

Y-RAR-H-00065

Revision 1

**LIQUID WASTE ORGANIZATION
LIQUID WASTE DISPOSITION PROJECTS**

SALT PROCESSING PROJECTS

Project #G-002 Tank 48 Treatment Process (TTP)

Risk Analysis Report

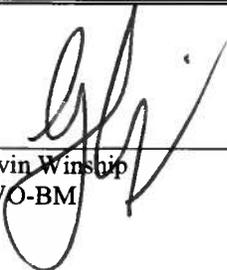


Washington Savannah River Company
Savannah River Site
Aiken,

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Prepared by:

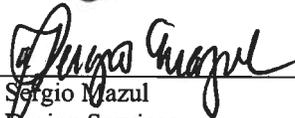


Gavin Winslip
LWO-BM

10/14/08

Date

Approved by:



Sergio Mazul
Design Services

12/18/08

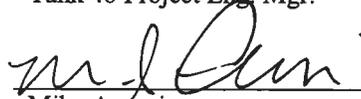
Date



Caroline Atseff
Tank 48 Project Eng. Mgr.

10/29/08

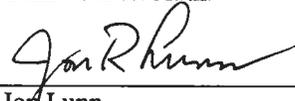
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Mike Augeri
Tank 48 Des. Auth.

10/21/08

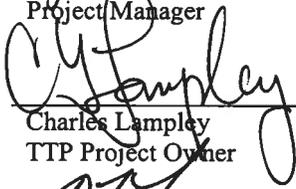
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Jon Lunn
Project Manager

11/14/08

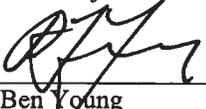
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Charles Lampley
TTP Project Owner

11/19/08

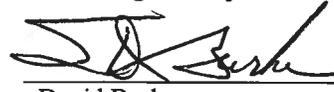
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Ben Young
LWO-Mgr of Projects

11/20/08

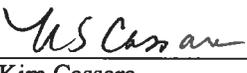
Date



David Burke
LWO-Des. Auth. Eng Mgr

12/3/08

Date



Kim Cassara
Director, PD&CS

12/15/08

Date



Kim Hauer
LWO-Operations Mgr

12/18/08

Date



Neil Davis
Area Projects Manager

12/18/08

Date

SUMMARY OF REVISIONS

<u>Issue Date</u>	<u>Revision</u>	<u>Description</u>
11/20/06	0	Initial Issue
10/14/08	1	General revision, incorporating updated risk data, no change bars used.

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EXECUTIVE SUMMARY

Liquid Waste Operations (LWO) is tasked with the removal and disposition of Salt currently stored within High Level Waste (HLW) tanks at SRS. To accomplish this task the Life-cycle Liquid Waste Disposition System Plan (LLWDSP) (Reference 4) was developed which, during its implementation, will generate several projects. A Program Risk Assessment (Reference 1) was prepared to address the overall risks associated with LLWDSP implementation.

This risk and opportunity assessment report (ROAR) addresses risks and opportunities associated with one of the LLWDSP projects, namely the Tank 48 Treatment Process (TTP) Project. This ROAR presents the risks and levels of risk associated with this Project, the risk handling strategies (RHSs) to be employed, the residual risk remaining and provides a basis for a Technical and Programmatic Risk Assessment (T&PRA) contingency estimate.

The initial issuance of this report was used as a basis for development of a conceptual estimate in support of CD-1. During the execution of this scope, documented risks were statused, RHSs tracked and new risks added as they were identified. As significant strategy changes have taken place since the commencement of work after CD-1, the Project Team has initiated a mid-execution re-validation of EAC prior to completion of the current project stage. The risk data developed since CD-1 were reviewed by the TTP Project Team and then a brainstorming approach was used to identify any additional risks or opportunities which were then validated and handling strategies developed.

A total of 63 risks were validated. These comprised of 29 high, 25 moderate, and 3 low Project risks, 4 LLWDSP issues and two operational vulnerabilities. Risk handling strategies were developed for all risks.

After application of the RHSs, 54 risks will be reduced or mitigated, 4 risks will be accepted and 5 risks will be avoided. The resulting handled risks that would remain open with the potential to impact the project, based on the worst case impact assessed by the Team comprised of 4 high risks, 16 moderate risks 25 low risks, and 8 risks that if realized would require a BCP to be initiated.

One opportunity was validated and a handling strategy developed to maximize the benefit to the TTP Project.

The residual risk levels were analyzed using Crystal Ball[®] software to perform a Monte Carlo analysis. As with the previous estimate, an estimate range was established with the low BDER excluding the risks of additional safety controls, the high BDER with those controls included. It was concluded that at an 80% probability of project success would require a low BDER T&PRA contingency of 4.1 million dollars, given that any realization of risk leading to the introduction of additional safety controls in the design would result in the change control process being used to fund those additional costs within the limits documented within the high BDER estimate.

ABBREVIATIONS and ACRONYMS

BCP –Baseline Change Proposal
BDER – Business Decision Estimate Range
CAB – Citizens Advisory Board
DOE – Department of Energy
DOE – HQ – Department of Energy Headquarters
DNSFB – Defense Nuclear Facilities Safety Board
DSA - Documented Safety Analysis
DWPF – Defense Waste Processing Facility
FBSR – Fluidized Bed Steam Reforming
GAC – Granular Activated Charcoal
HLW – High Level Waste
HTF – H-Area Tank Farm
ITP – In-Tank Precipitation
IWT – Industrial Waste Treatment
LWDPP – Liquid Waste Disposition Processing Plan
LWO – Liquid Waste Operations
RHS – Risk Handling Strategy
SCDHEC – South Carolina Department of Health and Environmental Control
SRS – Savannah River Site
SRNL – Savannah River National Laboratories
SSF – Saltstone Facility
T&PRA – Technical and Programmatic Risk Assessment
TPB –Tetraphenylborate
TR&C – Task Requirements and Criteria
TTP – Tank 48 Treatment Process
WAC – Waste Acceptance Criteria
WSMS – Washington Safety Management Solutions
WSRC – Washington Savannah River Company

1.0 OVERVIEW

The LWO is tasked with the removal and disposition of salt currently stored within HLW tanks at SRS. Successful disposal of salt waste will support a significant reduction in lifecycle cost while allowing accelerated waste tank closure and providing space gain in the Tank Farms to support operational flexibility. A program risk assessment (Reference 1) addresses the overall LLWDSP risks, while risks specific to the TTP Project will be addressed within this risk analysis report.

This risk analysis identifies risks RHSs that will be used to tailor an integrated risk handling strategy for the TTP Project. The RHSs align with the current LWDP risk management strategy outlined in Reference 6.

1.1 Project Description

Tank 48H currently contains approximately 240,000 gallons of salt solution containing 21,800 kilograms of potassium and cesium tetraphenylborate (TPB) salts generated during the 1983 In-Tank Precipitation (ITP) Process demonstration and the subsequent operation of the ITP facility in 1995/1996. The organic nature of TPB salts makes the Tank 48H waste incompatible with the existing HLW Treatment and Disposition facilities. In order to meet organic requirements in the current Documented Safety Analysis (DSA), which limit the amount of TPB that can remain in the tank when returned to service and due to the need for additional HLW storage, successful disposition of the material in Tank 48H is essential.

Evaluation of alternative methods for disposition of the TPB in consideration with the salt strategy resulted in the selection of a FBSR process. A detailed description of the conceptual scope of the TTP Project is contained within Reference 2.

2.0 RISK MANAGEMENT PROCESS

2.1 Background

A program risk assessment is maintained for the LLWDSP. This risk assessment was conducted at a higher level and addressed risks in terms of their consequences to the implementation of the LLWDSP (Reference 4). This risk assessment is documented in Reference 1.

The LWO conducts risk assessments on each of the LLWDSP projects. This risk report provides the results of the TTP Project assessment and will be periodically updated to incorporate updated information. The Project Team may add additional risks to the matrix prior to any re-issuance of a report. This will allow timely evaluation of the risk and ensure risk handling strategies are developed as needed.

2.2 Team Members

As a minimum the Team consists of the following personnel:

Charles Lampley	Project Owner
Jon Lunn	Project Manager
Mike Augeri	Design Authority
Caroline Atseff	Project Eng. Manager
Sam Shah	Design Authority
Sergio Mazul	Design Services
Mary Pallon	Construction

During the course of the risk assessment representatives from other contributing organizations were requested to provide input for a specific set of risks or requested to sit on the team during the assessment meeting.

2.3 Risk Assessment Process and Methodology

The risk assessments are conducted by formal meetings using a structured format to implement the risk assessment methodologies outlined in Reference 5. The major steps of the process are assessment, analysis and tracking which are shown in steps 1 through 7.

Assessment

1. Identification of risks

The risk identification process is performed in a brainstorming session with the team or by developing functions of the process and identifying the risks associated with each function. To assist risk identification a Risk Topics sheet (Appendix 6.1) that identifies risk typical types by area can be used. Each identified risk is documented on a Risk Assessment Form (Appendix 6.5). Each has a documented basis, event and risk description to allow a full understanding of the risk.

2. Assignment of Probability, Consequences and Determination of the Risk Level

The probability of risk occurrence is selected from the Risk Probabilities Table (Appendix 6.2) and a basis for the probability documented on the Risk Assessment Form. The consequences (schedule impact and cost impact) of the risk occurring is then determined by the Team and the corresponding consequence identifier assigned from the Risk Consequences Table (Appendix 6.3) and a basis for the consequences documented on the Risk Assessment Form. The probability and consequences are used in conjunction with Risk Level Matrix (Appendix 6.4) to determine the risk level.

3. Identification of risk handling strategy

A risk handling strategy (RHS) will normally be developed for all moderate and high level risks, and may be developed for other risks at the discretion of the Project Team. The risk handling strategy will be documented on the Risk Assessment Form along with the person responsible for execution of the RHS and where required by the Project Owner, the cost and schedule to implement the RHS. The following RHSs types may be employed:

Avoid – This strategy focuses on totally eliminating the specific risk-driving event. Once the RHS is implemented the risk will be reduced to zero, no residual risk remains with this strategy

Reduce – This strategy identifies specific steps or actions to reduce the probability of the occurrence of the risk. There will be residual risk after the implementation of this RHS.

Mitigate – This strategy identifies specific steps or actions to reduce the consequence of the risk. There will be residual risk after the implementation of this RHS.

Reduce/Mitigate – A combination of Reduce and Mitigate. There will be residual risk after the implementation of this RHS.

Accept – Accepting a risk is essentially a “no action” strategy. Selection of this strategy is based upon the decision that it is more cost effective to continue the activity as planned with no resources specifically dedicated to addressing the risk. The residual risk is equal to the initial risk with this RHS.

4. Determination of residual risk

If a reduce, mitigate or reduce/mitigate RHS is employed, there will be residual risk remaining after the RHS is complete. This residual risk is estimated and entered on the Risk Assessment Form as quantified cost and/or schedule impact with an associated probability of occurrence. This residual risk can be used to calculate the total

risk abated by a particular RHS.

Analysis

5. Developing risk handling priorities

Based on individual Project needs, RHS priorities may be required to allow selection of RHSs for implementation. This may occur when or constrained by resources. RHSs may be prioritized based on cost or risk abated. The total cost of all RHSs is used as a baseline to normalize each RHS cost. Similarly the total risk abated (the sum of initial risk minus the residual risk for all RHSs) is used as a baseline to normalize each RHS risk abated.

The risk abated per unit cost can be calculated from the normalized risk abated and cost data. Risk adverse and cost adverse models and RHS cost and risk adverse priority lists may also be created. At the Project Owner's discretion, risk may also be assigned a "type" and the risk type weighted and used to create a weighted RHS priority list. Prioritized RHSs listings and model tools may be used by the Project Owner to assist in the scheduling and reporting of RHS implementation and the alignment of risk trigger points for schedule activities. (Risk trigger points define points at which RHS must begin to allow successful risk mitigation or points at which risk may no longer be realized.)

6. Developing T&PRA contingency estimate

Based on the residual risk impacts identified by the Team, a cost probability distribution is developed for each risk using Crystal Ball[®] software. The software can then be used to statistically combine the distributions through a Monte Carlo process (random sampling methodology) to produce the (T&PRA) cost contingency estimate. The intent of the T&PRA cost contingency estimate is to identify the amount of contingency funding for the Project to ensure that, at an 80% confidence level, the Project is adequately funded and can survive the consequences of realized residual risk. Appendix 6.6 shows the probability distribution models for each of the risks, the frequency-probability profile for the combination of models and the percentiles within the output as they relate to the estimated contingency dollars (the percentile of interest being 80%).

Tracking

7. Risk Tracking

Risk tracking will be performed using risk trigger points and scheduled RHSs. Risk trigger points define the earliest point in the project life that the risk could be realized and the latest point at which the risk no longer can be realized. Risk triggers may be entered into the project schedule at the Project Owners discretion. As a minimum they will be used to update project risk status. Project risk status is depicted on a "risk-o-meter," (Appendix 6.7). The Project status of each risk is expressed as a "level of concern" which reflects a combination of the Project Team's confidence of handling and perceived severity level of the risk at the time of the "risk-o-meter" update. As new risks are identified and existing risks change, the Risk Assessment Forms and analysis (from items 5 and 6 above) will be updated prior to reporting project risk trends. Periodically the updated Risk Assessment Forms will be issued in a revision to this report.

Additional guidance for performance of Risk Assessments is found in Reference 3, WSRC Manual E11, Conduct of Project Management and Controls, Procedure 2.62, "Project Risk and Opportunity Analysis," and Reference 5, "Systems Engineering Methodology Guidance Manual."

2.4 Assumptions and Issues

Assumptions for the TTP Project are listed and discussed in detail within Reference 2. These assumptions were reviewed as part of this risk assessment and any risks associated with those assumptions identified and included in the risk data for the TTP Project.

The following issues were identified during this risk assessment:

1. Scale-up of FBSR Process Encounters Problems - LWDPP ISSUE (029)

Scale-up of the steam reforming process to treat Tank 48 could result in lower throughputs than planned in the design. The scale-up capacity from the Hazen unit to other designs has been performed in the past and is likely to be well understood however, and problems encountered could result in a delay in schedule for Tank 48 return to service. The inability of the scaled-up FBSR to meet throughput requirements is not considered a risk to the project, however this is an issue that could impact the LLWDSP. This issue was reviewed as part of the PBS-SR-0014 annual update process (Reference 1, Risk 122).

