were reimbursed substantial moneys to proceed with safety/permitting issues as necessary for their individual approach to remediation. The final contract award will be made to the "best" proposal. In this project, "a strategy is being executed that provides for private industry demonstration of remediation technology at minimal risk to the government." The "burden of proof is on Contractor. Performance burden for Pit 9 remediation (is) on Contractor."

Previous studies on the subject of DOE contracting for design and construction of large projects also were sought out and used as reference (Grace Commission Report [Fluor 1982]). The Grace Commission Report recommended "the use of a single responsibility contractor for engineering, procurement, construction and startup assistance for the plant."

2.1.2 Development

A large number of contracting strategies were discussed during a 2- to 3-month period when the A-Es, constructors, other DOE and government agencies, and other industries were contacted. Many strategies were discarded because they were not feasible for the LLWVP Project. These contacts and discussions were conducted solely by LLWVP Project personnel.

Ten basic contracting strategies that were considered worthy of further evaluation and consideration were developed. It was recognized that for each of these strategies there might be variations that could improve the strategy, but for manageability and initial analysis an assessment would be made of the ten basic strategies. Subsets of these basic alternatives could be developed later. The ten strategies (alternatives) are described in Table 1. Pro and con arguments were enumerated for each. A macro schedule was included for each alternative depicting key events for the strategy as well as the pertinent Tri-Party Agreement milestones and key decision requirement dates. The exhibit strategies and macro schedules were originally developed by LLWVP Project personnel but were later improved by the Kepner-Tregoe WHC evaluation team as the decision analysis process was in progress.

Selection of the best strategy was the next step. A WHC evaluation team was formed with emphasis placed on diversity of applicable work experience and ensuring representation of a good cross section of the WHC organization. The WHC evaluation team consisted of 11 members representing WHC Construction Projects; Tank Waste Remediation System (TWRS) Programs, Engineering, and Operations; and WHC Procurement and Materials Management.

Table 2 summarizes the education and work experience of the 11-member WHC evaluation team that performed the Kepner-Tregoe decision analysis to determine the best contracting (acquisition) strategy for the LLWVP Project.

Table 1. Low-Level Waste Vitrification Plant Acquisition Strategies. (sheet 1 of 8)

Contract alternative	Type	Description	Pro	Con
1	Conventional	<ul style="list-style-type: none"> Two major contracts: one for design, one for construction. A-E services obtained via Request for Qualification process. CD CPFF with options for Title I, II, and III. Alternatives above could be CPFF, CPIF, fixed price, etc. Construction management and procurement services (GCC) via separate subcontract largely with CPFF basis. Major equipment procurement via competitive bids. Construction subcontracts via competitive bids. WHC performs startup. WHC performs cold operations. WHC performs hot operations. 	<ul style="list-style-type: none"> Design performed by most qualified team. Maintains design continuity. Construction management performed by most qualified GCC. A good alternative when requirements are not well defined or highly subject to change. Maximizes opportunity for WHC input. Most flexible to funding, schedule, or mission changes. Well-defined methods to manage and control work. GCC could use fixed-price subcontracts for construction or self-perform at WHC direction to maximize benefit to the government. All Tri-Party Agreement milestones will be met. 	<ul style="list-style-type: none"> Two separate contracts require large amounts of interface management. This approach on DOE contracts of this scale has the potential for, and history of, large cost increases and schedule slippages. Large amount of WHC interface and input to design results in dilution of A-E ownership of the design. No inherent risk to the government other than cost/schedule overruns inherent with the contracting methodology. May not get lowest prices because of CPFF portions.
2	AE/CM	<ul style="list-style-type: none"> A single contract for design and construction management. AE/CM services obtained via Request for Qualification process. CD CPFF with options for Title I, II, and III, construction management and procurement services, and startup assistance services. Alternatives above could be CPFF, CPIF, fixed price, etc. Major equipment procurement via competitive bids. Construction subcontracts via competitive bids. WHC performs startup. WHC performs cold operations. WHC performs hot operations. 	<ul style="list-style-type: none"> Design performed by most qualified team. Maintains design continuity. Construction management, procurement, and startup assistance performed by most qualified team. Eliminates A-E constructor interface of alternative 1 above. A better alternative when requirements are not well defined or are highly subject to change. Maximizes opportunity for WHC input. Most flexible to funding, schedule, or mission changes. Well-defined methods to manage and control work. Could use fixed-price construction subcontracts. Generally results in a high-quality product. All Tri-Party Agreement milestones will be met. 	<ul style="list-style-type: none"> This approach on contracts of this scale has the potential for, and history of, large cost increases and schedule slippages. Large amount of WHC interface and input to design results in dilution of A-E ownership of the design. No inherent risk to the government other than cost/schedule overruns inherent with the contracting methodology. May not get lowest prices because of CPFF portions.

Table 1. Low-Level Waste Vitrification Plant Acquisition Strategies. (sheet 2 of 8)

