page 1 of 2

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A. Information Category

- [ ] Abstract
- [ ] Journal Article
- [ ] Summary
- [ ] Internet
- [ ] Visual Aid
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B. Document Number HNF-2031 - FP

C. Title

Licensing Strategy for Deployment of Commercial Technologies Procured Through a Service Contract in DOE-Owned Facilities

D. Internet Address john_w_bloom@rl.gov

E. Required Information

1. Is document potentially Classified? [x] No [ ] Yes (MANDATORY)

Carole E. Leach 4/28/98
Manager's Signature Required

If Yes _____ [ ] No [ ] Yes Classified
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F. Complete for a Journal Article

1. Title of Journal

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1. Title for Conference or Meeting 1998 Safety Analysis Workshop
2. Group Sponsoring Safety Analysis Working Group DOE Energy Facility Contractors Group
3. Date of Conference June 15-19,1998
4. City/State Park City, Utah
5. Will Information be Published in Proceedings? [ ] No [x] Yes
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H. Author/Requestor

John W. Bloom
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Responsible Manager

Carole Leach Carole E. Leach 4/28/98
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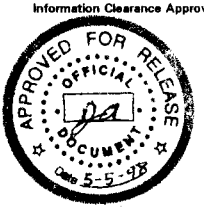

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	Yes	Print	Signature	Public Y/N (If N, complete J)
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Other	☐			Y / N
Other	☐			Y / N

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Licensing Strategy for Deployment of Commercial Technologies Procured Through a Service Contract in DOE-Owned Facilities

Prepared for the U.S. Department of Energy

Fluor Daniel Hanford, Inc.
Richland, Washington

Hanford Management and Integration Contractor for the
U.S. Department of Energy under Contract DE-AC06-96RL13200

Approved for Public Release; Further Dissemination Unlimited

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J. W. Bloom
DE&S Hanford, Inc.

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Safety Analysis Working Group DOE Energy Facility Contractors Group
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RELEASE AUTHORIZATION

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Document Title:	Licensing Strategy for Deployment of Commercial Technologies Procured Through a Service Contract in DOE-Owned Facilities

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Licensing Strategy for Deployment of Commercial Technologies Procured Through a Service Contract In DOE-Owned Facilities

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INTRODUCTION

The U.S. Department of Energy's Hanford Tank Farm Remediation System (TWRS) is responsible for the safe storage of waste in 177 underground waste storage tanks. TWRS is also responsible for the cleanup and final closure of these tanks. In the performance of this mission TWRS has historically designed its own equipment. The safety of the equipment for deployment in TWRS facilities has been assured through the development of detailed engineering specifications and close QA/QC monitoring during fabrication and testing. In order to address the complex and costly cleanup mission, Hanford is looking for ways to apply private sector technologies to the cleanup mission.

The Hanford Tanks Initiative (HTI) is a five year, EM 30/50 expense-funded project with a primary objective of demonstrating the extent to which the Hanford Tank Waste Remediation System (TWRS) tanks can be cleaned using commercially available technologies. To accomplish this objective, in August 1996 HTI issued a Request for Proposal (RFP) for services to remove the hard heel waste from tank 241-C-106, following retrieval of the majority of the waste by sluicing. While certain specification guidance was provided in the RFP such as, "must be capable of operation in a flammable gas environment," the RFP was careful in avoiding language that would place limitations on the technologies that industry could provide.

The challenge for HTI was to develop a licensing strategy that would provide maximum flexibility to the technology vendors while meeting the stringent documentation requirements of the U.S. Department of Energy (DOE). This strategy must also provide assurance that the technology can be shown to be within the TWRS authorization basis and be safely deployed. A 35-step process (Figure 1) was developed by HTI to accomplish this objective.