2. Availability Cannot be Achieved - LWDPP ISSUE (038)

The FBSR design assumes a 75% attainment. The FBSR process is a "first of a kind" for SRS. First of a kind processes usually have unanticipated attainment problems during startup and commissioning. Failure to achieve attainment will result in a longer processing period for Tank 48 contents. The inability of the FBSR to meet availability requirements is not considered a risk to the project, however this is an issue that could impact the LLWDSP. This issue was reviewed as part of the PBS-SR-0014 annual update process (Reference 1, Risk 122).

3. Tank Farm Equipment Failure - LWDPP ISSUE (050)

The successful processing of Tank 48 waste is dependent upon the ability of the HTF infrastructure to meet FBSR interface demands by having the required support systems and interfacing systems available when needed. If HTF systems are not available when required then processing cannot proceed. The interfacing systems and utilities are aged however; regular planned preventive maintenance is being performed to maximize their availability and reliability. The inability of the HTF infrastructure to meet availability and reliability requirements is not considered a risk to the Project, however this is an issue that could impact the LLWDSP. This issue was reviewed as part of the PBS-SR-0014 annual update process (Reference 1, Risk 011).

4. Project Does Not Support Tank 48 Return to Service Need - LWDPP ISSUE (062)

Tank 48 is required to be placed back in service to support the LLWDSP. The FBSR process is designed to be installed and process Tank 48 contents to allow the tank to be placed back into service. The current LLWDSP shows a need date of 2013 for Tank. 48 Return to Service. The TTP Project schedule range and operational duration may not support this date. If Tank 48 can not be returned to service to support the LLWDSP, future Tank Closure commitments may not be achieved. This is not a risk for the Project, however this is an issue that could impact the LLWDSP. This issue was reviewed as part of the PBS-SR-0014 annual update process (Reference 1, Risk 184).

3.0 RESULTS

The following update was performed to the TTP Project risks:

New Risks (13)

- 082 Organic Carries Over to Product Mix Tank
- 083 DWPF Processing Impacted by FBSR Product
- 085 Maintenance Requires Remote Operations

- 086 Depleted Uranium is Required to be Added Prior to Transfer to Tank Farm Receipt Tank
- 087 High Silica Content Creates a Processing Problem at 2H Evaporator
- 088 10 CFR 851 Implementation Delay
- 089 Technology Issues Make Deployment Impractical
- 090 Interim Standard 1189 Guidance Differs from Approved Standard
- 091 FHA Requires Separation from ARP that Results in Additional Project Scope
- 092 NESHAP Air Permit (Non-Rad) Exemption is not Possible
- 093 Accident Analysis Determines Additional Safety Controls are Required
- 094 Startup/Shutdown Creates Material for Which There is no Disposition path
- 095 Solids Formation in PMT

Closed (4)

- 017 Carbon in DMR Output Creates a Processing Problem at DWPF - Waste will not be transferred to Tank 51. Refer to Risk 83 for DWPF processing problems.
- 021 Preliminary Hazard Category 3 Facility Categorization Basis Is Not Acceptable – This risk has been realized by the Project.
- 048 10 CFR 851 Implementation Delay - The requirement to meet 10 CFR 851 has been written into the SOW/Procurement Specification for the vendor. The vendor is now required to fully comply with these requirements.
- 088 10 CFR 851 Implementation Delay - The requirement to meet 10 CFR 851 has been written into the SOW/Procurement Specification for the vendor. The vendor is now required to fully comply with these requirements.

Deleted (1)

- 091 FHA Requires Separation from ARP that Results in Additional Project Scope - This is no longer considered a risk as ARP will not be operating within 241-96H concurrently with TTP.

After the update, 63 risks remained (summarized in Appendix 6.5):

- 57 Project risks: 29 High, 25 Moderate and 3 Low risks
- Four LLWDSP issues discussed in Section 2.4 (risks 029, 038, 050 and 062)
- Two operational vulnerabilities (risks 046 and 75)

Risk handling strategies were developed for the 63 remaining risks as appropriate:

- Risks Reduced or Mitigated (54)
- Risk Avoided (5)
- Risks Accepted (4)

The resulting handled risks that would remain open with the potential to impact the project, based on the worst case impact assessed by the Team comprised of 4 high risks, 16 moderate risks, 25 low risks and seven risks that would, if realized, result in the generation of a BCP to the project (risks: 001, 007, 012, 015, 016, 030, 090 and 93). These eight risks were therefore not included in the T&PRA contingency calculation. See Table in Appendix 6.5 for a summary of results.

The residual risk levels were analyzed using Crystal Ball[®] software to perform a Monte Carlo analysis. As with the previous estimate, an estimate range was established with the low BDER excluding the risks of additional safety controls and the high BDER with those controls included. It was concluded that at an 80% probability of project success would require a low BDER T&PRA contingency of 4.1 million dollars, given that any realization of risk leading to the introduction of additional safety controls in the design would result in the change control process being used to fund those additional costs within the limits documented within the high BDER estimate.

The following opportunities were also identified and validated as follows:

- 084 Raise the Hazard Category of the FBSR Facility to Increase Throughput – DELETED – Hazard Category 2 is being assumed for the current design which already uses optimum throughput for the existing space dimensional limitations.
- 096 Deploy WAO as Preferred TTP Option – Will be enhanced by accelerating EM-21, SRNL and LWO WAO development activities and in parallel performing accelerated design activities. By bringing forward the decision point at which FBSR and WAO will be evaluated against each other, deployment of WAO (if desirable) will occur early at a cost savings.

4.0 CONCLUSIONS

As part of the ongoing project activities, risk statusing and tracking will be performed on the TTP Project. RHSs will be included in the Project schedule and within the Project action item database. As new risks are identified by the Project Team they will be assessed and RHSs developed and implemented. Periodically these risks and updates to existing risks will be issued in a revision to this report. This process will continue for the life of the Project.

5.0 REFERENCES

1. Y-RAR-G-00022, PBS-SR-0014, Radioactive Liquid Tank Waste Stabilization and Disposition, Risk Management Plan, Revision 4, August 2008.
2. G-TC-H-00046, Task Requirements and Criteria, Tank 48 Disposition by Fluidized Bed Steam Reforming Project, Revision 4, July 24, 2008.
3. WSRC Manual E11, Conduct of Project Management and Controls, Procedure 2.62, Revision 9, September 11, 2006, Project Risk and Opportunity Analysis.
4. LWO-PIT-2007-00062, Life-cycle Liquid Waste Disposition System Plan, Revision 14.1, October 2007.
5. Systems Engineering Methodology Guidance Manual, WSRC-IM-98-00033, Appendix B Risk Management, Revision 7, March 1, 2008.
6. CBU-SPT-2004-00291, CBU, LWDP, Development of a Risk Management Strategy for LWDP, Revision 0, December 2004.

6.0 APPENDICES

6.1 – Risk Topics

6.2 – Risk Probabilities

6.3 – Risk Consequences

6.4 – Risk Level Matrix

6.5 – Risk Summary and Assessment Forms

6.6 – Crystal Ball Report

6.7 – Riskometer

6.1: Risk Topics

Design

- Undefined, Incomplete, Unclear Functions or Reqs
- Complex Design Features
- Numerous or Unclear Assumptions or Bases
- Reliability
- Inspectability
- Maintainability
- Safety Class
- Availability
- Errors and Omissions in Design

Regulatory & Environmental

- Environmental Impact Statement Req'd. (EIS)
- Additional Releases
- Undefined Disposal Methods
- Permitting
- State Inspections
- Order Compliance
- Regulatory Oversight

Safeguards & Security

Category I nuclear materials

- Classified process / information

Technology

- New Technology
- Existing Technology Modified
- New Application of Existing Technology
- Unknown or Unclear Technology

Procurement

- Procurement Strategy
- First-use Subcontractor/Vendor
- Vendor Support

Construction Strategy

- Turnover/Start-up Strategy
- Direct Hire/Subcontract
- Construction/Maintenance Testing
- Design Change Package Issues

Testing

- Construction
- Maintenance
- Operability
- Facility Startup
- System Startup (Subcontractor or PE&CD)

Resource/Conditions

- Material/Equipment Availability
- Specialty Resources Required
- Existing Utilities Above and Underground
- Support Services Availability
- Geological Conditions
- Temporary Resources (Power, Lights, Water, etc.)
- Resources Not Available
- Construction Complexities
 - Transportation
 - Critical Lifts
 - Population Density
- Escorts
- Personnel Training & Qualifications
- Tools, Equipment Controls & Availability
- Experience with system/component (design, operations, maintenance)
- Work Force Logistics
 - Operations Support
 - Health Physics
 - Facility Support
 - Facility Maintenance Centralized Maintenance
 - Construction Support Post Modifications
- Training
- Research and Development Support
- Multiple Project/Facility Interface
- Facility Work Control Priorities

- Lockout Support

Safety

- Criticality Potential
- Fire Watch
- Exposure Contamination Potential
- Authorization Basis Impact
- Hazardous Material Involved
- Emergency Preparedness
- Safeguards & Security
- Confinement Strategies

Management

- Funding uncertainties
- Stakeholders Program Strategy Changes
- Errors and Omissions in Estimates
- Fast track/critical need
- Infrastructure influence

Safety/ISMS

- Established operating practices
- Established, proven operating procedures
- Requires changes to AB documents or new USQ
- Unique operating logistics required
- Additional operations personnel required
- New TSR) limits or surveillance's
- Limited access/egress
- Complex emergency/off-normal operational steps
- Equipment reliability

Security

- New security systems required
- New security practices required
- Additional security personnel required
- Revised MC&A requirements

Mission

- Affect other facility/site missions
- Interfacing with off-site organizations required
- Shipment to off-site locations required
- Operation susceptibility to external intervention

Integration

- Work included in division/area/facility master schedule
- Design/construction schedule conflicts
- Other site division involvement

Waste Management

- New waste streams generated
- New waste management practices being implemented
- Additional quantities of waste being generated

Interfaces

- Multiple Agencies, Contractors
- Special Work Control/Work Auth. Procedures
- Operating SSCs Including Testing
- Multiple Customers
- Co-Occupancy
- Outage Requirements
- Multiple systems
- Radiological Conditions (Current and Future)
 - Contamination
 - Radiation
- Multiple Projects
- Proximity to Safety Class Systems

Operation

- Non-routine and/or complex operation
- Routine operational stoppages required
- Analytical sampling required during operations

Engineering/R&D

- Newly deployed technology
- Transient technology, replacement component differ

Infrastructure

- Equipment operating beyond intended/useful life
- Support facility reliability (steam, waste, etc.)
- Spare parts availability

Facility Capability

- Additional capital funded/project requirements
- Modification to existing project scope

6.2: Risk Probabilities

Probability of Occurrence	Criteria
0.1 or less Very Unlikely	Chance of occurrence is less than or equal to 10%
0.2, 0.3, 0.4 Unlikely	Chance of occurrence is between 10% and 40%
0.5, 0.6, 0.7 Likely	Chance of occurrence is between 40% and 80%
0.8, 0.9, >0.9 Very Likely	Chance of occurrence is 80% or greater

6.3: Risk Consequences

Consequence of Occurrence	Criteria
Negligible (<0.15)	Minimal consequences, unimportant. Some potential transfer of money, but budget estimates not exceeded, up to \$50K. Negligible impact on project, slight potential development schedule change (≤ 1 week), compensated by available schedule float.
Marginal ($0.15 - < 0.45$)	Small, acceptable, reduction in modification project technical performance. Cost estimates exceed budget $> \$50K$ to $\geq \$250K$. Minor slip in schedule (> 1 week to 2 weeks) with some potential adjustment to milestones required.
Significant ($0.45 - < 0.75$)	Significant degradation in modification/project technical performance. Cost estimates exceed budget by $> \$250K$ to $\geq \$1.5M$. Significant slip in schedule (> 2 weeks up to 2 months) resulting in milestone changes that may affect facility mission.
Critical ($0.75 - < 0.9$)	Technical goals of modification/process cannot be achieved. Cost estimates seriously exceed budget by $> \$1.5M$ to $\geq \$3M$. Excessive schedule slip (> 2 months up to 3 months) possibly affecting overall facility mission.
Crisis ≥ 0.9	Modification cannot be completed within the constraints of existing schedule and budget. Cost estimates unacceptably exceed budget by $> \$3M$ or more. Schedule slip (>3 months); possibly causing loss of mission.

6.4: Risk Level Matrix

		RISK LEVEL				
		Low	Moderate	High	High	High
P R O B A B I L I T Y	Very Likely	Low	Moderate	High	High	High
	Likely	Low	Moderate	Moderate	High	High
	Unlikely	Low	Low	Moderate	Moderate	High
	Very Unlikely	Low	Low	Low	Moderate	High
	Non-Credible	Low	Low	Low	Low	Low
		Negligible	Marginal	Significant	Critical	Crisis
CONSEQUENCES						

6.5: Risk Summary and Assessment Forms

Risk ID	Risk Title	Likelihood	Consequence	Risk Level (Initial)	Handling Strategy	Description	Residual Risk Level
001	Funding Availability	Unlikely	Crisis	High	Mitigate	Keep Senior Management informed about project needs/progress. Ensure required funding is approved and if funding becomes unavailable, effect a baseline change proposal to project.	N/A
002	Interfaces with Other Facilities and Projects	Very Likely	Significant	High	Reduce	Keep H-Tank Farm Facility Project Owners & Managers informed about project needs/progress. Maintain integrated project schedule with appropriate logic ties between project & facility activities.	Moderate
003	Sampling and Analysis Turnaround Impacts Production	Likely	Significant	Moderate	Reduce/Mitigate	Develop Sample & Analytical Plans well in advance of actual operations including a strategy where a sample of every transfers is not required, i.e. take weekly or months samples similar to what is done for the evaporator overheads. Ensure back-up instrumentation is available in case of equipment failure. Develop a contingency plan if analytical results are not available, i.e. tighten the acceptable tolerance of the latest sample to verify results and to justify continued operation.	Low
004	Accessibility for Construction Work	Very Likely	Significant	High	Reduce/Mitigate	Coordinate work with operations and other projects through participation in facility Work Window Lock-ins, 8 Week Lookaheads (T8s), and Plan of the Days (PODs). When activities are locked in, ensure critical resources (i.e. rigging, radcon, IH, etc.) are onboard and ready to support.	Moderate
007	DOE Directed Changes to Technical Requirements	Very Unlikely	Crisis	High	Mitigate	Changes to the Technical baseline imposed by DOE would be a change in project scope and a BCP would be generated.	N/A

