ENCLOSURE 3

List of Applicable KTI Agreements
Alternative Conceptual Models, Model Abstractions, and Parameter Uncertainty

KTI #	NRC/DOE Agreement *NOTE: The agreement text is verbatim from the Summary Highlights for the TSPAI and Range of Thermal Operating Ranges Technical Exchanges August 2001. Thus, references to future revisions to a specified project document may no longer be applicable. In all cases, documentation that addresses each agreement will be in the specified or other project document.*	Corresponding Section of the Guidelines
TSPAI 3.38	DOE will develop written guidance in the model abstraction process for model developers so that (1) the abstraction process, (2) the selection of conservatism in components, and (3) representation of uncertainty, are systematic across the TSPA model. These guidelines will address: (1) evaluation of non-linear models when conservatism is being used to address uncertainty, and (2) use of decisions based on technical judgement in a complex system. These guidelines will be developed, implemented, and made available to the NRC in FY02.	Sections 2, 3 and 4 • Abstraction Process (Section 3.2) • Selection of conservatisms (Section 4.2) • Representation of uncertainty (Section 4.2) • Evaluation of non-linear models (Section 4.2) • Use of decisions based on technical judgment (Section 4.2)
TSPAI 3.39	DOE will document the simplifications used for abstractions per TSPAI 3.38 activities for all future performance assessments. Justification will be provided to show that the simplifications appropriately represent the necessary processes and appropriately propagate process model uncertainties. Comparisons of output from process models to performance assessment abstractions will be provided, with the level of detail in the comparisons commensurate with any reduction in propagated uncertainty and the risk significance of the model. The documentation of the information will be provided in abstraction Analysis Model Reports (AMRs) in FY03.	Section 3 • Represent necessary processes (Section 3.2) • Propagation of uncertainties (Section 3.2) • Comparison of output from process models (Section 3.2, AP-SIII.10Q) • Documentation of information in model reports (Section 3.2) (Note: These guidelines provide the methodology for implementing this KTI agreement. Documentation, justification, and comparisons will be provided in the respective model reports)
TSPAI 3.40	DOE will implement program improvements to ensure that the abstractions defined in the AMRs are consistently propagated into the TSPA, or ensure that the TSPA documentation describes any differences. Program improvements may include, for example, upgrades to work plans, procedural upgrades, preparation of desktop guides, worker training, increased review and oversight. The program improvements will be implemented and made available to the NRC during FY02.	Section 3 • Implement program improvements (Section 3.2) • Ensure TSPA documentation documents differences (Section 3.2) • Program improvements (Section 3.2)
TSPAI 3.41	DOE will provide the technical basis for the data distributions used in the TSPA to provide support for the mathematical representation of data uncertainty in the TSPA. The documentation of the technical basis will be incorporated in documentation associated with TSPA for any potential license application. The documentation is expected to be available to NRC in FY03.	Section 4 • Provide technical basis (Section 4.2) • Support mathematical representation of uncertainty (Section 4.2) (Note: These guidelines provide the methodology for implementing this KTI agreement. Documentation will be provided in the respective model reports)

ENCLOSURE 1
List of Applicable KTI Agreements
Alternative Conceptual Models, Model Abstractions, and Parameter Uncertainty

KTI #	NRC/DOE Agreement *NOTE: The agreement text is verbatim from the Summary Highlights for the TSPAI and Range of Thermal Operating Ranges Technical Exchanges August 2001. Thus, references to future revisions to a specified project document may no longer be applicable. In all cases, documentation that addresses each agreement will be in the specified or other project document.*	Corresponding Section of the Guidelines
TSPAI 4.01	DOE will document the methodology that will be used to incorporate alternative conceptual models into the performance assessment. The methodology will ensure that the representation of alternative conceptual models in the TSPA does not result in an underestimation of risk. DOE will document the guidance given to process-level experts for the treatment of alternative models. The implementation of the methodology will be sufficient to allow a clear understanding of the potential effect of alternative conceptual models and their associated uncertainties on the performance assessment. The methodology will be documented in the TSPA–LA methods and assumptions document in FY02. The results will be documented in the appropriate AMRs or the TSPA for any potential license application in FY03.	Section 2 • Incorporate alternative conceptual models (Section 2.2) • Does not result in an underestimation of risk (Section 2.2) • Document guidance on treatment of alternative conceptual models • (Section 2.2) • Potential effects of alternative conceptual models and associated uncertainties (Section 2.2) • Documentation in TSPA–LA (Section 2.2)
GEN 1.01	GENERAL.1.01 - For NRC comments 56, 78, 96 and 120, DOE will address the concern in the DOE response. The schedule and document source will be the same as the specific KTI agreement. (paraphrased by DOE for brevity)	See specific agreement items below
GEN 1.01, Item 56	Page 2-1: "There are also cases where more than one conceptual model may be consistent with available data and observations. In the absence of definitive data or compelling technical arguments for a specific conceptual, process or abstracted model, a conservative representation was chosen." It is unclear what the criteria were to determine when a conservative selection was necessary. In the saturated zone modeling, there is evidence to suggest anisotrophy and isotropic conditions. These states were equally weighted in the TSPA model which is inconsistent with the language highlighted above. Clarification of the DOE position on alternative conceptual models needed. (DOE) The statement is generally true across inputs to the performance assessment. In most cases, the implications of alternative conceptual models are evaluated using "one-off" sensitivity analyses, presented in Section 3 of Volume 2 of the SSPA. In a few cases, alternative conceptual models are propagated through the performance assessment. Note that Agreement TSPAI 4.01 covers the treatment of alternative conceptual models. Alternative conceptual models are screened out during the process model calibration. Sensitivity analysis are completed to investigate the effects of alternative conceptual models on the SZ flow field, specific discharge and radionuclide transport. In addition alternative conceptual models are documented in the SZ PMR and its revisions.	Section 2 • Incorporate alternative conceptual models (Section 2.2) • Does not result in an underestimation of risk (Section 2.2) • Document guidance on treatment of alternative conceptual models • (Section 2.2) • Potential effects of alternative conceptual models and associated uncertainties (Section 2.2) • Documentation in TSPA–LA (Section 2.2)
GEN 1.01, Item 78	Page 3-6: "Uncertainties are addressed by bounding and sensitivity studies as discussed in DOE 2001..." Sensitivity studies can be an effective mechanism to assess uncertainties, however if the uncertainties show up as contributing to the output then they must be represented in the abstraction to the TSPA. DOE acknowledges this concern, and will address specific, relevant issues according to KTI agreement TSPAI 3.38.	Sections 2, 3 and 4 • Abstraction Process (Section 3.2) • Selection of conservatisms (Section 4.2) • Representation of uncertainty (Section 4.2) • Evaluation of non-linear models (Section 4.2) • Use of decisions based on technical judgment (Section 4.2)