Bid and Award

DOE requires that all procurements be assigned a safety classification. For TWRS designed equipment or components this is easily accomplished by evaluation of the approved design. However, for procurement of a service, e.g., remove residual waste from a tank, which will deploy vendor provided equipment and processes in TWRS tanks, there was no established

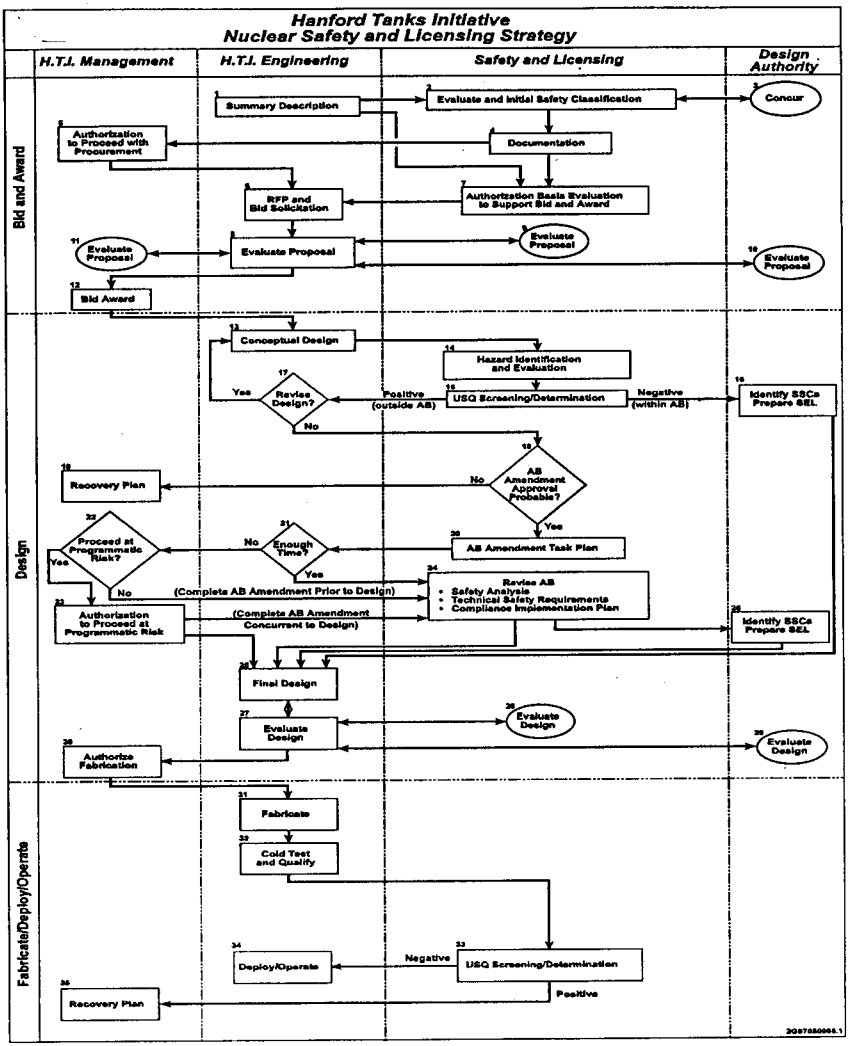
Hanford Tanks Initiative
Nuclear Safety and Licensing Strategy
H.T.I. Management
H.T.I. Engineering
Safety and Licensing
Design Authority
Bid and Award
Design
Fabricate/Deploy/Operate
1 Summary Description
2 Evaluate and Initial Safety Classification
3 Concur
4 Documentation
5 Authorization to Proceed with Procurement
6 RFP and Bid Solicitation
7 Authorization Basis Evaluation to Support Bid and Award
8 Evaluate Proposal
9 Evaluate Proposal
10 Evaluate Proposal
11 Evaluate Proposal
12 Bid Award
13 Conceptual Design
14 Hazard Identification and Evaluation
15 USQ Screening/Determination
16 Identify SSCs Prepare SEL
17 Revise Design?
Yes
No
Positive (outside AB)
Negative (within AB)
18 AB Amendment Approval Probable?
No
Yes
19 Recovery Plan
20 Proceed at Programmatic Risk?
Yes
No
21 Enough Time?
No
Yes
22 AB Amendment Task Plan
23 Authorization to Proceed at Programmatic Risk
(Complete AB Amendment Prior to Design)
(Complete AB Amendment Concurrent to Design)
24 Revise AB
• Safety Analysis
• Technical Safety Requirements
• Compliance Implementation Plan
25 Identify SSCs Prepare SEL
26 Final Design
27 Evaluate Design
28 Evaluate Design
29 Evaluate Design
30 Authorize Fabrication
31 Fabricate
32 Cold Test and Qualify
33 USQ Screening/Determination
Negative
Positive
34 Deploy/Operate
35 Recovery Plan
3G97080066.1