Risk ID	Risk Title	Likelihood	Consequence	Risk Level (Initial)	Handling Strategy	Description	Residual Risk Level
008	Availability of Construction Equipment	Unlikely	Significant	Moderate	Accept	This risk is accepted based on priority being requested for on-site crane. Although priority for crane usage is requested, a higher priority could still "bump" this project.	Low
009	Readiness/ORR Assessment Findings	Unlikely	Significant	Moderate	Reduce/Mitigate	Project Team develop and perform detailed management checklist prior to beginning RA. Continued engagement of DOE, Operations and Safety organizations in the system design reviews and testing activities. DOE Operations and Safety organizations to participate in test activities conducted before the DOE ORR. Engage the DOE ORR Team prior to the SAT to enable the team to become familiar with the systems and operations.	Low
011	Unsafe Conditions Discovered at Turnover	Likely	Significant	Moderate	Reduce/Mitigate	SMI-51 walkdown team to participate in design reviews and weekly walkdowns.	Low
012	Stakeholder Participation	Likely	Significant	Moderate	Mitigate	Develop communication plan for involving stakeholders. Keep Stakeholders/Senior Management informed of R&D results. If stakeholders do impose additional design/operational /research/testing requirements on the project, a BCP will be developed.	N/A
013	Safety Basis not Accepted By DOE	Very Unlikely	Crisis	High	Reduce/Mitigate	Ensure formal/informal DOE involvement during SBS development and prior to WSRC request for approval to avoid final minute surprises. DOE will participate in the CHA meetings, and SIRC's. Briefing of positions will be given to DOE Engineering a key points in the development of the safety basis.	Low
014	Resources Not Available	Likely	Significant	Moderate	Reduce	Establish project baselines and key contract milestones. Maintain timely funding authorizations and accurate resource forecasts for all support organizations.	Moderate

Risk ID	Risk Title	Likelihood	Consequence	Risk Level (Initial)	Handling Strategy	Description	Residual Risk Level
015	Safety Basis Requirements Change From 50% to 95% Meteorology	Likely	Significant	Moderate	Mitigate	Engineering is continuing to correspond with DOE to actively pursue their concurrence that 95% Meteorology will not be required for the facility. If this risk is realized for the Low BDER, a BCP will be issued. For the High BDER, the implementation of 95% meteorology is included in the scope with appropriate contingency.	N/A
016	Implementation of DNFSB Recommendation 2004-2 Required	Unlikely	Crisis	High	Reduce/ Mitigate	The TTP Project Design strategy complies with current DOE orders and site procedures. The FBSR Project will perform and document a review of the FBSR Active Confinement System vs DNFSB 2004-2 DIDE Design Criteria and Design FBSR Active Confinement System to address significant vulnerabilities and perform cost benefit analysis to support not modifying design should this risk be realized. If this risk is realized for the Low BDER, a BCP will be issued. For the High BDER, the implementation of DNFSB Recommendation 2004-2 is included in the scope with appropriate contingency.	N/A
018	Product Must Go to a Different Receipt Tank	Unlikely	Critical	Moderate	Mitigate	Perform testing to confirm compatability with Tank Farm receipt tank and associated downstream process. Develop a backup plan to identify a tank capable of receiving FBSR product. Identify a transfer path to backup tank. Develop design to enable transfer path ready for issuance should it be required.	Low
019	Addition of the GAC to Design	Very Unlikely	Crisis	High	Mitigate	Complete analysis of Hazen test data and flowsheet development and work with environmental to determine that the GAC bed indeed is not required in sufficient time to minimize schedule impact.	Low
020	Analysis of 241-96H Structure Shows Not-Qualified for PC-3	Likely	Significant	Moderate	Mitigate	Perform the PC-3 Analysis during preliminary design to identify impacts prior to baselining the project.	Moderate

Risk ID	Risk Title	Likelihood	Consequence	Risk Level (Initial)	Handling Strategy	Description	Residual Risk Level
022	Interfaces With New Contractor Impacts Project	Unlikely	Significant	Moderate	Reduce/Mitigate	Ensure early involvement of subcontractor in preliminary design. Expedite preliminary design.	Low
023	Design Assumptions and Design Uncertainties Result In Rework	Unlikely	Crisis	High	Reduce/Mitigate	Determine the need for new electrical substation; Define spacial limitations clearly in procurement specification; Perform an HVAC study to determine the adequacy of the existing system and develop and issue a viable automation and controls strategy. Verify the existing slurry pumps and other equipment will be available to mix the bulk contents of Tank 48 and that new slurry pump VFDs for Tank 48 will be available to support FBSR operation.	Moderate
024	Insufficient Maintainability Provided	Likely	Critical	High	Reduce	Have Maintenance, Ops and Rad Con involved in the design to ID and resolve issues during the design of the skid.	Low
027	Availability of Consumables	Likely	Significant	Moderate	Reduce/Mitigate	Perform identification of critical spares/resources. Set up parts in stores. Where practical, consumables critical to this project and with lead times greater than one week shall be set up in site stores.	Low
028	Waste Feed Nozzle Deposits	Likely	Significant	Moderate	Reduce	Perform ESTD testing with Tank 48 simulant. Engineering Scaled Testing Lessons Learned will be incorporated into clean in place design. Inspect DMR feed nozzle for deposits after ESTD testing.	Moderate
029	Scale-up of FBSR Process Encounters Problems (LLWDSP ISSUE)	Unlikely	Crisis	High	Avoid	The Hazen tests will validate design flow rates of Tank 48 simulate feed. Expected flow rate will be based on a smaller 15" DMR bed unit. The design for the Tank 48 unit will be a 20" bed DMR. The inability of the scaled-up FBSR to meet throughput requirements is not considered a risk to the project, however this is an issue that will impact the LLWDSP.	N/A

Risk ID	Risk Title	Likelihood	Consequence	Risk Level (Initial)	Handling Strategy	Description	Residual Risk Level
033	Long Lead Procurement is Denied or Delayed	Unlikely	Crisis	High	Reduce	Include strategy for request for early approvals of long lead procurements in CD-0 in order to obtain early agreement of DOE with strategy. If approval is not obtained, the Project will be re-baselined using the appropriate change control mechanism.	N/A
034	Particle Size Control Problems	Likely	Significant	Moderate	Avoid	Screen placed at the suction of Tank 48 transfer pump to prevent large particle from entering the feed nozzle.	N/A
038	Availability Cannot be Achieved (LLWDSP ISSUE)	Unlikely	Critical	Moderate	Reduce/Mitigate	Vendor is required to perform a RAMI analysis on the system. Have Vendor engineers on hand during vendor testing, startup and cold runs.	N/A
042	Discovery of Soil Contamination	Unlikely	Significant	Moderate	Mitigate	Perform early soil samples.	Low
043	Engineered Equipment (Skids) Deliveries do not Support Construction Schedule	Likely	Critical	High	Reduce	Have a FPEG assigned to the Project Team to expedite and track procurements.	Low
046	Scaling Occurs in the DMR During Operation (operational vulnerability)	Likely	Crisis	High	Reduce	Analyze material samples collected from Hazen testing. Inspect DMR for build-up during all testing and develop ops and maintenance procedures for preventing build-up or cleaning during radioactive operation.	N/A

Risk ID	Risk Title	Likelihood	Consequence	Risk Level (Initial)	Handling Strategy	Description	Residual Risk Level
050	Tank Farm Equipment Failure (LLWSDP ISSUE)	Unlikely	N/A	N/A	Accept	This risk is accepted as handling of this risk is presently being performed by Tank Farm operations by establishing system health evaluation of key systems that can impact major processing activities. Implementing the requirements of the evaluation e.g. ensuring adequate spare parts/equipment are identified and on hand is being performed to support facility operations. Completion of this program risk handling strategy will bring the probability and consequence of equipment failure to levels that are acceptable and no longer considered as a risk.	N/A
052	Simulant and Waste Differences Impact Commissioning of FBSR	Very Unlikely	Crisis	High	Reduce	To date, extensive simulant development has been performed to reduce the likelihood of this risk being realized and pilot facility testing has been performed. Additional real waste testing will be performed at SRNL.	Moderate
055	Slurry Pump Limitations Require Alternate or Additional Equipment	Unlikely	Crisis	High	Mitigate	Perform evaluation to determine if additional mixing is required and develop alternate strategy. Install in-tank turbidity/density meter.	Moderate
056	Facility Support System Capacity/Life	Unlikely	Critical	Moderate	Mitigate	Determine the utility needs earlier during preliminary design and verify their availability. Have maintenance and Ops verify that the utilities are in good working order during the design phase. Schedule impact avoided.	Low
057	Integration of Multiple Internal Technical Agencies	Likely	Critical	High	Reduce	Assign a PEM to coordinate this effort and have regular Engineering Meetings with the total engineering team.	Low
058	Multiple Design Input Documents	Very Unlikely	Critical	Moderate	Reduce	Assign a PEM to coordinate this effort and have regular Engineering Meetings with the total engineering team.	Low

Risk ID	Risk Title	Likelihood	Consequence	Risk Level (Initial)	Handling Strategy	Description	Residual Risk Level
059	Undefined Disposal Method for Waste Generated During Operations and Eventual D&R	Very Likely	Significant	High	Reduce	Identify disposal path upfront in preparation for filter replacement	Low
061	Facility Space Limitations	Very Unlikely	Crisis	High	Reduce/Mitigate	Asbuilt available space within the building. Make the space availability a requirement for the FBSR Vendor.	Low
062	Project Strategy Does Not Support Tank 48 Return to Service Need (LLWDSP ISSUE)	Very Likely	Crisis	High	Accept	If Tank 48 can not be returned to service to support the LLWDSP, future Tank Closure commitments may not be achieved. This is not a risk for the Project, however it is an issue to be resolved by the LWO Planning Group.	N/A
063	FBSR Equipment Transportation	Very Unlikely	Significant	Low	Mitigate	Plan up front in the design of the skids and coordinate with the Vendor to ensure special vehicles are available. Perform receipt inspection.	Low
064	Multiple External Interfaces	Likely	Critical	High	Reduce	Schedule early approval of long lead procurements to ensure critical vendor information is available in a timely fashion. Integrate project activities into facility schedule. Establish project milestones to manage schedule float and visibility of project priorities.	Moderate
066	Emergent Startup Issues	Very Likely	Crisis	High	Reduce/Mitigate	Perform ESTD testing.	Moderate
069	Facility Services Design Complexity	Unlikely	Significant	Moderate	Reduce/Mitigate	Specify and/or coordinate the tie-in point in the specification or during the review and approval of the Vendor design.	Low
070	Persistent Contamination Control Issues	Likely	Critical	High	Reduce/Mitigate	Design equipment and facility for ease of decontamination. During cold runs use a simulant capable of uncovering potential contamination pathways.	Low

Risk ID	Risk Title	Likelihood	Consequence	Risk Level (Initial)	Handling Strategy	Description	Residual Risk Level
071	Unacceptable Ventilation Impact	Unlikely	Critical	Moderate	Mitigate	During preliminary design obtain HVAC requirements for the FBSR skid and confirm that the existing system is adequate or identify what modifications are required.	Low
072	Module Handling and Installation	Very Unlikely	Marginal	Low	Avoid	Ensure requirements are placed in procurement specification for all handling equipment to be provided by the vendor. Review vendor design and lifting procedures.	N/A
073	Secondary Containment Required For Off-Gas Line	Very Unlikely	Critical	Moderate	Mitigate	Develop parallel options for the off-gas sytem tie in such as including the filter assemblies within the Hold Tank Room or establishing a deviation from site codes and standards to allow routing of the line outside of the building.	Low
074	Heel Removal and Processing Does Not Meet Expectations	Likely	Crisis	High	Reduce/Mitigate	Revise operating strategy to process settled TPB to more effectively use existing supernate in Tank 48. Collect data with different slurry pump combinations and settling times to validate operating strategy.	High
075	Design/Operational Life Is Inadequate (Operational Vulnerability)	Likely	Crisis	High	Reduce	Develop procurement specification to ensure a robust design of major equipment. During startup testing, focus on identification of adverse indications that may reduce life expectancy and correct whenever feasible.	N/A
076	Aggressive Post Installation Testing Schedule	Likely	Significant	Moderate	Reduce/Mitigate	Although PS SSCs require a commensurate level of QA, include additional QA inspection in critical installation periods to ensure correct installation and eliminate rework. Perform additional criteria review and validation steps to assure that rework during testing is minimized.	Low

Risk ID	Risk Title	Likelihood	Consequence	Risk Level (Initial)	Handling Strategy	Description	Residual Risk Level
077	Positive Pressure Within Process Requires Additional Confinement Requirements	Very Unlikely	Significant	Low	Mitigate	Start waiver process early to avoid schedule impact and reduce cost of modification by performing during initial design phase.	Low
078	Scope reductions and conceptual phase CD-1 package assumptions do not materialize	Very Likely	Critical	High	Mitigate	List all key assumptions. Further develop assumptions during preliminary design with Operations involvement. Keep Senior Management engaged in cost savings measures to assure support and influence to address organizational impacts and project cost control.	High
079	Adequacy of Existing Foundations for the FBSR Skid	Unlikely	Critical	Moderate	Mitigate	Perform the required analysis early in preliminary design.	Moderate
080	Unable To Determine Permissible Residual TPB Limit Has Been Met	Unlikely	Critical	Moderate	Avoid	Develop a more practical criterion for determination of residual TPB level based on measuring the TPB in Salt solution flush effluents, prediction of residual TPB transportation to downstream facilities and potential impacts to those facilities e.g. flammability concerns etc. Implement this verification method during Tank 48 heel processing.	N/A
082	Organic Carries Over to Product Mix Tank	Unlikely	Critical	Moderate	Reduce/Mitigate	Provide a design constraint to the vendor at initial design for preventing organics from entering the PMT. Ensure the feature meets our needs during design review process.	Moderate
083	DWPF Processing Impacted by FBSR Product	Likely	Crisis	High	Mitigate	Perform further evaluation of the process for reducing of carbon fines in the final product stream.	Moderate