ENCLOSURE 1
List of Applicable KTI Agreements
Alternative Conceptual Models, Model Abstractions, and Parameter Uncertainty

KTI #	NRC/DOE Agreement *NOTE: The agreement text is verbatim from the Summary Highlights for the TSPAI and Range of Thermal Operating Ranges Technical Exchanges August 2001. Thus, references to future revisions to a specified project document may no longer be applicable. In all cases, documentation that addresses each agreement will be in the specified or other project document.*	Corresponding Section of the Guidelines
GEN 1.01, Item 96	Page 4-56: The analytical work is an excellent example of alternative methods that can be pursued as multiple lines of evidence. However, in this case it does raise additional technical questions. For example, would the chemistry of the solution in the above boiling region influence the behavior? In particular, if the solution were a chlorine-brine would it have different physical characteristics than dilute water? Secondly, if 15% of the realizations predicted penetration, then roughly 1600+ waste packages (on average) should experience these conditions. Finally, where is the support for the original modeling result if the analytical result contradicts the conclusions made with the original model? Page 4-57 describes "more extreme conditions," but it was not obvious that the conditions were more extreme in the analytical work, rather it appeared that the analytical work evaluated processes on a scale that the numerical model can not evaluate. (DOE) Although the asperity-induced episodic infiltration model provides convenient analytical expressions for the episodicity and water-penetration distances, it also includes a number of important assumptions (consistent with KTI agreement TSPAI 4.01):…..	Section 2 • Incorporate alternative conceptual models (Section 2.2) • Does not result in an underestimation of risk (Section 2.2) • Document guidance on treatment of alternative conceptual models • (Section 2.2) • Potential effects of alternative conceptual models and associated uncertainties (Section 2.2) • Documentation in TSPA–LA (Section 2.2)
GEN 1.01, Item 120	Page 7-11: The use of triangular distribution for the residual stress uncertainty dictates that the endpoints of the distribution are well known. Showing the data compared to the distribution would support the selection of a triangular distribution. (DOE) A triangular distribution is used to represent uncertainty in the residual stress and stress intensity factor profiles in the weld regions of the outer and inner closure lids of the waste package Alloy 22 outer barrier. The triangular distribution was used because the uncertainty bounds used are conservative, considering the strict process control and inspections that will be implemented during the waste package manufacturing process. If the data currently being obtained under existing CLST 1.12 and 1.13 warrant a change in the assumed distribution, this would be carried forward into a potential TSPA-LA in accordance with KTI agreement TSPAI 3.41.	Section 4 • Provide technical basis (Section 4.2) • Support mathematical representation of uncertainty (Section 4.2) (Note: These guidelines provide the methodology for implementing this KTI agreement. Documentation will be provided in the respective model reports)

OFFICE OF CIVILIAN RADIOACTIVE WASTE MANAGEMENT
REGULATORY RESPONSE REVIEW RECORD

QA: NA

Project:	Department/Group:
LAP	PASS/NRC Reg. Coordination Group

1. Initiating Reference (e.g., E-mail, telephone call, verbal request, DOE/NRC meeting, letter from NRC, other government agency or client):

KTI Agreements TSPAI 3.38, 3.39, 3.40, 3.41, 4.01 and GEN 1.01 Items 56, 78, 96, 120

2. Scope and Description of Issue (Problem statement and key elements of the response: facts, discussion, intended actions, or BSC position):

Guidelines document issued to address treament of alternative conceptual models , model abstractions and parameter uncertainty

3. Documents Used in Response Development (e.g., specifications, drawings, calculations, studies, etc.):

SSPA Vols 1& 2, TSPA-FEIS, TSPA-SR

4. Originator:	Date:	5. Reviewer:	Date:
Jerry McNeish	4.22-02	Peter Swift	4/22/02

6. CONCURRENCE

Science and Analysis		Functional Staff		Other	
Project Manager: Bob Andrews	Date: 4/23/02	Engineering:	Date:		Date:
		Chief Science Officer:	Date:		Date:
Repository Design					
Project Manager:	Date:	Quality Assurance:	Date:		
Program Integration					
Manager:	Date:				

7. APPROVALS

Project Manager:	License Application Project SME:	Project Manager, License Application Project:
Peter Swift	Veronica Cornell	Steve Cereghino