Figure 1

procedure for assigning a safety classification. An overly conservative classification on the procurement documentation would result in significant cost and schedule escalation. An overly liberal classification could result in the vendor providing a system that may require major design and fabrication rework if the equipment is later determined to have components that are safety class (SC) or safety significant (SS). This undesirable situation could also result in expensive and protracted litigation with serious programmatic impacts. The licensing strategy developed for HTI generates a defensible safety classification for the procurement action by applying traceable engineering judgement to the suite of technologies that could be utilized to perform the service.

The initiator of the procurement provides a summary description of the procurement (Step 1) which will include:

- Purpose and scope;
- Background information;
- Description of possible equipment to be deployed (based on engineering judgement) including any safety features;
- Description of associated operations and/or planned work activities and how the equipment will be used; and
- List of related documents, studies, or other relevant references

Using the summary description as the basis, the facility licensing group evaluates the potential system(s) against the authorization basis to establish an initial safety classification for the procurement action (Step 2). The design authority reviews this evaluation and must concur with the initial safety classification (Step 3). The summary description and evaluation are documented in an auditable fashion. The documentation will include any special design features or conditions that are not described in the summary description, which the licensing group deems necessary to assure compliance with the authorization basis (Step 4). This step is crucial as it is here that safety class and/or safety significant features are identified. Management bases its authorization to proceed with the RFP on this documentation (Step 5).

Engineering is responsible for preparing the RFP (Step 6) and for insuring that it includes all relevant authorization basis requirements. The inclusion of authorization basis requirements allows the evaluation of bid packages to be based on the level of compliance to the authorization basis. The potential equipment (Step 1) is evaluated using the unreviewed safety question (USQ) screening/determination process (Step 7). Employing the USQ screening/determination methodology at this time serves two purposes. First, it assures that bid specifications include relevant authorization basis requirements. Second, if the evaluation identifies that the probable commercial equipment and activities are likely to be outside the authorization basis, the program has adequate time to plan for an authorization basis amendment.

Once the proposals are received, a team consisting of representatives from management,

procurement, licensing, engineering, and the design authority reviews them. Engineering has the lead for evaluating the bid packages (Step 8). This responsibility includes incorporation of review comments from safety and licensing, the design authority, and project/program management. Licensing evaluates the bid packages against the authorization basis (Step 9). The licensing evaluation determines if the proposals meet or could meet the existing authorization basis. This evaluation also provides a judgement on the relative ease of obtaining authorization basis approval for the competing proposals. The design authority evaluation (Step 10) ensures that the potential impacts of the proposals on the authorization basis have been assessed and that an adequate technical basis exists for the proposed equipment and activities. The management review (Step 11) assures that the overall programmatic goals and expectations can be met by the proposals. Based on the results of these evaluations, the contract is awarded (Step 12).

Design

A conceptual design (Step 13) for the successful bidder's equipment and processes is prepared as the basis for an early hazard identification and evaluation. This conceptual design is based on the best and final proposal and is to include preliminary descriptions of activities, equipment, facility upgrades, processes, and procedures that are required but not identified in the proposal.

Once the contract has been awarded and the proposed technology is known, it is important to identify any additional hazards it may present as early as possible and evaluate them against the facility authorization basis. At this time the hazards associated with the deployment, operation, and removal of the equipment described in the proposal are identified using a standard hazards and operability study (HAZOP) or preliminary hazard analysis (PHA) process. The hazard evaluation team should consist of an experienced hazard evaluation facilitator, a vendor representative, a design authority representative, and a representative familiar with plant operations. The hazard evaluation team documents the results of the evaluation in a Hazard Identification and Evaluation (HI&E) report (Step 14). Using the hazards documented in the HI&E, a USQ screening/determination is prepared (Step 15). The purpose at this point is to project how the proposed equipment and process will look in the authorization basis. Because the detailed design may not be complete at this time, the HI&E and USQ processes can provide valuable information to help make, or change, some vendor design decisions. A negative USQ evaluation (i.e., the equipment and/or process are bounded by the authorization basis) would result in a request to the design authority to identify the structures, systems, and components (SSCs) and prepare a preliminary safety equipment list (Step 16). The design authority identifies the SSCs associated with the proposal and related facility equipment and assigns safety classifications to them. This permits the vendor to refine the design requirements for the safety SSCs early in his design process.