Risk ID	Risk Title	Likelihood	Consequence	Risk Level (Initial)	Handling Strategy	Description	Residual Risk Level
085	Maintenance Requires Remote Operations	Likely	Crisis	High	Mitigate	During design, assure all items requiring maintenance are designed and located for easy access, removal and replacement to reduce maintenance time. Where possible provide shielding portals for access and rigging/hoisting points that take advantage of available distance and shielding. Determine if any equipment bails, hoist attachments, or camera views would be beneficial for some equipment maintenance activities.	Moderate
086	Depleted Uranium is Required to be Added Prior to Transfer to Tank Farm Receipt Tank	Likely	Marginal	Moderate	Mitigate	Perform NCSE/NCSA and provide ability to add depleted uranium to Tank 48 or Product Mix Tank.	Moderate
087	High Silica Content Creates a Processing Problem at 2H Evaporator	Likely	Crisis	High	Mitigate	Perform testing to determine soluble silica expected in the Tank Farm receipt tank. Evaluate impact to 2H evaporator system and determine if additional action is required to reduce/remove silica.	High
089	Technology Issues Make Deployment Impractical	Very Unlikely	Crisis	High	Mitigate	Develop a backup technology (Wet Air Oxidation) in parallel to maturing the FBSR option. Add a milestone to the project schedule at an appropriate time in the development of FBSR to establish FBSR viability declaration.	High
090	Interim Standard 1189 Guidance Differs from Approved Standard	Unlikely	Crisis	High	Mitigate	Project management and Design Authority will work with DOE to identify any differences between Standard and Interim Guidance to allow earliest possible execution of design changes to minimize impact. If this risk is realized, a BCP will be generated. The CD-1 range estimate has been increased from (\$96 - \$138M) to (\$100 - 150M) to allow additional contingency funds for this risk.	N/A

Risk ID	Risk Title	Likelihood	Consequence	Risk Level (Initial)	Handling Strategy	Description	Residual Risk Level
092	NESHAP Air Permit (Non-Rad) Exemption is not Possible	Likely	Critical	High	Mitigate	Develop data and perform calculation to determine emission levels of unit in sufficient time to allow a permit to be requested should the thresholds be exceeded.	Low
093	Accident Analysis Determines Additional Safety Controls are Required	Very Likely	Crisis	High	Accept	Safety Class controls have been priced and included in the High BDER estimate, therefore if this risk is realized, the High BDER scope will be implemented via an appropriate change control mechanism.	N/A
094	Startup/Shutdown Creates Material for Which There is no Disposition path	Likely	Critical	High	Mitigate	Evaluate properties of partially processed DMR material and perform testing to determine/identify disposition path. Complete ESTD testing and roll lessons learned into control system design.	Moderate
095	Solids Formation in PMT	Likely	Significant	Moderate	Avoid	Evaluate solids dissolution using sodium hydroxide and design and install a sodium hydroxide addition system.	N/A

Risk / Opportunity Assessment Form					
ID Number: 001		Revision: 00		Last Date Evaluated: 12-Oct-06	
Status: Active					
Event Title: Funding Availability					
Type: Risk			Category:		
Assess. Element: 3.0		Title: General			
Responsible Org: -			Contact: PM - Jon Lunn	Date Identified: 12-Oct-06	
Statement of Event: Project must be adequately funded to be successful. Funding falls short of project needs. Project cannot be completed.					
Likelihood:	Unlikely	Basis: Funding short falls occur with regularity.			
Consequence / Benefit:	Crisis	Basis: Schedule delay up to and including demobilization and placing project on hold.			
Most Significant Cost Impact (\$k): N/A			Most Significant Schedule Impact (Wks): N/A		
Level:	High	Event Trigger: Open-Currently open / Close-"CD-4 DOE Approval" (WH48CD-106)			
Handling Strategy:	Mitigate	Description: Keep Senior Management informed about project needs/progress. Ensure required funding is approved and if funding becomes unavailable, effect a baseline change proposal to project.			
Handling Strategy Action Items:					
001-1 Keep Senior Management informed about project needs/progress., , PM - Jon Lunn,					
001-2 Ensure required funding is approved and if funding becomes unavailable, effect a baseline change proposal to project., , PM - Jon Lunn,					
001-3 Upon subcontract approval, the Project will be presented to the CCB for review., , PM - Jon Lunn,					
HS Implementation Cost (\$K):	0	Basis: Cost will be within the Project baseline for PM activities.			
HS Implementation Schedule (Wks):	Ongoing	Basis: This activity will be performed for the entire length of the Project.			
Other Handling Strategies:					
Statement of Residual Risk: As a BCP will be initiated upon realization of this risk, no residual risk to the project exists.					
Residual Likelihood:		Basis:			
Residual Consequence:		Basis:			
Residual Risk Level:			Residual Impact Basis:		
Residual Cost Impact (\$K):	<u>Best Case</u>	<u>Most Likely</u>			<u>Worst Case</u>
Residual Schedule Impact (Mos):					
Impacted Scope of Work:					
Evaluation Comments:					
Event Comments: There will be no residual risk to the project as a BCP will be developed however, this risk could impact the LWDPP if realized. This risk should be reviewed as part of the LWDPP risk assessment activities.					

Risk / Opportunity Assessment Form				
ID Number: 002		Revision: 00		Last Date Evaluated: 12-Oct-06
Status: Active				
Event Title: Interfaces with Other Facilities and Projects				
Type: Risk			Category:	
Assess. Element: 3.0		Title: General		
Responsible Org: -			Contact: PM - Jon Lunn	Date Identified: 12-Oct-06
Statement of Event: This project will interact with other facilities and projects during construction, startup, testing and operation. Priorities conflict with other facilities and projects. Due to conflicts, Project is delayed.				
Likelihood:	Very Likely	Basis: Projects and facilities that interact with this project are subject to conflicting priorities		
Consequence / Benefit:	Significant	Basis: Cost increases and schedule delays		
Most Significant Cost Impact (\$k): 100			Most Significant Schedule Impact (Wks): 4 Wks	
Level:	High	Event Trigger: Open-"Install Transfer Lines" (WH48CS-420) / Close-"WSRC/DOE ORR's Complete" (WH48CS-085)		
Handling Strategy:	Reduce	Description: Keep H-Tank Farm Facility Project Owners & Managers informed about project needs/progress. Maintain integrated project schedule with appropriate logic ties between project & facility activities.		
Handling Strategy Action Items:				
002-1 Keep H-Tank Farm Facility Project Owners & Managers informed about project needs/progress., , PO - Charles Lampley,				
002-3 Maintain integrated project schedule with appropriate logic ties between project & facility, , , PM - Jon Lunn,				
HS Implementation Cost (\$K):	0	Basis: Development of an integrated detailed project schedule is within the baseline.		
HS Implementation Schedule (Wks):	Ongoing	Basis: Development and maintenance of a detailed project schedule is an on-going task. for the life of the Project.		
Other Handling Strategies:				
Statement of Residual Risk: Unanticipated and/or changing priorities in HTF operations still occurs.				
Residual Likelihood:	Likely	Basis: Unanticipated and/or changing priorities in HTF operations is not uncommon and can still occur.		
Residual Consequence:	Marginal	Basis: Most likely case of working O/T to make up some impact to critical path, but being unable to mitigate 1 week delay.		
Residual Risk Level:	Moderate	Residual Impact Basis: Worst Case: Plan on O/T to make up some impact to critical path, but 2 weeks delay remains.		
Residual Cost Impact (\$K):	<u>Best Case</u> 0	<u>Most Likely</u> 50	<u>Worst Case</u> 50	Most Likely Case: Plan on O/T to make up some impact to critical path, but 1 week delay remains.
Residual Schedule Impact (Mos):	0	2 Wk	4 Wks	Best Case: Priority changes occur but do not impact critical path
Impacted Scope of Work:				
Evaluation Comments:				
Event Comments: Action item 2 deleted as the strategy for transfers to and from Tank 48 and 43 has been changed.				

Risk / Opportunity Assessment Form				
ID Number: 003		Revision: 00		Last Date Evaluated: 12-Oct-06
Status: Active				
Event Title: Sampling and Analysis Turnaround Impacts Production				
Type: Risk			Category:	
Assess. Element: 1.0		Title: Processing		
Responsible Org: -			Contact: Tim Baughman	Date Identified: 12-Oct-06
Statement of Event: Process samples must be analyzed during operation of FBSR. Rate of return of analytical results is slowed or additional samples are required. Timing and progress of sample results is delayed and production is impacted, since material can not be transferred making room for fresh feed.				
Likelihood:	Likely	Basis: Parallel site (and LWD) projects may place competing demands on SRNL Analytical Staff. Key equipment is unique and seldom used. Potential for equipment failure or competing resource needs is high.		
Consequence / Benefit:	Significant	Basis: Estimated delay due to sampling and analysis turnaround impacts.		
Most Significant Cost Impact (\$k): 200			Most Significant Schedule Impact (Wks): 4 Wks	
Level:	Moderate	Event Trigger:		
Handling Strategy:	Reduce/ Mitigate	Description: Develop Sample & Analytical Plans well in advance of actual operations including a strategy where a sample of every transfers is not required, i.e. take weekly or months samples similar to what is done for the evaporator overheads. Ensure back-up instrumentation is available in case of equipment failure. Develop a contingency plan if analytical results are not available, i.e. tighten the acceptable tolerance of the latest sample to verify results and to justify continued operation.		
Handling Strategy Action Items:				
003-1 Develop Sample & Analytical Plans well in advance of actual operations including a strategy where a sample of every transfers is not required, i.e. take weekly or months samples similar to what is done for the evaporator overheads., , DA - Satish Shah,				
003-2 Ensure back-up instrumentation is available in case of equipment failure., , DA - Satish Shah,				
003-3 Develop a contingency plan if analytical results are not available, i.e. tighten the acceptable tolerance of the latest sample to verify results and to justify continued operation., , DA - Satish Shah,				
HS Implementation Cost (\$K):	10	Basis: Cost of back-up instrumentation		
HS Implementation Schedule (Wks):	4	Basis: Handling strategy will not impact the schedule but will require contingency plan development and ordering of back-up equipment.		
Other Handling Strategies:				
Statement of Residual Risk: As this strategy avoids the risk, no residual risk remains.				
Residual Likelihood:	Very Unlikely	Basis: Implementation of handling strategy has reduced the likelihood of the event and mitigated the consequences.		
Residual Consequence:	Negligible	Basis: Some impact, but attainment is not impacted		
Residual Risk Level:	Low	Residual Impact Basis: Worst Case: Some impact to processing capabilities requiring additional work-arounds		
Residual Cost Impact (\$K):	<u>Best Case</u> 0	<u>Most Likely</u> 0	<u>Worst Case</u> 100	Most Likely Case: Some impact, but attainment is not impacted Best Case: Minimal impact and attainment is not impacted.
Residual Schedule Impact (Mos):	0	0	4 Wks	
Impacted Scope of Work:				
Evaluation Comments:				
Event Comments:				

Risk / Opportunity Assessment Form				
ID Number: 004		Revision: 00		Last Date Evaluated: 16-Oct-06
Status: Active				
Event Title: Accessibility for Construction Work				
Type: Risk			Category:	
Assess. Element: 3.0		Title: General		
Responsible Org: -			Contact: Mary Pallon	Date Identified: 16-Oct-06
Statement of Event: Construction work is required at or around Tank 48 and within Building 241-96H. Congestion / Collocation of work impacts accessibility to area on or around Tank 48/241-96H and/or Operations planned activities. Scheduled construction activities impacted.				
Likelihood:	Very Likely	Basis: Tank 48 has one of the most congested tank tops at SRS. If not closely coordinated construction and operations activities will interfere with each other. 241-96H will be in operations as the ARP Facility during installation of FBSR in the adjacent portion of the building.		
Consequence / Benefit:	Significant	Basis: Additional cost and delay to schedule.		
Most Significant Cost Impact (\$k): 100			Most Significant Schedule Impact (Wks): 4 Wks	
Level:	High	Event Trigger:		
Handling Strategy:	Reduce/ Mitigate	Description: Coordinate work with operations and other projects through participation in facility Work Window Lock-ins, 8 Week Lookaheads (T8s), and Plan of the Days (PODs). When activities are locked in, ensure critical resources (i.e. rigging, radcon, IH, etc.) are onboard and ready to support.		
Handling Strategy Action Items:				
004-1 Coordinate work with operations and other projects through participation in facility Work Window Lock-ins, 8 Week Lookaheads (T8s), and Plan of the Days (PODs)., , PM - Jon Lunn,				
004-2 When activities are locked in, ensure critical resources (i.e. rigging, radcon, IH, etc.) are onboard and ready to support., , PM - Jon Lunn,				
HS Implementation Cost (\$K):	0	Basis: Can be performed without additional cost		
HS Implementation Schedule (Wks):	0	Basis: Already part of ongoing scheduled activities		
Other Handling Strategies:				
Statement of Residual Risk: Some risk of accessibility problems still remains				
Residual Likelihood:	Likely	Basis: The likelihood has been reduced by the RHS, but not eliminated.		
Residual Consequence:	Marginal	Basis: Minor delay and minimal additional cost to project		
Residual Risk Level:	Moderate		Residual Impact Basis: Worst Case: Delays and additional cost to project Most Likely Case: Minor delay and minimal additional cost to project Best Case: Minor inconvenience, but no schedule or cost impact	
Residual Cost Impact (\$K):	<u>Best Case</u> 0	<u>Most Likely</u> 50	<u>Worst Case</u> 100	
Residual Schedule Impact (Mos):	0	2 Wks	4 Wks	
Impacted Scope of Work:				
Evaluation Comments:				
Event Comments:				

Risk / Opportunity Assessment Form						
ID Number: 007		Revision: 00		Last Date Evaluated: 16-Oct-06		
Status: Active						
Event Title: DOE Directed Changes to Technical Requirements						
Type: Risk			Category:			
Assess. Element: 3.0		Title: General				
Responsible Org: -			Contact: PM - Jon Lunn	Date Identified: 16-Oct-06		
Statement of Event: Conceptual design begins with a given set of requirements. Requirements change or additional requirements are imposed. Scope increases.						
Likelihood:	Very Unlikely	Basis: Typically requirements are relatively stable, however they can change. Project baselines will not be established until after Preliminary Design.				
Consequence / Benefit:	Crisis	Basis: Change in Tech baseline would likely result in cost and schedule baseline impact.				
Most Significant Cost Impact (\$k): 1,000			Most Significant Schedule Impact (Wks): 13 Wks			
Level:	High	Event Trigger:				
Handling Strategy:	Mitigate	Description: Changes to the Technical baseline imposed by DOE would be a change in project scope and a BCP would be generated.				
Handling Strategy Action Items:						
HS Implementation Cost (\$K):		Basis:				
HS Implementation Schedule (Wks):		Basis:				
Other Handling Strategies:						
Statement of Residual Risk:						
Residual Likelihood:		Basis:				
Residual Consequence:		Basis:				
Residual Risk Level:		Residual Impact Basis:				
Residual Cost Impact (\$K):	<u>Best Case</u>				<u>Most Likely</u>	<u>Worst Case</u>
Residual Schedule Impact (Mos):						
Impacted Scope of Work:						
Evaluation Comments:						
Event Comments:						