Contract alternative	Type	Description	Pro	Con
3	AE/CM for CD then converted to negotiated fixed-price design/ build.	<ul style="list-style-type: none"> • AE/CM services obtained via Request for Qualification process on a scope basis identical to alternative 2. • At completion of CD or Title I design, negotiate a firm, fixed-price with the AE/CM for completion of design and construction of the project with performance guarantees. • AE/CM performs startup. • AE/CM performs cold operations. • AE/CM performs initial operations. 	<ul style="list-style-type: none"> • Design performed by most qualified team. • Maintains design continuity. • Construction management, procurement, and startup assistance performed by most qualified team. • Eliminates A-E constructor interface of alternative 1 above. • "Fixes" plant cost and schedule. • Opportunity to optimize schedule for plant completion and turnover. • More clearly places design and plant performance responsibility with contractor. • All Tri-Party Agreement milestones will be met if negotiations at completion of CD are successful. 	<ul style="list-style-type: none"> • May not get lowest price as this is a negotiated contract as opposed to competitively bid. • Requires a definitive set of design requirements and plant performance specifications that are relatively fixed at time of negotiation. • Minimizes opportunity for WHC design input after CD. • Less responsive to program changes. • If KD3 is not approved by September 30, 1997, there will be a large cost impact caused by delayed start of construction. • Heavily reliant on the performance specification to ensure getting a high-quality plant. • If design or performance requirements change after negotiations, the potential for large cost increases exists.
4	AE/CM for CD then converted to negotiated fixed-price/ privatized design/build/ operate.	<ul style="list-style-type: none"> • AE/CM services obtained via Request for Qualification process on a scope basis identical to alternative 2. • At completion of CD or Title I design, negotiate a firm, fixed-price, privatization-type contract with the AE/CM for completion of design, construction, and operation of the plant with performance guarantees through completion of the plant mission. 	<ul style="list-style-type: none"> • Design performed by most qualified team. • Maintains design continuity. • Construction management, procurement, and startup assistance performed by most qualified team. • Eliminates A-E constructor interface of alternative 1. • No cost to government until product is being produced. • Likely optimum schedule to a producing facility. • "Fixed" LLWVP mission cost. • Plant performance risk clearly on contractor. • All Tri-Party Agreement milestones will be met if negotiations at completion of CD are successful. 	<ul style="list-style-type: none"> • Many new institutional and management issues to resolve because of "privatization." • May not get lowest price as this is a negotiated contract as opposed to competitively bid. • Requires a definite set of design requirements and plant performance specifications at time of negotiation. • Minimizes opportunity for WHC design input after CD. • Less responsive to program changes. • If KD3 is not approved by September 30, 1997, there will be a large cost impact caused by delayed start of construction. • Heavily reliant on the performance specifications to ensure getting a high-quality plant. • If design or performance requirements change after negotiations the potential for <u>very</u> large cost increases exist because the impact carries forward through the lifetime operation of the plant. • Contractor will expect high profit margins in return for long-range financing of plant costs plus the risks assumed. • If plant does not operate as contractor expects, there is an undefined risk to government/WHC in meeting Tri-Party Agreement milestones, mission objectives, etc.

Table 1. Low-Level Waste Vittrification Plant Acquisition Strategies. (sheet 3 of 8)

Contract alternative	Type	Description	Pro	Con
5	A-E for CD then competitive fixed-price design/build.	<ul style="list-style-type: none"> • A-E services only obtained via Request for Qualification process for CPFF CD. • Using CD and WHC prepared plant performance specification, solicit competitive, fixed-price bids to design/build with performance guarantees. • AE/CM performs startup. • AE/CM performs cold operations. • AE/CM performs initial hot operations. 	<ul style="list-style-type: none"> • CD performed by most qualified A-E. • Competitive bidding ensures lower plant cost. • "Fixes" plant cost and schedule. • Clear placement of design and plant performance responsibility with contractor. • Opportunity to optimize schedule for plant completion and turnover. • Tri-Party Agreement milestones for start and completion of construction and initiation of hot operation will be met. 	<ul style="list-style-type: none"> • Possible loss of most qualified A-E and loss of design continuity if award goes to another bidder or if conflict-of-interest issue precludes CD A-E from bidding on the design/build portion. • Schedule penalty for two separate and serial contract placement activities i.e., Tri-Party Agreement milestone for start of definitive design will not be met. • Requires a definitive set of design requirements and plant performance specifications. • Minimizes opportunity for WHC design input after CD. • Less responsive to program changes. • If KD3 is not approved by September 30, 1997, there will be a large cost impact caused by delayed start of construction. • Heavily reliant on the performance specification to ensure getting a high-quality plant. • If design or performance requirements change, the potential for large cost increases exist.

Table 1. Low-Level Waste Vitrification Plant Acquisition Strategies. (sheet 4 of 8)

Contract alternative	Type	Description	Pro	Con
6	A-E for CD then competitive fixed-price privatization.	<ul style="list-style-type: none"> • A-E services <u>only</u> obtained via Request for Qualification process for CPFF CD. • Using CD and WHC prepared plant performance specification, solicit competitive, fixed-price privatization bids for completion of design, construction, and operation of the plant with performance guarantees through completion of the plant mission. 	<ul style="list-style-type: none"> • CD performed by most qualified A-E. • Competitive bidding ensures lower plant cost. • Clear placement of design and plant performance responsibility with contractor. • No cost to government until product is being produced. • Likely optimum schedule to a producing facility. • Fixed LLWVP mission cost. • Tri-Party Agreement milestones for start and completion of construction and initiation of hot operation will be met. 	<ul style="list-style-type: none"> • Many new institutional and management issues to resolve because of "privatization." • Possible loss of most qualified A-E and loss of design continuity if privatization award goes to another bidder or if conflict-of-interest issue precludes CD A-E from bidding on the privatization portion. • Schedule penalty by two separate and serial contract placement activities i.e., Tri-Party Agreement milestone for start of definitive design will not be met. • Requires a definitive set of design requirements and plant performance specifications. • Minimizes opportunity for WHC design input after CD. • Less responsive to program changes. • If KD3 is not approved by September 30, 1997, there will be a large cost impact caused by delayed start of construction. • Heavily reliant on the performance specification to ensure getting a high-quality plant. • If design or performance requirements change, the potential for <u>very</u> large cost increases exist because the impact carries forward through the lifetime operations of the plant. • Contractor will expect high profit margins in return for long-range financing of plant costs plus the risks assumed. • If plant does not operate as contractor expects, there is undefined risk to the government/WHC in meeting Tri-Party Agreement milestones, mission objectives, etc.

Table 1. Low-Level Waste Vitrification Plant Acquisition Strategies. (sheet 5 of 8)

Contract alternative	Type	Description	Pro	Con
7	On-site A-E for CD then competitive fixed-price design build.	<ul style="list-style-type: none"> • A-E services for CD performed by on-site A-E such as KEH. • Using CD and WHC prepared plant performance specification, solicit competitive, fixed-price bids to design/build with performance guarantees. • AE/CM performs startup. • AE/CM performs cold operations. • AE/CM performs initial hot operations. 	<ul style="list-style-type: none"> • No lead time required to solicit and select A-E. • Maximum WHC interface with, and input, to CD. • Competitive bidding ensures lower plant cost. • "Fixes" plant cost and schedule. • Clear placement of design and plant performance responsibility with contractor. • Opportunity to optimize schedule for plant completion and turnover. • Tri-Party Agreement milestones for start and completion of construction and hot startup will be met. 	<ul style="list-style-type: none"> • CD will not reflect specialized industry experience that would be obtained via Request for Qualification process-type A-E selection. • Loss of design continuity. • Requires a definitive set of design requirements and plant performance specifications. • Minimal WHC input after CD. • Less responsive to program changes. • If KD3 is not approved by September 30, 1997, there will be a large cost impact caused by delayed start of construction. • Tri-Party Agreement milestone for start of definitive design will not be met. • Heavily reliant on the plant performance specification to ensure getting a high-quality plant. • If design or performance requirements change, the potential for large cost increases exist.