A positive USQ determination (i.e., the equipment and/or process are not bounded by the authorization basis) would identify possible areas for design modification or alternately, provide input to an authorization basis amendment. A positive USQ determination would be reviewed with the vendor to determine if the design could be modified so that a negative USQ

determination could be achieved. As an alternative the government contractor could elect to modify the authorization basis to incorporate the design.

Assuming an authorization basis amendment is required, the licensing engineer would first determine if the amendment is likely to be approved (Step 18). This determination would consider factors such as the nature of the technology and its use under related circumstances and an assessment of the expected regulator reaction to a request to amend the authorization basis for this technology. If approval of an amendment were judged to be probable, the amendment activities would be started. If approval of the amendment is judged to be unlikely, management is informed so a recovery plan can be prepared. The recovery plan would be developed jointly by staff from facility engineering, licensing, and the vendor (Step 19) with the objective of identifying changes to the design that either would not require an authorization basis amendment or require an amendment for which approval is judged to be likely. The recovery plan requires approval by project management.

If the decision is made to amend the authorization basis, the first step is to prepare an authorization basis amendment task plan (Step 20) defining the scope of work, resource requirements, preparation and review responsibilities, and a schedule for the authorization basis amendment package. The task plan, prepared by the licensing organization, includes the acceptance criteria by which the final product will be judged.

Engineering and the vendor review the authorization basis amendment task plan to determine if the schedule for deployment of the technology is sufficient to allow approval of the amendment prior to completion of the design. This allows the design to incorporate the requirements identified in the approved safety analysis. If sufficient time is available, the authorization basis is amended and approved prior to starting additional design activities (Step 24). If sufficient time is not available, management must decide if they are willing to accept the programmatic risk of completing the design in parallel with the safety analysis activities (Step 22).

The safety analysts provide to management their judgement on the level of complexity of the amendment and likelihood that additional significant safety issues may be uncovered. Management balances this input with the project programmatic impacts of waiting for the analysis to be complete prior to resuming design activities. Management then decides if they will permit design to proceed in parallel with the safety analysis. If management decides that the level of programmatic risk in not acceptable, they will direct the completion of the amendment package prior to authorizing resumption of design activities.

If management is willing to accept the programmatic risk, they will formally authorize completion of the design by the vendor in parallel with the safety analysis effort (Step 23). The vendor is fully briefed by the analysts on the probable constraints that the analysis may place on their design.

The authorization basis is amended in accordance with the authorization basis amendment task plan (Step 24). The Technical Safety Requirements (TSRs) are prepared and, if necessary, a compliance implementation plan is prepared.

When the authorization basis amendment is completed, the design authority identifies and assigns classifications to the SSCs and prepares the safety equipment list (SEL) (Step 26). At this point facility engineering conducts a review of the comments from safety and licensing and the design authority, evaluates the design and makes a recommendation to management regarding release of the vendor to proceed with fabrication (Step 27). The evaluations are performed against the amended authorization basis to determine if its use in the facility can be approved. Upon receiving a favorable recommendation from engineering, management can approve the vendor to proceed with final design and fabrication (Step 30).

Fabrication, Deployment and Operations

Once facility management has granted approval, the vendor can proceed with the fabrication/modification of his equipment (Step 31). Facility engineering is responsible for developing the testing and qualification requirements to provide assurance that the equipment, processes and procedures are in compliance with facility requirements prior to deployment and operation (Step 32).

A final USQ screening/determination is conducted prior to deployment to assure that the equipment and procedures adequately reflect the authorization basis requirements (Step 33). Following a negative screening/determination the equipment is authorized for deployment (Step 34). In the event that this screening/determination is positive, a recovery plan is developed (Step 35).