Risk / Opportunity Assessment Form						
ID Number: 008		Revision: 00		Last Date Evaluated: 16-Oct-06		
Status: Active						
Event Title: Availability of Construction Equipment						
Type: Risk			Category:			
Assess. Element: 3.0		Title: General				
Responsible Org: -			Contact: Mary Pallon	Date Identified: 16-Oct-06		
Statement of Event: It is assumed that a specialized crane can be obtained, with qualified personnel. Crane is not available when required. Project Delays.						
Likelihood:	Unlikely	Basis: This project is a high profile, accelerated project, which should increase priority for access to equipment. A crane can currently be made available on-site and has been requested for the required window.				
Consequence / Benefit:	Significant	Basis: New crane vendor must be found and contract placed.				
Most Significant Cost Impact (\$k): 500			Most Significant Schedule Impact (Wks): 1 Mth			
Level:	Moderate	Event Trigger:				
Handling Strategy:	Accept	Description: This risk is accepted based on priority being requested for on-site crane. Although priority for crane usage is requested, a higher priority could still "bump" this project.				
Handling Strategy Action Items:						
HS Implementation Cost (\$K):		Basis:				
HS Implementation Schedule (Wks):		Basis:				
Other Handling Strategies:						
Statement of Residual Risk: Crane may still be unavailable						
Residual Likelihood:	Unlikely	Basis: Likelihood remains unchanged				
Residual Consequence:	Negligible	Basis: Delay while waiting for equipment				
Residual Risk Level:	Low	Residual Impact Basis: Worst Case: New crane vendor must be found and contract placed. Most Likely Case: Delay while waiting for equipment Best Case: Project can reschedule without impact of overall delay				
Residual Cost Impact (\$K):	<u>Best Case</u> 0				<u>Most Likely</u> 0	<u>Worst Case</u> 500
Residual Schedule Impact (Mos):	0				1 Wk	6 Mths
Impacted Scope of Work:						
Evaluation Comments:						
Event Comments:						

Risk / Opportunity Assessment Form				
ID Number: 009		Revision: 00		Last Date Evaluated: 16-Oct-06
Status: Active				
Event Title: Readiness/ORR Assessment Findings				
Type: Risk			Category:	
Assess. Element: 3.0		Title: General		
Responsible Org: -			Contact: PO - Charles Lampley	Date Identified: 16-Oct-06
Statement of Event: Process has to be proved ready to operate. Process is found to be not ready by Readiness Assessment. Project is delayed while concerns are resolved.				
Likelihood:	Unlikely	Basis: Significant facility and system design and operating issues are very likely to be identified and resolved at earlier stages of the project and are unlikely to arise during the Operational Readiness Review (ORR). Therefore additional design, procurement, and construction activities will not be required. ORR reviewers are independent of the Project Team and may not agree with resolutions and may identify additional issues not previously evaluated.		
Consequence / Benefit:	Significant	Basis: Cost of design rework to resolve finding and schedule impact. At this advance stage of the project no major rework will be required, however limited rework could be necessary if this risk were realized.		
Most Significant Cost Impact (\$k): 100			Most Significant Schedule Impact (Wks): 2 Mths	
Level:	Moderate	Event Trigger:		
Handling Strategy:	Reduce/ Mitigate	Description: Project Team develop and perform detailed management checklist prior to beginning RA. Continued engagement of DOE, Operations and Safety organizations in the system design reviews and testing activities. DOE Operations and Safety organizations to participate in test activities conducted before the DOE ORR. Engage the DOE ORR Team prior to the SAT to enable the team to become familiar with the systems and operations.		
Handling Strategy Action Items:				
009-1 Project Team develop and perform detailed management checklist prior to beginning RA. Continued engagement of DOE, , , LWFO - Wyatt Clark,				
009-2 Engage the DOE ORR Team prior to the SAT to enable the team to become familiar with the systems, , , PO - Charles Lampley,				
009-3 Continued engagement of DOE, Operations and Safety organizations in the system design reviews and testing activities., , , PO - Charles Lampley,				
009-4 DOE Operations and Safety organizations to participate in test activities conducted before the DOE ORR, , , PO - Charles Lampley,				
HS Implementation Cost (\$K):	50	Basis: Cost of management checklist activities		
HS Implementation Schedule (Wks):	0	Basis: This could be performed in parallel with ongoing startup activities as functional areas become available for assessment.		
Other Handling Strategies:				
Statement of Residual Risk: Findings may still occur, but any potential for major findings will have been avoided				
Residual Likelihood:	Very Unlikely	Basis: Working closely with DOE reduces the likelihood of having unexpected ORR findings.		
Residual Consequence:	Marginal	Basis: Cost of minor finding resolution and schedule delay.		
Residual Risk Level:	Low	Residual Impact Basis: Worst Case: Cost of finding resolution and schedule delay		
Residual Cost Impact (\$K):	<u>Best Case</u> 10	<u>Most Likely</u> 25	<u>Worst Case</u> 50	Most Likely Case: Cost of minor finding resolution and schedule delay Best Case: Finding does not impact schedule in its resolution
Residual Schedule Impact (Mos):	0	2 Wks	1 Mth	
Impacted Scope of Work:				

Risk / Opportunity Assessment Form

ID Number: 009

Revision: 00

Last Date Evaluated: 16-Oct-06

Status: Active

Evaluation Comments:

Event Comments:

Risk / Opportunity Assessment Form				
ID Number: 011		Revision: 00		Last Date Evaluated: 16-Oct-06
				Status: Active
Event Title: Unsafe Conditions Discovered at Turnover				
Type: Risk			Category:	
Assess. Element: 3.0		Title: General		
Responsible Org: -			Contact: PM - Jon Lunn	Date Identified: 16-Oct-06
Statement of Event: Process requires a safety (SMI 51) walk down before start up. Unsafe conditions are discovered during walk down. Delay while remedial action is taken.				
Likelihood:	Likely	Basis: This is a new process for SRS		
Consequence / Benefit:	Significant	Basis: Cost of minor design changes and schedule delay.		
Most Significant Cost Impact (\$k): 150			Most Significant Schedule Impact (Wks): 1 Mth	
Level:	Moderate	Event Trigger:		
Handling Strategy:	Reduce/ Mitigate	Description: SMI-51 walkdown team to participate in design reviews and weekly walkdowns.		
Handling Strategy Action Items:				
011-1 Arrange for SMI-51 walkdown team to participate in design reviews, , , DA - Mike Augeri,				
011-2 Arrange for SMI-51 walkdown team to participate in weekly walkdowns, , , PM - Jon Lunn,				
HS Implementation Cost (\$K):	0	Basis: Design reviews are already included in the project baseline		
HS Implementation Schedule (Wks):	0	Basis: Will be conducted along with already scheduled project activities		
Other Handling Strategies:				
Statement of Residual Risk: Some SMI-51 concerns may still arise				
Residual Likelihood:	Unlikely	Basis: Likelihood is reduced by involving SMI-51 walkdown team in design reviews and weekly safety walkdowns.		
Residual Consequence:	Marginal	Basis: Cost of additional design and schedule impact		
Residual Risk Level:	Low	Residual Impact Basis: Worst Case: Cost of additional design and schedule impact		
Residual Cost Impact (\$K):	<u>Best Case</u> 0	<u>Most Likely</u> 75	<u>Worst Case</u> 100	Most Likely Case: Cost of additional design and schedule impact Best Case: No additional cost or schedule impact
Residual Schedule Impact (Mos):	0	2 Wks	3 Wks	
Impacted Scope of Work:				
Evaluation Comments:				
Event Comments: Non-Credible as a T&PRA risk as this is covered under standard contingency for the project.				

Risk / Opportunity Assessment Form						
ID Number: 012		Revision: 00		Last Date Evaluated: 16-Oct-06		
Status: Active						
Event Title: Stakeholder Participation						
Type: Risk			Category:			
Assess. Element: 3.0		Title: General				
Responsible Org: -			Contact: PO - Charles Lampley	Date Identified: 16-Oct-06		
Statement of Event: Project will fall under the scrutiny of various stakeholders. Stakeholders (DNFSB, DOE, Regulatory, etc.) do not accept R&D results. Project will be delayed while resolving stakeholder concerns.						
Likelihood:	Likely	Basis: Stakeholders are eager to offer their input.				
Consequence / Benefit:	Significant	Basis: Additional design, studies etc., will be required causing schedule delays and additional cost to project.				
Most Significant Cost Impact (\$K): 1500			Most Significant Schedule Impact (Wks): 2 Mths			
Level:	Moderate	Event Trigger:				
Handling Strategy:	Mitigate	Description: Develop communication plan for involving stakeholders. Keep Stakeholders/Senior Management informed of R&D results. If stakeholders do impose additional design/operational /research/testing requirements on the project, a BCP will be developed.				
Handling Strategy Action Items:						
012-1 Develop communication plan for involving stakeholders and keeping Stakeholders/Senior Management informed of R&D results., , PM - Jon Lunn,						
012-2 Prepare and issue Final Technology Report on R&D results to stakeholders., , LWO - Caroline Atseff,						
HS Implementation Cost (\$K):	0	Basis: This will not add additional cost to the project				
HS Implementation Schedule (Wks):	0	Basis: Is part of ongoing activities				
Other Handling Strategies:						
Statement of Residual Risk: There will be no residual risk to the project as a BCP will be developed however, this risk could impact the LWDPP if realized.						
Residual Likelihood:		Basis:				
Residual Consequence:		Basis:				
Residual Risk Level:		Residual Impact Basis:				
Residual Cost Impact (\$K):	<u>Best Case</u>				<u>Most Likely</u>	<u>Worst Case</u>
Residual Schedule Impact (Mos):						
Impacted Scope of Work:						
Evaluation Comments:						
Event Comments: There will be no residual risk to the project as a BCP will be developed however, this risk could impact the LWDPP if realized. This risk should be reviewed as part of the LWDPP risk assessment activities.						

Risk / Opportunity Assessment Form				
ID Number: 013		Revision: 00		Last Date Evaluated: 16-Oct-06
Status: Active				
Event Title: Safety Basis not Accepted By DOE				
Type: Risk			Category:	
Assess. Element: 3.0		Title: General		
Responsible Org: -			Contact: John Schwenker	Date Identified: 16-Oct-06
Statement of Event: TTP Safety Basis is required to be approved by DOE for implementation. DOE does not accept the Safety Basis. The Safety Basis will have to be modified or redone to DOE's acceptance requirements.				
Likelihood:	Very Unlikely	Basis: DOE may find that Safety Basis as written will not support appropriate development of required safety documents and related analysis for safe disposition of organic inventory in Tank 48.		
Consequence / Benefit:	Crisis	Basis: Rework of the DSA and possible changes in Control Strategies.		
Most Significant Cost Impact (\$k): 5,000			Most Significant Schedule Impact (Wks): 1 Yr	
Level:	High	Event Trigger: Requesting DOE approval		
Handling Strategy:	Reduce/ Mitigate	Description: Ensure formal/informal DOE involvement during SBS development and prior to WSRC request for approval to avoid final minute surprises. DOE will participate in the CHA meetings, and SIRC's. Briefing of positions will be given to DOE Engineering a key points in the development of the safety basis.		
Handling Strategy Action Items:				
013-1 Ensure formal/informal DOE involvement during SBS development and prior to WSRC request for approval to avoid final minute surprises., , , DA - Mike Augeri,				
013-2 DOE will participate in the CHA meetings, and SIRC's., , , DA - Mike Augeri,				
013-3 Briefing of positions will be given to DOE Engineering at key points in the development of the safety basis., , , DA - Mike Augeri,				
HS Implementation Cost (\$K):	0	Basis: These activities can be accomplished in this manner without additional cost.		
HS Implementation Schedule (Wks):	0	Basis: These activities are included in the Project Baseline Schedule.		
Other Handling Strategies:				
Statement of Residual Risk: Risk of DSA strategy changes still remains				
Residual Likelihood:	Very Unlikely	Basis: Likelihood reduced but not to non-credible		
Residual Consequence:	Significant	Basis: Modification of the DSA and minor changes in Control Strategies.		
Residual Risk Level:	Low	Residual Impact Basis: Worst Case: Rework of the DSA and changes in Control Strategies.		
Residual Cost Impact (\$K):	<u>Best Case</u> 20	<u>Most Likely</u> 250	<u>Worst Case</u> 1,000	Most Likely Case: Modification of the DSA and minor changes in Control Strategies.
Residual Schedule Impact (Mos):	0	2 Wks	2 Mths	Best Case: Modification of the DSA.
Impacted Scope of Work:				
Evaluation Comments:				
Event Comments:				

Risk / Opportunity Assessment Form				
ID Number: 014		Revision: 00		Last Date Evaluated: 16-Oct-06
Status: Active				
Event Title: Resources Not Available				
Type: Risk			Category:	
Assess. Element: 3.0		Title: General		
Responsible Org: -			Contact: PM - Jon Lunn	Date Identified: 16-Oct-06
Statement of Event: Resources are required for the implementation of TTP Project activities. These resources include Engineering, Construction, Operations, Maintenance, etc. Planned resources are not available when required. Activities cannot be completed as scheduled.				
Likelihood:	Likely	Basis: Experience with construction and start-up activities in other site organizations indicates that resource issues and limitations are likely to be encountered during the TTP Project.		
Consequence / Benefit:	Significant	Basis: Delay to project.		
Most Significant Cost Impact (\$k): 0			Most Significant Schedule Impact (Wks): 8 Wks	
Level:	Moderate	Event Trigger:		
Handling Strategy:	Reduce	Description: Establish project baselines and key contract milestones. Maintain timely funding authorizations and accurate resource forecasts for all support organizations.		
Handling Strategy Action Items:				
014-1 Establish project baselines and key contract milestones, , , PM - Jon Lunn,				
014-2 Maintain timely funding authorizations and accurate resource forecasts for all support organizations, , , PM - Jon Lunn,				
HS Implementation Cost (\$K):	0	Basis: Included within the planned Project Controls project management with no additional cost to the project.		
HS Implementation Schedule (Wks):	Ongoing	Basis: Baseline and forecasting is an on-going process for the life of the Project.		
Other Handling Strategies:				
Statement of Residual Risk: Planned resources could still not be available when required. Activities could not be completed as scheduled.				
Residual Likelihood:	Unlikely	Basis: The additional Project Controls reduce the likelihood of this event.		
Residual Consequence:	Significant	Basis: Most Likely Case: Project is somewhat impacted by resource limitations		
Residual Risk Level:	Moderate	Residual Impact Basis: Worst Case: Project is impacted by resource limitations		
Residual Cost Impact (\$K):	<u>Best Case</u> 0	<u>Most Likely</u> 0	<u>Worst Case</u> 0	Most Likely Case: Project is somewhat impacted by resource limitations Best Case: Project not impacted by resource limitations as work-arounds can be found
Residual Schedule Impact (Mos):	0	4 Wks	8 Wks	
Impacted Scope of Work:				
Evaluation Comments:				
Event Comments:				