Table 1. Low-Level Waste Vitrification Plant Acquisition Strategies. (sheet 6 of 8)

Contract alternative	Type	Description	Pro	Con
8	On-site A-E for CD then competitive fixed-price privatization.	<ul style="list-style-type: none"> • A-E services for CD performed by onsite A-E such as ICF KH. • Using CD and WHC prepared plant performance specification, solicit competitive, fixed-price privatization bids for completion of design, construction, and operation of the plant with performance guarantees through completion of the plant mission. 	<ul style="list-style-type: none"> • No lead time required to solicit and select A-E. • Maximum WHC interface with, and input, to CD. • Competitive bidding ensures lower plant cost. • Clear placement of design and plant performance responsibility with contractor. • No capital cost to government until product is being produced. • Likely optimum schedule to a producing facility. • Fixed LLWVP mission cost. • Tri-Party Agreement milestones for start and completion of construction and hot startup will be met. 	<ul style="list-style-type: none"> • Conceptual design/build will not reflect specialized industry experience that would be obtained via the Request for Qualification process-type A-E selection. • Many new institutional and management issues to resolve because of "privatization." • Loss of design continuity. • Requires a definitive set of design requirements and plant performance specifications. • Minimal WHC input after CD. • Less responsive to program changes. • If KD3 is not approved by September 30, 1997, there will be a large cost impact caused by delayed start of construction. • Tri-Party Agreement milestone for start of definitive design will not be met. • Heavily reliant on the plant performance specification to ensure getting a high-quality plant. • If design or performance requirements change, the potential for <u>very</u> large cost increases exist because the impact carries forward through the lifetime operations of the plant. • Contractor will expect high profit margins in return for long-range financing of plant costs plus the risks assumed. • If plant does not perform as contractor expects, there is an undefined risk to the government/WHC in meeting Tri-Party Agreement milestones, mission objectives, etc.

Table 1. Low-Level Waste Vitrification Plant Acquisition Strategies. (sheet 7 of 8)

Contract alternative	Type	Description	Pro	Con
9	<ul style="list-style-type: none"> Two or more subcontracting teams Fixed-price design/build/operate proposals. 	<ul style="list-style-type: none"> Two or more subcontracting teams are selected via the Request for Qualification process solicitation. A definitive set of design requirements and plant performance requirements are available before start of proposal preparation. The subcontracting teams (on a cost reimbursable but not to exceed a fixed amount basis) must develop and submit to WHC a comprehensive proposal that includes: <ul style="list-style-type: none"> Design concept Life-cycle cost analysis Firm, fixed-price for completion of design, construction, and startup of the plant through hot performance/acceptance testing and 5 years subsequent operation For continued operation after first 5 years. No advance CD planned. The selected contracting team will execute the above scope and upon successful completion, turn over the plant to the owner for owner operation. Optional contract to operate facility. 	<ul style="list-style-type: none"> Multiple contracting teams provide opportunity for more facility concepts to be developed and examined. Design concepts will be fully developed to generate information necessary for fixed-price competitive bidding. Design concepts will be meaningful and realistic because design will not start until melter test program data are available, WHC site studies are completed, plant performance requirements are set, etc. Provides for selecting "most qualified" subcontractor teams while maintaining life-cycle plant cost as a key selection factor for continuation beyond the conceptual phase. Team performing design concept is the one continuing into subsequent design phases thus maintaining continuity. Fixed plant cost and schedule. This approach is competitive, creative, and innovative. All Tri-Party Agreement milestones will be met. Competitive design concepts and bidding with life-cycle cost considerations creates an atmosphere conducive to obtaining the best value plant for the government. Clear placement of design and plant performance responsibility with contractor. Likely optimum schedule to a producing facility. 	<ul style="list-style-type: none"> Minimal WHC input after definition of design requirements and plant performance requirements. Less responsive to program changes. If KD3 is not approved by September 30, 1997, there will be a large cost impact caused by delayed start of construction. Heavily reliant on the plant performance specification to ensure getting a high-quality plant. If design or performance requirements change, the potential for large cost increases exist. WHC would need to perform its own estimate of design and construction costs by February 1995 for budget validation purposes to meet the key decision requirements stated above.

Table 1. Low-Level Waste Vitrification Plant Acquisition Strategies. (sheet 8 of 8)

Contract alternative	Type	Description	Pro	Con
10	<ul style="list-style-type: none"> Two or more subcontracting teams Fixed-price design/build/operate privatization proposals 	<ul style="list-style-type: none"> Two or more contracting teams are selected via the Request for Qualification process. A definitive set of design requirements and plant performance requirements are available before start of proposal preparation. The contracting teams (on a cost reimbursable but not to exceed a fixed amount basis) must develop and submit to WHC a comprehensive proposal that includes: <ul style="list-style-type: none"> Design concept Privatization-type scheme for completion of design, plant construction, and operation through to completion of the project mission. No advanced CD planned. The selected contracting team will execute the above scope and be reimbursed according to the terms of the privatization agreement. 	<ul style="list-style-type: none"> Multiple contracting teams provide opportunity for more facility concepts to be developed and examined. Design concepts will be fully developed to generate information necessary for fixed-price, competitive privatization bidding. Design concepts will be meaningful and realistic because design will not start until melter test program data are available, WHC site studies are completed, plant performance requirements are set, etc. Provides for selecting "most qualified" subcontracting teams while maintaining life-cycle plant cost as a key selection factor for continuation beyond the conceptual phase. Team performing design concept is the one continuing into subsequent design phases thus maintaining continuity. Fixed plant cost and schedule. This approach is competitive, creative, and innovative. All Tri-Party Agreement milestones will be met. Competitive design concepts and bidding with life-cycle cost considerations creates an atmosphere conducive to obtaining the best value plant for the government. Clear placement of design and plant performance responsibility with contractor. Likely optimum schedule to a producing facility. Fixed LLWVP mission cost. No major cost to government until product is being produced. 	<ul style="list-style-type: none"> Many new institutional and management issues to resolve because of "privatization." Requires a definitive set of design requirements and plant performance specifications. Minimal WHC input after definition of design requirements and plant performance requirements. Less responsive to program changes. If KD3 is not approved by September 30, 1997, there will be a large cost impact caused by delayed start of construction. Heavily reliant on the plant performance specification to ensure getting a high-quality plant. If design or performance requirements change, the potential for <u>very</u> large cost increases exist because the impact carries forward through the lifetime operations of the plant. Contractor will expect much higher profit margins in return for long-range financing of plant costs plus the risks assumed. If plant does not perform as contractor expects, there is an undefined risk to the government/WHC in meeting Tri-Party Agreement milestones, mission objectives, etc. WHC would need to perform its own estimate of design and construction costs by February 1995 for budget validation purposes to meet the key decision requirements stated above.