Risk / Opportunity Assessment Form				
ID Number: 015		Revision: 00		Last Date Evaluated: 16-Oct-06
Status: Active				
Event Title: Safety Basis Requirements Change From 50% to 95% Meteorology				
Type: Risk			Category:	
Assess. Element: 3.0		Title: General		
Responsible Org: -			Contact: John Schwenker	Date Identified: 16-Oct-06
Statement of Event: The current DSA basis uses 50% Meteorology. If DOE-SR directs WSRC to use 95% Meteorology, DSAs must be revised to recalculate accident consequences using 95% meteorology which may in turn require new safety controls. The technical baseline of the TTP Project must be revised to address need for any new controls.				
Likelihood:	Likely	Basis: The radiological inventory is not anticipated to require modification should this risk be realized. The impact could require the development of additional engineering controls to the current design.		
Consequence / Benefit:	Significant	Basis: A BCP will be developed to support changing site consequence methodology. When 95% Meteorology is implemented the Evaluation Guideline will be 100 rem versus "challenging 100 rem". This provides some margin. The current estimated consequence do not warrant SS controls for 95% meteorology.		
Most Significant Cost Impact (\$k): 50			Most Significant Schedule Impact (Wks): 1 Mth	
Level:	Moderate	Event Trigger:		
Handling Strategy:	Mitigate	Description: Engineering is continuing to correspond with DOE to actively pursue their concurrence that 95% Meteorology will not be required for the facility. If this risk is realized for the Low BDER, a BCP will be issued. For the High BDER, the implementation of 95% meteorology is included in the scope with appropriate contingency.		
Handling Strategy Action Items: 015-1 Develop Safety Design Strategy (SDS) document and obtain DOE approval., , DA - Mike Augeri, 015-2 Develop PSDAR document and obtain DOE approval., , DA - Mike Augeri,				
HS Implementation Cost (\$K):	0	Basis: N/A		
HS Implementation Schedule (Wks):	0	Basis: N/A		
Other Handling Strategies:				
Statement of Residual Risk: If this risk is realized for the Low BDER, a BCP will be issued. For the High BDER, the implementation of 95% Meteorology is included in the scope with appropriate contingency.				
Residual Likelihood:		Basis:		
Residual Consequence:		Basis:		
Residual Risk Level:		Residual Impact Basis:		
Residual Cost Impact (\$K):	<u>Best Case</u>	<u>Most Likely</u>	<u>Worst Case</u>	
Residual Schedule Impact (Mos):				
Impacted Scope of Work:				
Evaluation Comments:				
Event Comments: If this risk is realized for the Low BDER, a BCP will be issued. For the High BDER, the implementation of 95% meteorology is included in the scope with appropriate contingency. This risk should be reviewed as part of the LWDP risk assessment activities.				

Risk / Opportunity Assessment Form				
ID Number: 016		Revision: 00		Last Date Evaluated: 16-Oct-06
Status: Active				
Event Title: Implementation of DNFSB Recommendation 2004-2 Required				
Type: Risk			Category:	
Assess. Element: 3.0		Title: General		
Responsible Org: -			Contact: John Schwenker	Date Identified: 16-Oct-06
Statement of Event: FBSR is a Haz Cat 2 Facility with active ventilation system but classified as PS. DNFSB 2004-2 provides design guidance for Haz Cat 2 facilities. DOE directs FSBR to implement the DIDE design guidance of DNFSB 2004-2.				
Likelihood:	Unlikely	Basis: DOE has accepted ARP ventilation system without a review of the DIDE design guidance. Therefore, it is unlikely to force total compliance for FSBR.		
Consequence / Benefit:	Crisis	Basis: Implementation of DNFSB 2004-2 may require a change to the current design to eliminate any design vulnerabilities vs DNFSB 2004-2 DIDE Design Criteria.		
Most Significant Cost Impact (\$k): 2,000			Most Significant Schedule Impact (Wks): 1 Yr	
Level:	High	Event Trigger:		
Handling Strategy:	Reduce/ Mitigate	Description: The TTP Project Design strategy complies with current DOE orders and site procedures. The FBSR Project will perform and document a review of the FSBR Active Confinement System vs DNFSB 2004-2 DIDE Design Criteria and Design FSBR Active Confinement System to address significant vulnerabilities and perform cost benefit analysis to support not modifying design should this risk be realized. If this risk is realized for the Low BDER, a BCP will be issued. For the High BDER, the implementation of DNFSB Recommendation 2004-2 is included in the scope with appropriate contingency.		
Handling Strategy Action Items:				
016-1 Perform and document a review of the FSBR Active Confinement System vs DNFSB 2004-2 DIDE Design Criteria, , , DA - Mike Augeri,				
016-2 Design FSBR Active Confinement System to address significant vulnerabilities., , , DS - Sergio Mazul,				
HS Implementation Cost (\$K):	0	Basis: No additional cost to the project as this is within the baseline		
HS Implementation Schedule (Wks):	0	Basis: Will be performed as part of ongoing scheduled activities		
Other Handling Strategies:				
Statement of Residual Risk: If this risk is realized for the Low BDER, a BCP will be issued. For the High BDER, the implementation of DNFSB Recommendation 2004-2 is included in the scope with appropriate contingency.				
Residual Likelihood:		Basis:		
Residual Consequence:		Basis:		
Residual Risk Level:		Residual Impact Basis:		
Residual Cost Impact (\$K):	<u>Best Case</u>	<u>Most Likely</u>	<u>Worst Case</u>	
Residual Schedule Impact (Mos):				
Impacted Scope of Work:				
Evaluation Comments:				
Event Comments: If this risk is realized for the Low BDER, a BCP will be issued. For the High BDER, the implementation of DNFSB Recommendation 2004-2 is included in the scope with appropriate contingency. This risk should be reviewed as part of the LWDPP risk assessment activities.				

Risk / Opportunity Assessment Form				
ID Number: 018		Revision: 00		Last Date Evaluated: 16-Oct-06
Status: Active				
Event Title: Product Must Go to a Different Receipt Tank				
Type: Risk			Category:	
Assess. Element: 3.0		Title: General		
Responsible Org: -			Contact: Delane Maxwell	Date Identified: 16-Oct-06
Statement of Event: Currently the product from the FBSR process will be transferred to a Tank Farm receipt tank. Evaluation of receipt tanks identified Tank 43 (dissolved solution) and Tank 40 (solids only). During testing required to determine final disposition, an incompatibility is discovered between the FBSR product stream the selected Tank Farm receipt tank. An alternative disposition path is required after design is complete.				
Likelihood:	Unlikely	Basis: An evaluation was performed to identify alternatives to Tank 51 and the required testing. Testing is scheduled to occur as early as possible to identify any problems.		
Consequence / Benefit:	Critical	Basis: New disposition path will have to be identified and design and modification completed. Startup is delayed and additional cost incurred.		
Most Significant Cost Impact (\$k): 250			Most Significant Schedule Impact (Wks): 3 Mths	
Level:	Moderate	Event Trigger:		
Handling Strategy:	Mitigate	Description: Perform testing to confirm compatibility with Tank Farm receipt tank and associated downstream process. Develop a backup plan to identify a tank capable of receiving FBSR product. Identify a transfer path to backup tank. Develop design to enable transfer path ready for issuance should it be required.		
Handling Strategy Action Items:				
018-1 Perform testing to evaluate compatibility of FBSR product stream with selected Tank Farm receipt tank and associated downstream process., , SRNL - Richard Edwards,				
018-2 Develop a backup plan to identify a tank capable of receiving FBSR product. (Note: If further processing of product from the backup tank is problematic, then this should be evaluated as a program issue), , LWO PE - Greg Arthur,				
018-3 Identify a transfer path to backup tank., , LWO PE - Greg Arthur,				
018-4 Develop design to enable transfer path ready for issuance should it be required. (Final decision prior to initiating final design), , DS - Sergio Mazul,				
HS Implementation Cost (\$K):	50	Basis: Cost of evaluation, investigation and design preparation		
HS Implementation Schedule (Wks):	2 Mths	Basis: Duration of evaluation, investigation and design preparation		
Other Handling Strategies:				
Statement of Residual Risk: Product is found to be incompatible and backup plan has to be implemented.				
Residual Likelihood:	Very Unlikely	Basis: The same likelihood exists that the product may be incompatible with DWPF processing.		
Residual Consequence:	Marginal	Basis: Time to complete transfer line design mods and cost of implementation.		
Residual Risk Level:	Low	Residual Impact Basis: Worst Case: Time to complete transfer line design mods and cost of implementation.		
Residual Cost Impact (\$K):	<u>Best Case</u> 50	<u>Most Likely</u> 100	<u>Worst Case</u> 200	
Residual Schedule Impact (Mos):	1 Wk	2 Wks	1 Mth	
Impacted Scope of Work:				
Evaluation Comments:				
Event Comments: Ref PBS-SR-0014 Risk 100.				

Risk / Opportunity Assessment Form			
ID Number: 019		Revision: 00	
		Last Date Evaluated: 16-Oct-06	
Status: Active			
Event Title: Addition of the GAC to Design			
Type: Risk		Category:	
Assess. Element: 1.2.4		Title: OFF-Gas	
Responsible Org: -		Contact: Tim Baughman	
Date Identified: 16-Oct-06			
Statement of Event: Currently it is assumed that a GAC will be not be required in the off-gas stream from FBSR. There are possibilities that a flowsheet could be developed that does require a GAC. GAC will then be added to the design.			
Likelihood:	Very Unlikely	Basis: Preliminary test results from the HAZEN testing indicate that a GAC bed will not be required.	
Consequence / Benefit:	Crisis	Basis: Need to install and maintain a GAC Bed System. Cost of design (including SS controls, PDSA rework etc.). Schedule delay to implement.	
Most Significant Cost Impact (\$k): 500		Most Significant Schedule Impact (Wks): 6 Mths	
Level:	High	Event Trigger:	
Handling Strategy:	Mitigate	Description: Complete analysis of Hazen test data and flowsheet development and work with environmental to determine that the GAC bed indeed is not required in sufficient time to minimize schedule impact.	
Handling Strategy Action Items:			
019-1 Complete analysis of Hazen test data and generate calculation or evaluation., , DA - Satish Shah,			
019-2 Complete final flowsheet development (Gene Daniel/ Greg Arthur), , SRNL - Gene Daniel,			
HS Implementation Cost (\$K):	0	Basis: No additional cost is associated with aceleration of flowsheet development and environmental calculations	
HS Implementation Schedule (Wks):	2 Mths	Basis: Time it takes to analyze the data to determine that the GAC bed is not required.	
Other Handling Strategies:			
Statement of Residual Risk: A GAC could still be required.			
Residual Likelihood:	Very Unlikely	Basis: Likelihood of requireing a GAC has not been reduced.	
Residual Consequence:	Significant	Basis:	
Residual Risk Level:	Low	Residual Impact Basis: Worst Case: A GAC is required and 3 mths duration of design and procurement	
Residual Cost Impact (\$K):	<u>Best Case</u> 500	<u>Most Likely</u> 500	<u>Worst Case</u> 500
Residual Schedule Impact (Mos):	2 Mths	2 Mths	3 Mths
Most Likely Case: A GAC is required and 2 mths duration of design and procurement Best Case: A GAC is required and 2 mths duration of design and procurement			
Impacted Scope of Work:			
Evaluation Comments:			
Event Comments:			

Risk / Opportunity Assessment Form				
ID Number: 020		Revision: 00		Last Date Evaluated: 16-Oct-06
Status: Active				
Event Title: Analysis of 241-96H Structure Shows Not-Qualified for PC-3				
Type: Risk			Category:	
Assess. Element: 2.2.1		Title: Building 241-96H Structure		
Responsible Org: -			Contact: DS - Sergio Mazul	Date Identified: 16-Oct-06
Statement of Event: It is assumed that Building 241-96H will be qualified as a PC-3 designed structure. Analysis determines that Building 241-96H is not qualified. Project cannot use Building 241-96H without modification.				
Likelihood:	Likely	Basis: The existing structure was not designed for PC-3 loads		
Consequence / Benefit:	Significant	Basis: Project cannot use Building 241-96H without modification		
Most Significant Cost Impact (\$k): 250			Most Significant Schedule Impact (Wks): 2 Mths	
Level:	Moderate	Event Trigger:		
Handling Strategy:	Mitigate	Description: Perform the PC-3 Analysis during preliminary design to identify impacts prior to baselining the project.		
Handling Strategy Action Items: 020-1 Perform the PC-3 Analysis during preliminary design to identify impacts prior to baselining the project, , DS - Sergio Mazul,				
HS Implementation Cost (\$K):	0	Basis: The analysis is already part of the project baseline		
HS Implementation Schedule (Wks):	0	Basis: Will be included schedule baseline with earlier start date.		
Other Handling Strategies:				
Statement of Residual Risk: Mod's will still be required but there will be no impact to the project schedule since they were identified early (\$250K).				
Residual Likelihood:	Likely	Basis: Likelihood has not changed		
Residual Consequence:	Marginal	Basis: Minor modifications are required		
Residual Risk Level:	Moderate	Residual Impact Basis: Worst Case: Modifications are required Most Likely Case: Minor modifications are required Best Case: Minimal modifications are required		
Residual Cost Impact (\$K):	<u>Best Case</u> 75	<u>Most Likely</u> 125	<u>Worst Case</u> 250	
Residual Schedule Impact (Mos):	0	0	0	
Impacted Scope of Work:				
Evaluation Comments:				
Event Comments:				

Risk / Opportunity Assessment Form				
ID Number: 022		Revision: 00		Last Date Evaluated: 16-Oct-06
Status: Active				
Event Title: Interfaces With New Contractor Impacts Project				
Type: Risk			Category:	
Assess. Element: 3.0		Title: General		
Responsible Org: -			Contact: PM - Jon Lunn	Date Identified: 16-Oct-06
Statement of Event: The TTP Project will have a subcontractor that has not been used at SRS. Design and contractual requirements with a new subcontractor results in delays or changes in assumed equipment interfaces. Schedule delay and rework costs.				
Likelihood:	Unlikely	Basis: The FBSR contract has not been awarded and magnitude and details of the equipment interfaces have not been fully resolved.		
Consequence / Benefit:	Significant	Basis: Delay to contract award and project. Additional costs involved with resolution of facility interfaces and preliminary design. (above those assumed in the BDER estimate)		
Most Significant Cost Impact (\$k): 1,000			Most Significant Schedule Impact (Wks): 2 Mths	
Level:	Moderate	Event Trigger:		
Handling Strategy:	Reduce/ Mitigate	Description: Ensure early involvement of subcontractor in preliminary design. Expedite preliminary design.		
Handling Strategy Action Items:				
022-1 Ensure early involvement of subcontractor in preliminary design., , PM - Jon Lunn,				
022-2 Facilitate early acquisition of contract and expedite completion and integration of subcontractor's preliminary design, , PM - Jon Lunn,				
HS Implementation Cost (\$K):	50	Basis: The cost of involving subcontractor prior to award of equipment sub-contract.		
HS Implementation Schedule (Wks):	4 Mths	Basis: The period of time subcontractor will be actively involved prior to award of equipment sub-contract.		
Other Handling Strategies:				
Statement of Residual Risk: Even with early subcontractor involvement some problems may occur.				
Residual Likelihood:	Very Unlikely	Basis: Likelihood is reduced by early involvement of subcontractor.		
Residual Consequence:	Marginal	Basis: Additional cost and schedule impact to resolve minor issues with facility interfaces		
Residual Risk Level:	Low	Residual Impact Basis: Worst Case: Additional cost and schedule impact to resolve issues with facility interfaces		
Residual Cost Impact (\$K):	<u>Best Case</u> 0	<u>Most Likely</u> 250	<u>Worst Case</u> 500	Most Likely Case: Additional cost and schedule impact to resolve minor issues with facility interfaces
Residual Schedule Impact (Mos):	0	2 Wks	1 Mth	Best Case: Issues arise with facility interfaces
Impacted Scope of Work:				
Evaluation Comments:				
Event Comments:				

Risk / Opportunity Assessment Form			
ID Number: 023		Revision: 00	
Last Date Evaluated: 16-Oct-06		Status: Active	
Event Title: Design Assumptions and Design Uncertainties Result In Rework			
Type: Risk		Category:	
Assess. Element: 3.0		Title: General	
Responsible Org: -		Contact: DS - Sergio Mazul	Date Identified: 16-Oct-06
<p>Statement of Event: Assumptions are made at the Conceptual Design Stage. One or more of these assumptions (see TR&C document Section 1.5) is determined to be incorrect. Design must be changed to resolve discrepancy.</p> <p>Several of the assumptions in the TR&C Section 1.5 have been singled out as individual risks. The following remain:</p> <ul style="list-style-type: none"> • It is assumed that a new electrical substation will not be required. • The 241-96H D&R work will be complete and sufficient space will be available and prepared to install the FBSR unit in 241-96H. • The existing stack at 241-96H will be sufficient to protect personnel from gases released during the FBSR process. • The FBSR Process will be monitored and controlled from the 3H Control Room (Building 241-2H) via the existing Liquid Waste Control Network (LWCN) Distributed Control System (DCS). The LWCN DCS has adequate capacity to handle the additional controller and I/O associated with the FBSR Process. • The existing slurry pumps and other equipment will be available to mix the bulk contents of Tank 48. • New slurry pump VFDs will be provided for Tank 48 by a separate SWPF project to support FBSR operation. • The plant capacity will be achieved using a 20 inch DMR, assuming 75% utility. • The existing PIE System has adequate capacity for storage of FBSR process data. 			
Likelihood:	Unlikely	Basis: This design is new to SRS and assumptions have been made during conceptual design, that if proven incorrect may result in major re-design.	
Consequence / Benefit:	Crisis	Basis: The worst case impact would be that the process cannot fit inside 241-96H without significant modification to the Building.	
Most Significant Cost Impact (\$k): 5,000		Most Significant Schedule Impact (Wks): 1 Yr	
Level:	High	Event Trigger:	
Handling Strategy:	Reduce/ Mitigate	<p>Description: Determine the need for new electrical substation; Define spacial limitations clearly in procurement specification; Perform an HVAC study to determine the adequacy of the existing system and develop and issue a viable automation and controls strategy.</p> <p>Verify the existing slurry pumps and other equipment will be available to mix the bulk contents of Tank 48 and that new slurry pump VFDs for Tank 48 will be available to support FBSR operation.</p>	
Handling Strategy Action Items:			
023-1 Define spacial limitations clearly in procurement specification and provide sufficient margin for minor design changes that may be required., , DS - Sergio Mazul,			
023-2 Perform an evaluation/study of electrical power supply as early as possible in the project to determine the need for an electrical substation., , DS - Sergio Mazul,			
023-3 Develop and issue a viable automation and controls strategy for the FBSR Project., , P&CS - Kay Bures,			
023-4 Verify the existing slurry pumps and other equipment will be available to mix the bulk contents of Tank 48., , LWFO - Mike Borders,			
023-5 Ensure project to install new slurry pump VFDs for Tank 48 is being implemented to support FBSR operation., , PO - Charles Lampley,			
HS Implementation Cost (\$K):	0	Basis: No additional cost to project	
HS Implementation Schedule (Wks):	0	Basis: Within project baseline schedule	
Other Handling Strategies:			
Statement of Residual Risk: The risk of encountering space problems within 241-96H can be avoided with the handling strategy. The worst case residual risk would be determining the need for new electrical substation.			

Risk / Opportunity Assessment Form

ID Number: 023 **Revision:** 00 **Last Date Evaluated:** 16-Oct-06 **Status:** Active

Residual Likelihood:	Unlikely	Basis: Likelihood of design assumptions being incorrect remains the same.				
Residual Consequence:	Significant	Basis: Most Likely Case: Some assumptions are partially incorrect requiring some re-design.				
Residual Risk Level:	Moderate	Residual Impact Basis: Worst Case: Study determines the need for new electrical substation. Schedule impact has been eliminated by early identification. Most Likely Case: Some assumptions are partially incorrect requiring some re-design Best Case: Any incorrect assumptions can be accomodated for in design, however schedule delay is not avoided.				
Residual Cost Impact (\$K):	<u>Best Case</u> 0				<u>Most Likely</u> 125	<u>Worst Case</u> 250
Residual Schedule Impact (Mos):	2 Mths				2 Mths	3 Mths
Impacted Scope of Work:						
Evaluation Comments:						
Event Comments:						

Risk / Opportunity Assessment Form				
ID Number: 024		Revision: 00		Last Date Evaluated: 16-Oct-06
Status: Active				
Event Title: Insufficient Maintainability Provided				
Type: Risk			Category:	
Assess. Element: 3.0		Title: General		
Responsible Org: -			Contact: DS - Sergio Mazul	Date Identified: 16-Oct-06
Statement of Event: Design changes are required after the RDSR identifies maintainability issues.				
Likelihood:	Likely	Basis: First of a kind system at SRS and therefore maintainability is an unknown		
Consequence / Benefit:	Critical	Basis: Design changes to the FBSR skid due to maintainability issues. Cost and schedule impact.		
Most Significant Cost Impact (\$k): 500			Most Significant Schedule Impact (Wks): 3 Mths	
Level:	High	Event Trigger:		
Handling Strategy:	Reduce	Description: Have Maintenance, Ops and Rad Con involved in the design to ID and resolve issues during the design of the skid.		
Handling Strategy Action Items: 024-1 Have Maintenance, Ops and Rad Con involved in the design to ID and resolve issues during the design of the skid., , , DS - Sergio Mazul,				
HS Implementation Cost (\$K):	5	Basis: Additional cost of maintenance, operations and Rad Con design reviews		
HS Implementation Schedule (Wks):	0	Basis: Can be performed in parallel with already scheduled design reviews		
Other Handling Strategies:				
Statement of Residual Risk: A design change may still be required to provide the required maintainability				
Residual Likelihood:	Unlikely	Basis: Likelihood has decreased based on employing additional design reviews.		
Residual Consequence:	Marginal	Basis: Any minor change will cost dollars and schedule.		
Residual Risk Level:	Low	Residual Impact Basis: Worst Case: Design modification. Cost and schedule impact.		
Residual Cost Impact (\$K):	<u>Best Case</u> 10	<u>Most Likely</u> 50	<u>Worst Case</u> 100	Most Likely Case: Small design modification. Cost and schedule impact. Best Case: Minor design modification. Cost and schedule impact.
Residual Schedule Impact (Mos):	1 wk	2 Wks	1 Mth	
Impacted Scope of Work:				
Evaluation Comments:				
Event Comments:				

Risk / Opportunity Assessment Form				
ID Number: 027		Revision: 00		Last Date Evaluated: 16-Oct-06
Status: Active				
Event Title: Availability of Consumables				
Type: Risk			Category:	
Assess. Element: 2.2		Title: Support Systems		
Responsible Org: -			Contact: Keith Albertson	Date Identified: 16-Oct-06
Statement of Event: Consumables are scheduled to be delivered to support testing, startup and operations. Delivery of consumables is held up (i.e. More than 1 week delay). Testing, startup and operation cannot continue without consumables.				
Likelihood:	Likely	Basis: Access to consumables, such as fuses, lamps, incidentals, and raw material (i.e., chemical, etc.), are contingent upon expected life of the components, expenditure of materials, stores availability and storage capabilities, as well as availability and delivery methods of suppliers. Historically, a four to eight week turn around on common raw material procurement and delivery is not unusual.		
Consequence / Benefit:	Significant	Basis: Delay in material receipts of greater than one week will result in potential prolonged outages and reduced production.		
Most Significant Cost Impact (\$k): 0			Most Significant Schedule Impact (Wks): 8 Wks	
Level:	Moderate	Event Trigger:		
Handling Strategy:	Reduce/Mitigate	Description: Perform identification of critical spares/resources. Set up parts in stores. Where practical, consumables critical to this project and with lead times greater than one week shall be set up in site stores.		
Handling Strategy Action Items:				
027-1 Where practical, consumables critical to this project and with lead times greater than one week shall be set up in site stores or purchased in advance., , DA - Mike Augeri,				
027-2 Identify primary and secondary suppliers/vendors of unique consumables which can not be maintained in site stores., , DA - Mike Augeri,				
HS Implementation Cost (\$K):	50	Basis: 40 hours design authority engineering to research and identify. 40 hours procurement to set up in FMTS. 20 hour QA to validate. Capital cost of initial consumables resourcing.		
HS Implementation Schedule (Wks):	2.5	Basis: Two week and 20 hours running concurrence to design closure. Activities should not extend end dates. 40 engineering hours. 40 exempt procurement hours. 20 QA Exempt hours.		
Other Handling Strategies:				
Statement of Residual Risk: With critical parts and spares on hand, the remaining risk is limited to major consumables suchas chemicals and cold feeds.				
Residual Likelihood:	Unlikely	Basis: The likelihood has been reduced by the identification and procurement of additional consumables that can be kept on hand.		
Residual Consequence:	Marginal	Basis: Process chemicals are delayed one week.		
Residual Risk Level:	Low	Residual Impact Basis: Worst Case: Process chemicals are delayed one week.		
Residual Cost Impact (\$K):	<u>Best Case</u> 0	<u>Most Likely</u> 0	<u>Worst Case</u> 0	Most Likely Case: Process chemicals are delayed one week. Best Case: Process chemicals are delayed one week.
Residual Schedule Impact (Mos):	1 Wk	1 Wk	1 Wk	
Impacted Scope of Work:				
Evaluation Comments:				
Event Comments:				

Risk / Opportunity Assessment Form				
ID Number: 028		Revision: 01		Last Date Evaluated: 16-Jun-08
Status: Active				
Event Title: Waste Feed Nozzle Deposits				
Type: Risk			Category:	
Assess. Element: 1.2.1		Title: Feed System		
Responsible Org: -			Contact: Satish Shah	Date Identified: 23-Oct-06
Statement of Event: Currently it is assumed that: feed nozzle design is acceptable; nozzle clearing methods, (flush with water or acid) demonstrated during testing, are effective. During Site Acceptance Testing (SAT) deposits form on the waste feed nozzle to the DMR and the nozzle clogs interrupting/delaying SAT. SAT cannot be completed until problem is resolved.				
Likelihood:	Likely	Basis: Tank 48 simulant feed did clog the nozzles during Hazen testing		
Consequence / Benefit:	Significant	Basis: Redesign of nozzles/cleaning methods		
Most Significant Cost Impact (\$k): 200			Most Significant Schedule Impact (Wks): 8 Wks	
Level:	Moderate	Event Trigger:		
Handling Strategy:	Reduce	Description: Perform ESTD testing with Tank 48 simulant. Engineering Scaled Testing Lessons Learned will be incorporated into clean in place design. Inspect DMR feed nozzle for deposits after ESTD testing.		
Handling Strategy Action Items:				
028-1 Perform ESTD testing with Tank 48 simulant., , DA - Satish Shah,				
028-2 Incorporate Engineering Scaled Testing Lessons Learned into clean in place design., , DA - Satish Shah,				
028-5 Inspect DMR feed nozzle for deposits after ESTD testing., , DA - Satish Shah,				
028-8 Review Hazen test results and evaluate the need for more robust clean in place system., , DA - Satish Shah,				
HS Implementation Cost (\$K):	0	Basis: Testing is within the current cost baseline.		
HS Implementation Schedule (Wks):	0	Basis: Testing is included in the current schedule.		
Other Handling Strategies:				
Statement of Residual Risk: The likelihood of nozzle deposits impacting performance still exists to a lessened degree.				
Residual Likelihood:	Unlikely	Basis: The likelihood of nozzle deposits impacting performance has been reduced.		
Residual Consequence:	Significant	Basis: Delay and cost of minor rework		
Residual Risk Level:	Moderate	Residual Impact Basis: Worst Case: Delay and cost of nozzle rework Most Likely Case: Delay and cost of minor rework Best Case: Delay and cost of minor rework		
Residual Cost Impact (\$K):	<u>Best Case</u> 50	<u>Most Likely</u> 100	<u>Worst Case</u> 200	
Residual Schedule Impact (Mos):	2 Wks	4 Wks	8 Wks	
Impacted Scope of Work:				
Evaluation Comments:				
Event Comments: Modified action Items 1, 2, 5 and deleted action items 3, 4, 6 and 7 as they will no longer be performed. New action item 8 added.				