A-E = Architect-Engineer
AE/CM = Architect-Engineer/Construction Manager
CD = Conceptual design
CPFF = Cost plus fixed fee
CPIF = Cost plus incentive fee
DOE = U.S. Department of Energy
GCC = General Construction Contractor
LLWVP = Low-Level Waste Vitrification Plant
WHC = Westinghouse Hanford Company

Table 2. Evaluation Team Combined Education and Work Experience.

Education category	Total years	Individual contributors
Bachelor of science	10	10
Master of science	6	6
Doctor of philosophy (Ph.D.)	2	2
Work category	Total years	Individual contributors
Professional work experience	328	11
Major government projects	156	11
Major commercial projects	45	3
Operation/process engineering	84	7
Major government contracts/procurement	38	6
Major commercial contracts/procurement	44	6
Permitting/regulatory compliance	5	1

The decision analysis meetings were professionally facilitated by Dr. J. P. Fabian who has facilitated numerous strategic planning, problem-solving, decision-making, and team development efforts for management and professional groups since he started his organization and development work on the Hanford Site with Pacific Northwest Laboratory in 1975.

2.1.3 Kepner-Tregoe Outline

The Kepner-Tregoe methodology of decision analysis was selected because of its proven track record and the familiarity of the project participants with the approach. The basic outline for the facilitated meetings that would arrive at a decision was stated as follows.

- State decision.
- Establish objectives.
- Classify objectives into "musts" and "wants."
- Develop/list alternatives.
- Assess adverse consequences--determine probability/seriousness.
- Determine best balanced choice.

2.1.4 Decision Statement

After a brainstorming session, the WHC evaluation team unanimously arrived at the following decision statement:

"Determine the best contracting strategy for designing, constructing, and operating a low-level waste (LLW) vitrification facility."

2.2 ESTABLISH OBJECTIVES

The WHC evaluation team arrived at the following objectives (unedited from meeting notes) for the contracting strategy:

- Meets Tri-Party Agreement milestones
- Ensures competition
- Stays within procurement regulations
- Transfers risk to private sector
- Establishes risk for transfer
- Meets functions and requirements of plant
- Obtains world-class vitrification expertise
- Provides plant that works
- Provides plant that has best value for the government or lowest life-cycle costs
- Ensures consistency with melter technology selection
- Frees subcontractor to chose its solutions and be creative
- Minimizes likeliness of litigation from stakeholder
- Provides a plant that is simple to operate and maintain
- Selects an alternative that is less sensitive to changes in technical, program, budget, etc.
- Establishes a sellable funding profile
- Establishes interactive responsibilities for DOE, WHC, and subcontractor (for what, when, how, etc.)
- Remains consistent with project definition
- Ensures the strategy is agreeable to Thomas Grumbly

- Ensures subcontractor has operations expertise in addition to design/construction
- Allows compliance activities to be achieved within schedule constraints (adverse consequence)
- Maintains compatibility with TWRS end functions (i.e., retrieval, pretreatment, high-level waste)
- Provides contracting alternatives that ensure adequate (people) resources in the subcontracting team
- Provides enough time to develop F&OR document and criteria/specification documents by WHC.

2.3 CLASSIFY OBJECTIVES INTO "MUSTS" AND "WANTS"

The objectives were examined and, in order to fit the "musts" category, the following attributes were necessary:

- Mandatory
- Measurable
- Realistic.

The "musts" objectives are required for a strategy alternative to be considered viable: they are a "go"/"no go" gauge. The following were determined to be "musts:"

- Meets Tri-Party Agreement milestones for hot startup (June 2005) and mission completion (December 2028)
- Ensures competition
- Stays within current procurement regulations.

All alternatives passed the go/no go criteria. See Table 3.

The "wants" objectives were condensed as follows:

- Meets all other Tri-Party Agreement interim and target milestones
- Maximizes the transfer of responsibility and associated risks to the subcontractor
- Minimizes constraints in development of technical requirements document; sensitive to change in initial technical requirements document
- Subcontracting team includes world-class vitrification, design, construction, and operations expertise; resources are dedicated
- Subcontractor is free to be creative with solution to provide an easily operated and maintained plant

Table 3. Musts.

Alternatives	1		2		3		4		5		6		7		8		9		10	
	Information	Go/ No Go	Information	Go/ No Go	Information	Go/ No Go	Information	Go/ No Go	Information	Go/ No Go	Information	Go/ No Go	Information	Go/ No Go	Information	Go/ No Go	Information	Go/ No Go	Information	Go/ No Go
Musts	Comments		Comments		Comments		Comments		Comments		Comments		Comments		Comments		Comments		Comments	
Meet TPA milestones for - hot startup (8/05) - mission completion (12/28) Ensure competition Stays within current procurement regulations		All go		All go		All go	Possibly less bidders	All go		All go	Possibly less bidders	All go		All go	Possibly less bidders	All go	Possibly more competition	All go	Possibly more competition, Possibly less bidders	All go

Definition of "Musts" - Mandatory, measurable, realistic

- Minimizes life-cycle costs
- Reasonable total project cost funding profile
- Sensitive to program and budget changes.

2.4 WEIGHTING VALUES

2.4.1 Method of Assigning Weighting Values to "Wants" Objectives

"Wants" objectives are usually not of equal importance in the decision, so additional classification is necessary. A simple and effective way to do this weighting is by indicating relative importance on a 10-1 scale. The "wants" objective that stands out as most important is assigned a 10 with the others being assessed relative to that benchmark. In some decisions, two or more objectives will be determined to be of equal importance. In this case, the objectives are assigned the same weight. An objective assigned a weight of 5 has half the influence as the objective assigned a weight of 10.

By consensus vote, the facilitated team assigned weight values to each "wants" objective as shown in Table 4.

2.4.2 Method of Assigning Values to Strategy Alternatives

The same numbering system as described above was used to record the team's judgement of the strategy alternatives. Results are shown in Table 4.

2.4.3 Overall Scoring of Strategy Alternatives

Arithmetic manipulation of weights and scores was used to determine the final scores of each alternative.

2.4.4 Final Rankings

Final rankings are based on overall arithmetic scores. Alternative 9 was rated the highest followed by alternatives 10 and 2. See Table 4.

2.5 ASSESS ADVERSE CONSEQUENCES - DETERMINE PROBABILITY/SERIOUSNESS

Alternatives 9 and 10 are essentially the same with the exception that alternative 9 includes a firm, fixed-price for design, construction, and operation whereas alternative 10 requires privatization for design, construction, and operation through completion of the mission.

The WHC evaluation team believes alternative 10 has institutional issues that will require time to resolve.

Table 4. Wants.

Alternatives	1		2		3		4		5		6		7		8		9		10			
Wants	WT	Information	SC	WT	SC	WT	SC	WT	SC	WT	SC	WT	SC	WT	SC	WT	SC	WT	SC	WT	SC	
1. Meet TPA interim & target milestones	9		8	81		10	80		6	54		5	45		4	36		2	18		3	27
2. Maximize the transfer of responsibility & associated risk to contractor	7		2	14		3	21		6	42		7	49		7	49		9	63		8	56
3. Minimize constraints on developing tech requirements document. Sensitivity to change in initial tech requirements document	6		9	54		10	80		8	36		3	18		5	30		3	18		5	30
4. AECM teams includes world-class verification design, construction, and operations expertise. Resources are dedicated	10		3	30		6	60		7	70		7	70		6	60		5	50		5	50
5. A-E free to be creative with solutions to provide plant that is simple to operate and maintain	8		2	16		3	24		4	32		8	64		6	48		7	56		9	72
6. Minimize life-cycle costs	3		4	12		5	15		6	18		2	6		8	24		2	6		10	30
7. Reasonable TPC funding profile	2		7	14		7	14		2	4		8	16		2	4		8	16		2	4
8. Sensitivity to program and budget changes	4		10	40		9	36		7	28		2	8		6	24		2	8		4	16
Total				261			320			284			276			275			245			235
Final Ranking				8			3			4			5			6			9			7

Wants that were deleted

- Reasonable operating cost profile – This was combined with "life cycle costs" want #6
- Minimize no. of contracts – considered not to be a discriminator among the 10 options, thus not a want
- Consistent with meter technology timetables – did not consider meter technology selection a want discriminator but rather an adverse circumstance

2.5.1 Alternative 9

The Kepner-Tregoe methodology requires that all potentially adverse consequences of pursuing the highest-ranked strategy be listed. The probability of these consequences occurring and the seriousness of the consequence is assessed. For the highest-ranked alternative 9, "Competitive Fixed Price Proposals Including Design Concept," the adverse consequences are as follows (Table 5).

2.5.2 Mitigation of Adverse Consequences - Alternative 9

The Kepner-Tregoe methodology further requires that ideas and approaches be developed to mitigate the adverse consequences that were identified. The ideas developed were as follows.

- Use other performance specifications as guide (e.g., TRW source information).
- Hire performance specification expert.
- Start preparing performance specification in fiscal year (FY) 1994.
- Expand current site engineering studies/trade studies to include cost estimates for the LLWVP.
- Have ICF Kaiser Hanford Company (ICF KH) perform preconceptual with a cost estimate.
- Develop marketing strategy with benefits.
- Play on Al Gore theme of reinventing government.
- Garner the support of Jay Inslee, etc.
- Have Ken Bracken present to Thomas Grumbly.
- Cite other DOE case histories of competitive design/builds.
- Present a case for revising milestone for starting definitive design, based on benefits of contracting strategy, to the Washington State Department of Ecology.
- Establish strong negotiating team; define criteria for evaluation of proposals.
- Request preliminary evaluation criteria by February 1995, final by August 1995.
- Fix cost for proposal preparation for each competitor.
- Formulate a method of developing detailed design requirements with full buy-in by TWRS.

Table 5. Adverse Consequences of Alternative 9.

Consequence	P	S
1. Lack of information to prepare performance specifications by August 1995	H	M
2. Meeting start of definitive design, November 1996	M	L
3. Believable construction cost estimate by February 1996	H	M
4. Not compatible with melter selection	M	L
5. Additional cost of competitive design	L	L
6. Minimum WHC input after definition of design requirements	H	L
7. Less responsive to program and technical changes	H	M
8. Key Decision 3 early approval needed	H	L
9. Never before done by U.S. Department of Energy, Richland Operations Office (RL); therefore, RL may not accept	H	H
10. Difficult final negotiation	H	M
11. Getting the selection criteria for evaluation	M	L
12. Schedule compression for selection of winner	H	M

P = Probability

H: Not surprised if it happens
M: Might happen but not sure
L: Surprised if it does

S = Seriousness

H: Disaster
M: Impacts exist but they are manageable with added resources
L: Manageable without added resources

WHC = Westinghouse Hanford Company

- Request U.S. Department of Energy, Richland Operations Office (RL) to proceed with Key Decision 3 concurrent with Key Decisions 1 and 2.
- Provide a dedicated team (with no other work assignments) for up to 3 months to evaluate and award final contract.
- Allow project manager to make final selection decision.
- Make project manager source selection officer.

- Need intelligent team to determine resources. Need detailed plan and buy-in for all resources to execute schedule up to Title I.
- Develop flexible contracting alternatives within basic structure of alternative 9.
- Define/show fall-back position for this alternative, i.e., the "off ramp."

The WHC evaluation team believes that a proper mix of the above ideas applied to alternative 9 will adequately mitigate the adverse consequences identified.

2.6 DETERMINE BEST BALANCED CHOICE

After completing the relatively rigorous Kepner-Tregoe steps required for grading the various alternatives, including listing the adverse consequences and mitigation thereof, the WHC evaluation team defined the key advantages of alternative 9. Listed below are the advantages and rationale for selecting alternative 9.

- Westinghouse Hanford Company expects better design and project development from an organization that accepts full responsibility for design, construction, and operation with ultimate and full responsibility for plant performance.
- Westinghouse Hanford Company consensus was that the industry is mature enough to put together several viable subcontracting teams that would consist of A-E, constructor, technologist, and operator. These teams, working with current state-of-the-art technology, can design, build, and operate an LLWVP. If the scope of the LLWVP is expanded to include separations, this is still within the industry capability. Depending on the melter technology testing results, pilot-scale testing could be part of the subcontractor team scope.
- The competing proposal strategy ensures the best value to the government. The strategy allows WHC to define the proposal deliverables. Negotiations and final subcontractor selection will be based on significant amounts of data: design concept; design, construction, equipment, and operating costs; project/business plans; life-cycle cost analysis; plant total operating efficiency analysis; and schedules. The goal is to have negotiated fixed-price incentive fee contracting based on performance specifications.
- Alternative 9 (and 10) are significantly different than traditional contracting methods. Alternatives 1, 2, 3, and 4 follow the past practice of selecting a design and/or construction manager subcontractor solely on the basis of qualification (i.e., such as "beauty contest" winners selected on beauty). These subcontractors stay for the project duration regardless of their performance. In alternatives 5, 6, 7, and 8, Hanford Site-directed conceptual designs are produced by traditional A-Es--qualification selected or ICF KH. Alternative 9 employs a two-step approach. First, broad-

based teams are selected based on team makeup, experience, and organizational structure. Second, the teams are tested to produce a proposal that reflects a plant life cycle for which they have full responsibility. The test results (proposals) provide two important things: an indication of these newly formed teams to work together, and important data used for negotiation and final selections. Because these competing teams develop their "own" design concepts, the ownership chain is not broken. There are no similar qualification tests for alternatives 1, 2, 3, and 4 subcontractors. Alternatives 1 through 8 have conceptual designs that are Hanford Site driven and approved. The ownership chain is broken for alternatives 1 through 8.

- Alternative 9 shifts performance responsibility from the government to the subcontractor. Subcontractors are willing to accept this responsibility if they have reasonable control over what is designed and built. They must have latitude in how the facility is to operate. Alternative 9 fulfills that need for subcontractor control and latitude.
- Alternative 9 does not violate any existing government procurement regulations. There are questions concerning the government's ability to write service contracts greater than 5 or 10 years. Alternative 9 addresses this issue by having the project include 2 to 3 years of hot operations to verify production performance guarantees. This is followed with 5-year options for continued operation. This skirts the long-term service contract issue associated with privatization.
- Alternative 9 dictates discipline relative to changing requirements. Requirements must be solidified before design concept preparation. Requirements cannot include open questions relative to plant scope. These issues must be resolved before proposal preparation begins. This alternative can be cost effective if restraint is exercised. Neither WHC nor RL can have their "preferences." The subcontracting teams envisioned in this alternative have the ability to interpret DOE Orders, consensus codes, Washington State codes, and federal regulations without a great deal of help from the Hanford Site. Changes would be limited to new information about feed stock being retrieved and changes to glass performance requirements. If reasonable envelopes are used for feed and glass specifications, future impacts would be minimized.
- Schedules developed around alternative 9 indicate all Tri-Party Agreement dates would be met. One date, definitive design start, is somewhat marginal and may require a Tri-Party Agreement change. This date may be pushed out by contract negotiation. Westinghouse Hanford Company believes the state would be receptive to such a minor change, if necessary.
- Alternative 9 has flexibility relative to changing contracting strategies. If fixed-price contracts cannot be negotiated, Title I design could still be started using one of the subcontracting teams.

Title I would be a cost-plus contract. Subsequent project phases would be negotiated.

2.7 PRIVATIZATION DISCUSSION

A summary of privatization issues is provided in the following list.

- Privatization was considered in four contracting alternatives.
- Alternative 10 was considered the best strategy to privatization because of the elements of competition and ownership. Several teams would be asked to present competitive proposals. From the beginning, the subcontracting team must assume ownership.
- The WHC evaluation team concluded that a privatization strategy may be more costly than a competitive, government-funded design, build, and operate strategy. The basis for this conclusion is that risk venture capital is not cheap. The up-front LLWVP cost will be \$500 million to \$1.2 billion. Payback would not come until many years into the contract. Money lenders would expect a great deal for their investment. Some preliminary indications on the Environmental Corporation of America (ECA) proposal indicate payback expectations are very high. While privatization solves a near-term government funding problem, the taxpayers may pay more later. Privatization essentially shifts the cost burden to a future administration.
- Privatization benefits that have been promoted are that the subcontractor would not "gold plate" a design or operational methods, or would not operate in a "zero risk" environment. The DOE has little experience in this arena.
 - Reduction in "gold plate" and movement away from a "zero risk" environment can be achieved through competition and ownership with other contracting alternatives. The use of fixed-price incentive contracts based on competitive proposals should make projects more cost effective. This desired effect can be achieved through government-funded projects. However, an essential element is that subcontractors take full ownership from the beginning through the operational phase.
- Theoretically, privatization subcontracting can be executed based on a project F&OR document. The challenge offered by this strategy is that a high-capacity (100- to 200-tons/day) LLWVP does not exist anywhere in the world. A subcontracting team must develop a design concept and a new program for implementation. This is a very different condition, for example, than ECA's high-level vitrification proposal and the laundry facility at the Hanford Site. The ECA proposal uses an existing French design and requests that the Hanford Site adjust its program to match. The laundry facility used an existing design and was a relatively low-cost venture.

- There is significant risk for LLWVP privatization in the minds of several potential subcontractors. Informal contacts indicated there was not too much interest in privatization. Subcontractors indicated they could not commit to privatization without performing significant up-front work. Up-front work varied from 9 to 16 months of engineering, design, estimating, and formal proposal preparation. In some cases, a subcontracting team would do some melter testing before making a decision.
- Several potential privatization subcontractors are awaiting the results of the ECA proposal evaluation. The manner in which the DOE handles the privatization issue on this major facility will affect future subcontractor participation. Long-term service contracting (10 years or more), payback periods, and contingency liability contract clauses are key privatization issues. If these issues are resolved, privatization contracts may be very attractive.
- Privatization should be kept open as a viable option for contracting. The primary value would be near-term delay in capital dollars spending. Until a request for privatization proposal is issued, the real interest from industry will not be known.

2.8 OFF RAMPS

Westinghouse Hanford Company believes alternative 9 is viable and would be accepted by the industry. There is risk that the desired results may not be achieved. The WHC evaluation team discussed the risks and developed what are termed "off ramps." These off ramps are adjustments to the basic contracting strategy. Potential risks and adjustments that could be made by the project are summarized below.

1. Risk--Subcontracting teams not interested in alternative 9.

Adjustment--Determine the negative response early and change contracting strategy to perform conceptual design with the best-qualified A-E, and reevaluate the contracting strategy for subsequent project phases. Use the *Commerce Business Daily* notice for "expression of interest" and follow up with meetings with potential bidders. Current schedule will allow change.

2. Risk--Subcontracting teams interested but teams not acceptable.

Adjustment--Select best qualified A-E to perform conceptual design and reevaluate the contracting strategy for subsequent project phases. Conceptual design would be cost plus. No schedule problems are anticipated for this adjustment.

3. Risk--Subcontracting teams do not submit proposals at the end of 12 months.

Adjustment--Develop an early warning system and ensure flexibility at the onset. Ideally, select three teams to compete. Conduct preaward conferences to ensure complete understanding of Request of

Proposal. Require work plans from three competing teams. Source selection board will monitor progress monthly. This should reveal problems early. At the first sign that completion will not be achieved by two teams, revise strategy to complete one conceptual design and negotiate Title I and subsequent phases. Start of definitive design schedule would be a problem only if all three teams dropped out.

4. Risk--Subcontracting teams submit proposals. However, proposals have too many exceptions, caveats, or information voids.

Adjustment--Conduct repeated negotiations with each team before final selection. Eliminate all outstanding issues preventing contract final negotiation. These extensive negotiations may require some flexibility in the Tri-Party Agreement milestone for start of definitive design. If it becomes impossible to proceed with any of the teams, then select the best available team on the basis of CPFF or cost plus incentive fee for the subsequent project phases and construction management.

At this time, alternative 9 appears to be the best contracting strategy. Alternative 10 is basically the same strategy as alternative 9 except private funding would be required for design, facility construction, and startup. If, however, there is considerable positive interest in privatization and DOE handles institutional problems, contracting strategies can be adjusted. Adjustment should occur when the Request for Qualification is issued. However, adjustments also could be made at the time of Request for Proposal. It is critical to determine the real interest in privatization. An expression of interest in the *Commerce Business Daily* notice followed by a bidders conference may give insight into industry interest.

3.0 CONCLUSIONS AND RECOMMENDATIONS

Alternative 9 stands above the other contracting strategies and is the WHC-selected strategy for the LLWVP Project. This approach will ensure high-quality subcontractor teams by establishing high minimum standards for those teams that express interest in designing, building, and operating (DBO) the LLWVP. Only the two or three best-qualified teams will participate in the submittal of DBO proposals. Selected teams will be highly motivated to be creative, innovative, and cost effective in preparing their design concepts and comprehensive DBO proposals because they will be in direct competition with the other teams, and will ultimately be responsible for the performance of the facility. Westinghouse Hanford Company's evaluation of the comprehensive proposals will determine the one proposal that is in the overall best interest of the client, DOE. Subsequent negotiations with the best proposer should result in a very satisfactory design, build, and operate subcontract for the LLWVP Project.

A large shift of responsibility from the government to the subcontractor is inherent in this strategy because of the performance guarantees that are the responsibility of the subcontractor. All Tri-Party Agreement milestones

are met or exceeded. "Off ramp" strategies previously discussed herein would still provide for meeting the most critical Tri-Party Agreement milestones.

Westinghouse Hanford Company does not intend to dismiss the concept of a privatization strategy for the LLWVP Project. This option will be kept open as long as possible until it becomes obvious that it is not possible. The initial *Commerce Business Daily* solicitation of interest will specifically address the issue of privatization.

As also stated in this report, the alternative 9 strategy is flexible enough to accommodate other plant configurations that may result from the facility configuration studies being performed by WHC.

An action plan will be developed for implementation of alternative 9. Two phases of action must be addressed: short and long term. The short-term action items must include the following.

- Brief WHC management on this decision analysis report and obtain approval. Action: LLWVP Project (Complete)
- Brief RL management on this decision analysis report and obtain concurrence. Action: LLWVP Project
- Request RL approval to solicit AE/CM services for the LLWVP Project (Quigley 1994). This letter was verbally approved on April 29, 1994, with a confirmatory letter that followed (Cone 1994). A supplemental letter outlining the procurement strategy changes only should be sent to RL for approval. Action: LLWVP Project and procurement and materials management (PMM)
- Make an announcement in the *Commerce Business Daily* requesting an expression of interest from qualified firms (or teams of firms) for design/build/operate participation in the LLWVP Project as delineated in alternative 9.
- Modify the alternative 9 strategy, as necessary, based on feedback from the expression of interest announcement, and make an announcement in the *Commerce Business Daily* in February 1995 requesting submittal of qualifications.

The long-range action items must include the following:

- A rigorous examination of Section 3.5.2 of this report wherein ideas had been generated to mitigate the adverse consequences of this alternative. An action plan for each adopted idea should be laid out in detail and a summary report prepared. Action: LLWVP Project and PMM
- Including the action plan referred to above, a detailed schedule must be developed for alternative 9 including the several possible courses of action should firm, fixed-price negotiations fail (i.e., the off ramps). Action: LLWVP Project

- Including the action plan above, the FY 1994 and 1995 LLWVP Project work plans must be revised to include staffing/support requirements from other WHC activities. Action: LLWVP Project

4.0 REFERENCES

- Cone, R. E., 1994, *Secretarial Approval of Actions Exceeding \$25 Million* (U.S. Department of Energy Memorandum to R. D. Larson, May 5), U.S. Department of Energy, Washington, D.C.
- DOE, 1994, *Making Contracting Work Better and Cost Less*, Report of the Contract Reform Team, DOE/S-0107, U.S. Department of Energy, Washington, D.C.
- Ecology, EPA, and DOE, 1994, *Hanford Federal Facility Agreement and Consent Order*, as amended, Washington State Department of Ecology, U.S. Environmental Protection Agency, and U.S. Department of Energy, Olympia, Washington.
- Fluor, 1982, *Comparison of U.S. DOE and Industry Practices in Process Plant Procurement* (Grace Commission Report), Fluor Engineering, Irvine, California.
- Grumbly, T. P., and J. D. Wagoner, 1994 (letter 940/440B to Dr. A. L. Trego, February 9), U.S. Department of Energy, Washington, D.C.
- LATA, 1994, *Low-Level Waste Vitrification Plant Project AE/CM Team Acquisition Strategies*, Los Alamos Technical Associates, Los Alamos, New Mexico.
- Quigley, D. K., 1994, *Request for Approval to Solicit for Low-Level Waste Vitrification Plant Project Architect-Engineer/Construction Management Services* (letter 9451722 [PMM-PAR-136 {DW}] to R. D. Larson, March 16), Westinghouse Hanford Company, Richland, Washington.
- Shah, K. R., 1994, *Questions/Responses Regarding GTS Duratek M Area Tank Waste Program* (internal memo 7F730-94-008 to distribution, May 18), Westinghouse Hanford Company, Richland, Washington.

5.0 GLOSSARY

ABBREVIATIONS AND ACRONYMS

A-E	Architect-Engineer
AE/CM	Architect-Engineer/Construction Manager
CPFF	cost plus fixed fee
DBO	designing, building, and operating
DOD	U.S. Department of Defense
ECA	Environmental Corporation of America

F&OR	functions and operational requirements
FY	fiscal year
ICF KH	ICF Kaiser Hanford Company
LATA	Los Alamos Technical Associates
LLWVP	Low-Level Waste Vitrification Plant
PMM	procurement and materials management
RL	U.S. Department of Energy, Richland Operations Office
TRW	Thompson Remo Woolridge
TWRS	Tank Waste Remediation System
WHC	Westinghouse Hanford Company

Figure 1. Alternative 1 - Conventional: A Qualification Based Architect-Engineer Contract and A Qualification Based General Construction Contractor Contract.

Figure 2. Alternative 2 – Architect-Engineer/Construction Manager:
A Single Qualification Based Contract for Architect-Engineer
Services and Construction Management.

Figure 3. Alternative 3 - Architect-Engineer/Construction Manager
Converted to Negotiated Fixed-Price Design/Build
with Performance Guarantee.

Figure 4. Alternative 4 - Architect-Engineer/Construction Manager
Converted to Privatized Design/Build/Operate.

Revision 2
07/08/94

LLWVP Project Primary Acquisition Plan

LLWVP Project Primary Acquisition Plan

Figure 5. Alternative 5 - Qualification Based Architect-Engineer for Conceptual Design then Competitive, Fixed-Price Design/Build with Performance Guarantees.

Revision 2
07/08/94

Figure 9. Alternative 9 - Two or More Subcontractor Teams and Competitive, Fixed-Price Proposals Including Design Concepts.

1

1

This page intentionally left blank.

OCT 17 1994
35

ENGINEERING DATA TRANSMITTAL

Page 1 of 1
1. EDT 606353

2. To: (Receiving Organization) Low-Level Waste Vitrification Plant Project Office		3. From: (Originating Organization) Low-Level Waste Vitrification Plant Project Office		4. Related EDT No.: N/A	
5. Proj./Prog./Dept./Div.: LLWVP Project/TWRS		6. Cog. Engr.: P. Felise/J. D. Phillips		7. Purchase Order No.: N/A	
8. Originator Remarks: The final report is being issued to document the Project records as to the recommended contracting strategy for the LLWVP Project. This strategy was <u>not</u> implemented due to parallel and independent DOE-HQ efforts to privatize this work along with other TWRS activities. The report should be useful to other projects and activities embarking on a Major System Aquisition of the nature of the LLWVP Project.				9. Equip./Component No.: N/A	
				10. System/Bldg./Facility: N/A	
11. Receiver Remarks: N/A				12. Major Assm. Dwg. No.: N/A	
				13. Permit/Permit Application No.: N/A	
				14. Required Response Date: N/A	

15. DATA TRANSMITTED					(F)	(G)	(H)	(I)
(A) Item No.	(B) Document/Drawing No.	(C) Sheet No.	(D) Rev. No.	(E) Title or Description of Data Transmitted	Approva l Desig- nator	Reaso n for Trans mitta l	Origi - nator Dispo - sition	Receiv - er Dispo sition
1	WHC-SD-W378-SP-001		0	Low-Level Waste Vitrification Plant (LLWVP) Project Contracting Strategy Decision Analysis Report	Q	1	1	1

16. KEY		
Approval Designator (F)	Reason for Transmittal (G)	Disposition (H) & (I)
E, S, Q, D or N/A (see WHC-CM-3-5, Sec.12.7)	1. Approval 4. Review 2. Release 5. Post-Review 3. Information6. Dist. (Receipt Acknow. Required)	1. Approved 4. Reviewed no/comment 2. Approved w/comment 5. Reviewed w/comment 3. Disapproved w/comment6. Receipt acknowledged

(G)	(H)	17. SIGNATURE/DISTRIBUTION (See Approval Designator for required signatures)						(G)	(H)
Rea - son	Dis p.	(J) Name	(K) Signature (M) MSIN	(L) Date	(J) Name	(K) Signature (M) MSIN	(L) Date	Rea - son	Dis p.
1	1	Cog.Eng. J. D. Phillips		10/16/94	Geo-06				
1	1	Cog. Mgr. P. Felise		10/16/94	Geo-06				
1	1	QA D. W. Duncan		10/16/94	Geo-07				
		Safety							
		Env.							

18. Signature of EDT Date Originator 10/16/94		19. Authorized Representative Date for Receiving Organization 10/16/94		20. Cognizant Manager Date 10/16/94		21. DOE APPROVAL (if required) Ctrl. No. ☐ Approved ☐ Approved w/comments ☐ Disapproved w/comments	
---	--	--	--	---	--	---	--

DISTRIBUTION SHEET

To Distribution	From Low-Level Waste Vitrification Plant Project Office	Page 1 of 1
		Date October 6, 1994
Project Title/Work Order Low-Level Waste Vitrification Plant Project Contracting Strategy Decision Analysis Report		EDT No. 606353
		ECN No.

Name	MSIN	Text With All Attach.	Text Only	Attach./ Appendix Only	EDT/ECN Only
------	------	-----------------------------	-----------	------------------------------	-----------------

Westinghouse Hanford Company

L. R. Burks	G6-14	X
J. D. Phillips	G6-06	X
Central Files (orig. +2)	L8-04	X
DPC-2 (2) 1	G6-51	X
OSTI (2)	L8-07	X