Risk / Opportunity Assessment Form				
ID Number: 029		Revision: 00		Last Date Evaluated: 23-Oct-06
Status: Active				
Event Title: Scale-up of FBSR Process Encounters Problems (LLWDSP ISSUE)				
Type: Risk			Category:	
Assess. Element: 1.0		Title: Processing		
Responsible Org: -			Contact: Satish Shah	Date Identified: 23-Oct-06
Statement of Event: Scale-up of the steam reforming process to treat Tank 48 could result in lower throughputs than planned in the design.				
Likelihood:	Unlikely	Basis: The scale-up capacity from the Hazen unit to other designs has been performed in the past and is likely to be well understood.		
Consequence / Benefit:	Crisis	Basis: Delay in schedule for Tank 48 return to service.		
Most Significant Cost Impact (\$k): 0			Most Significant Schedule Impact (Wks): 1 Yr	
Level:	High	Event Trigger:		
Handling Strategy:	Avoid	Description: The Hazen tests will validate design flow rates of Tank 48 simulate feed. Expected flow rate will be based on a smaller 15" DMR bed unit. The design for the Tank 48 unit will be a 20" bed DMR. The inability of the scaled-up FBSR to meet throughput requirements is not considered a risk to the project, however this is an issue that will impact the LLWDSP.		
Handling Strategy Action Items:				
029-1 Use the Hazen test results to validate design flow rates of Tank 48 simulate feed., , DA - Satish Shah,				
029-2 Expected flow rate will be based on a smaller 15" DMR bed unit. The design for the Tank 48 unit will be a 20" bed DMR, , DA - Satish Shah,				
HS Implementation Cost (\$K):	0	Basis: No additional cost to project		
HS Implementation Schedule (Wks):	0	Basis: Will be accomodated in existing scheduled tests		
Other Handling Strategies:				
Statement of Residual Risk: The throughput of the FBSR may still be impcated by scaleup issues. The inability of the scaled-up FBSR to meet throughput requirements is is not considered a risk to the project, however this is an issue that will impact the LWDPP.				
Residual Likelihood:		Basis:		
Residual Consequence:		Basis:		
Residual Risk Level:			Residual Impact Basis:	
Residual Cost Impact (\$K):	<u>Best Case</u> 0	<u>Most Likely</u> 0	<u>Worst Case</u> 0	
Residual Schedule Impact (Mos):	0	0	0	
Impacted Scope of Work:				
Evaluation Comments:				
Event Comments: The inability of the scaled-up FBSR to meet throughput requirements is not considered a risk to the project, however this is an issue that will impact the LLWDSP. This issue should be evaluated by the PIT group for impact to the LLWDSP. (Reference PBS-0014, Risk-122)				

Risk / Opportunity Assessment Form			
ID Number: 033		Revision: 00	
		Last Date Evaluated: 23-Oct-06	
Status: Active			
Event Title: Long Lead Procurement is Denied or Delayed			
Type: Risk		Category:	
Assess. Element: 2.0		Title: Project	
Responsible Org: -		Contact: PM - Jon Lunn	
Date Identified: 23-Oct-06			
Statement of Event: Long lead procurements are part of the TTP Project. Long lead procurements are not approved by DOE or are delayed. Project is delayed			
Likelihood:	Unlikely	Basis: DOE Order 413.3 allows for early approvals for long lead procurements	
Consequence / Benefit:	Crisis	Basis: Non-approval would result in delay to project.	
Most Significant Cost Impact (\$k): 0		Most Significant Schedule Impact (Wks): 26 Wks	
Level:	High	Event Trigger:	
Handling Strategy:	Reduce	Description: Include strategy for request for early approvals of long lead procurements in CD-0 and CD-1 in order to obtain early agreement of DOE with strategy.	
Handling Strategy Action Items:			
033-1 Include project strategy for requesting early approvals of long lead procurements in CD-1 and obtaining DOE approval., , PM - Jon Lunn,			
HS Implementation Cost (\$K):	0	Basis: Development of Critical Decision packages are required for this project and strategy for early release of procurement/construction activities is included in the CD packages. No additional cost will be incurred by the Project.	
HS Implementation Schedule (Wks):	0	Basis: CD approval by DOE is within the current schedule.	
Other Handling Strategies:			
Statement of Residual Risk: Even with early submittal for long-lead procurement items, a risk remains that DOE may not approve early release of procurement. The Project would be re-baselined and any additional cost due to the change in strategy added to the baseline cost of the project through a suitable change control mechanism.			
Residual Likelihood:		Basis:	
Residual Consequence:		Basis:	
Residual Risk Level:		Residual Impact Basis:	
Residual Cost Impact (\$K):	<u>Best Case</u>	<u>Most Likely</u>	<u>Worst Case</u>
Residual Schedule Impact (Mos):			
Impacted Scope of Work:			
Evaluation Comments:			
Event Comments:			

Risk / Opportunity Assessment Form				
ID Number: 034		Revision: 00		Last Date Evaluated: 23-Oct-06
Status: Active				
Event Title: Particle Size Control Problems				
Type: Risk			Category:	
Assess. Element: 1.2.1		Title: Feed System		
Responsible Org: -			Contact: Satish Shah	Date Identified: 23-Oct-06
Statement of Event: Feed through nozzles to DMR requires particle size control. Design does not adequately control particle size. DMR cannot be operated and process requires a design change to resolve problem.				
Likelihood:	Likely	Basis: Tank 48 is likely to have some particle sizes greater than what was used during simulant testing.		
Consequence / Benefit:	Significant	Basis: Plugged feed system requiring redesign.		
Most Significant Cost Impact (\$K): 200			Most Significant Schedule Impact (Wks): 2 Mths	
Level:	Moderate	Event Trigger:		
Handling Strategy:	Avoid	Description: Screen placed at the suction of Tank 48 transfer pump to prevent large particle from entering the feed nozzle.		
Handling Strategy Action Items: 034-1 Design a screen to be placed at the suction of Tank 48 transfer pump to prevent large particle from entering the feed nozzle., , , DS - Sergio Mazul,				
HS Implementation Cost (\$K):	0	Basis: Transfer pump suction screen is within the project baseline.		
HS Implementation Schedule (Wks):	0	Basis: No additional cost to pump design		
Other Handling Strategies:				
Statement of Residual Risk: Risk has been avoided.				
Residual Likelihood:		Basis:		
Residual Consequence:		Basis:		
Residual Risk Level:		Residual Impact Basis:		
Residual Cost Impact (\$K):	<u>Best Case</u> 0	<u>Most Likely</u> 0	<u>Worst Case</u> 0	
Residual Schedule Impact (Mos):	0	0	0	
Impacted Scope of Work:				
Evaluation Comments:				
Event Comments:				

Risk / Opportunity Assessment Form			
ID Number: 038		Revision: 02	Last Date Evaluated: 16-Jun-08
Status: Active			
Event Title: Availability Cannot be Achieved (LLWDSP ISSUE)			
Type: Risk		Category:	
Assess. Element: 1.0		Title: Processing	
Responsible Org: -		Contact: Paul Carroll	Date Identified: 23-Oct-06
Statement of Event: The FBSR design assumes a 75% attainment. Actual operation of the process cannot reach availability/attainment goals. Re-design will be required to meet availability/attainment goals.			
Likelihood:	Unlikely	Basis: The FBSR process is a "first of a kind" for SRS. First of a kind processes usually have unanticipated attainment problems during startup and commissioning.	
Consequence / Benefit:	Critical	Basis: Failure to achieve attainment will result in a longer processing period for Tank 48 contents. If detected during testing and cold runs it would result in a delay to Project completion while vendor corrected problem.	
Most Significant Cost Impact (\$k): 0		Most Significant Schedule Impact (Wks): 3 Mths	
Level:	Moderate	Event Trigger:	
Handling Strategy:	Reduce/ Mitigate	Description: Vendor is required to perform a RAMI analysis on the system. Have Vendor engineers on hand during vendor testing, startup and cold runs.	
Handling Strategy Action Items:			
038-1 Arrange for Vendor Engineers to be present during SAT, startup and cold runs., , DA - Mike Augeri,			
038-2 Identify specific unit operations that would potentially benefit from a mockup., , DA - Mike Augeri,			
038-3 Perform mockup, troubleshoot and streamline unit ops as required., , DA - Mike Augeri,			
038-4 Require that the vendor perform a RAMI analysis to validate the attainment requirements of the system can be met., , DS - Sergio Mazul,			
HS Implementation Cost (\$K):	100	Basis: Cost of Vendor Engineers' support, mockup testing and rework.	
HS Implementation Schedule (Wks):	2 Mths	Basis: Duration of activities	
Other Handling Strategies:			
Statement of Residual Risk: After streamlining operations as much as feasible, a risk of not being to reach 75% attainment may still exist. The inability of the scaled-up FBSR to meet throughput requirements is not considered a risk to the project, however this is an issue that will impact the LLWSDP. This issue should be evaluated by the PIT group for impact to the LLWSDP.			
Residual Likelihood:		Basis:	
Residual Consequence:		Basis:	
Residual Risk Level:		Residual Impact Basis:	
Residual Cost Impact (\$K):	<u>Best Case</u>	<u>Most Likely</u>	<u>Worst Case</u>
Residual Schedule Impact (Mos):			
Impacted Scope of Work:			
Evaluation Comments:			
Event Comments: Action Item 1 modified, action item 4 added, and action items 2 and 3 deleted as they are no longer being performed. The inability of the scaled-up FBSR to meet availability requirements is not considered a risk to the project if realized after cold runs and testing, however this is an issue that will impact the LLWSDP. This issue should be evaluated by the Planning Group for impact to the LLWSDP. (Reference PBS-SR-0014, Risk- 122)			

Risk / Opportunity Assessment Form				
ID Number: 042		Revision: 00		Last Date Evaluated: 23-Oct-06
Status: Active				
Event Title: Discovery of Soil Contamination				
Type: Risk			Category:	
Assess. Element: 2.0		Title: Project		
Responsible Org: -			Contact: Mary Pallon	Date Identified: 23-Oct-06
Statement of Event: Excavations will be performed in and around Building 241-96H. Previously undetected or undocumented contamination is found during excavation. Excavation is delayed.				
Likelihood:	Unlikely	Basis: Based on the history of the area to be excavated.		
Consequence / Benefit:	Significant	Basis: Cost to develop new plans and strategies and to perform construction with radiological controls.		
Most Significant Cost Impact (\$k): 500			Most Significant Schedule Impact (Wks): 2 Mths	
Level:	Moderate	Event Trigger:		
Handling Strategy:	Mitigate	Description: Perform early soil samples		
Handling Strategy Action Items: 042-1 Perform early soil samples., , Con - Mary Pallon,				
HS Implementation Cost (\$K):	5 K	Basis: Cost of several soil samples		
HS Implementation Schedule (Wks):	2 Wks	Basis: Duration of sampling		
Other Handling Strategies:				
Statement of Residual Risk: Contaminated area may not be avoidable or were not detected.				
Residual Likelihood:	Unlikely	Basis: Likelihood has not been significantly reduced		
Residual Consequence:	Marginal	Basis: Some work requires rad controls, cost and schedule impact		
Residual Risk Level:	Low	Residual Impact Basis: Worst Case: Work requires rad controls, cost and schedule impact		
Residual Cost Impact (\$K):	<u>Best Case</u> 0	<u>Most Likely</u> 100	<u>Worst Case</u> 250	Most Likely Case: Some work requires rad controls, cost and schedule impact Best Case: No rad controls required
Residual Schedule Impact (Mos):	0	2 Wks	1 Mth	
Impacted Scope of Work:				
Evaluation Comments:				
Event Comments:				

Risk / Opportunity Assessment Form				
ID Number: 043		Revision: 01		Last Date Evaluated: 16-Jun-08
Status: Active				
Event Title: Engineered Equipment (Skids) Deliveries do not Support Construction Schedule				
Type: Risk			Category:	
Assess. Element: 2.0		Title: Project		
Responsible Org: -			Contact: DS - Sergio Mazul	Date Identified: 23-Oct-06
Statement of Event: Engineered equipment (modules) are required to be fabricated, component tested and delivered to support the construction schedule. Delivery of equipment does not support the construction schedule. Construction is delayed.				
Likelihood:	Likely	Basis: The Project is a fast track Project with much Engineered Equipment.		
Consequence / Benefit:	Critical	Basis: Project delays and added cost to the Project.		
Most Significant Cost Impact (\$k): 500			Most Significant Schedule Impact (Wks): 3 Mths	
Level:	High	Event Trigger:		
Handling Strategy:	Reduce	Description: Have a FPEG assigned to the Project Team to expedite and track procurements.		
Handling Strategy Action Items:				
HS Implementation Cost (\$K):	50	Basis: Cost of FPEG		
HS Implementation Schedule (Wks):	0	Basis: Duration of FPEG support		
Other Handling Strategies:				
Statement of Residual Risk: May need to pay expediting fees to meet our need dates. (\$200K)				
Residual Likelihood:	Unlikely	Basis: Likelihood of realizing risk has been reduced with the assignment of a FPEG		
Residual Consequence:	Marginal	Basis: Expediting fees are required to avoid schedule impact		
Residual Risk Level:	Low	Residual Impact Basis: Worst Case: Expediting fees are required to avoid schedule impact		
Residual Cost Impact (\$K):	<u>Best Case</u> 0	<u>Most Likely</u> 100	<u>Worst Case</u> 200	Most Likely Case: Expediting fees are required to avoid schedule impact Best Case: Risk is realized, but workarounds can be used
Residual Schedule Impact (Mos):	0	2 Mths	4 Mths	
Impacted Scope of Work:				
Evaluation Comments:				
Event Comments:				

Risk / Opportunity Assessment Form				
ID Number: 046		Revision: 01		Last Date Evaluated: 16-Jun-08
Status: Active				
Event Title: Scaling Occurs in the DMR During Operation (operational vulnerability)				
Type: Risk			Category:	
Assess. Element: 1.2.2		Title: DMR		
Responsible Org: -			Contact: Satish Shah	Date Identified: 23-Oct-06
Statement of Event: Rate of scale formation is unknown. Scaling may lead to blockage of instrumentation sensors within the DMR and loss of through put capacity due to build-up on the DMR wall.				
Likelihood:	Likely	Basis: Build up of material was identified inside the DMR during testing, but may have been caused by different reductant feeds used during earlier testing.		
Consequence / Benefit:	Crisis	Basis: Delay in Tank 48 return to service due to the loss of capacity and shutdowns.		
Most Significant Cost Impact (\$k): 0			Most Significant Schedule Impact (Wks): 20 Wks	
Level:	High	Event Trigger:		
Handling Strategy:	Reduce	Description: Analyze material samples collected from Hazen testing. Inspect DMR for build-up during all testing and develop ops and maintenance procedures for preventing build-up or cleaning during radioactive operation.		
Handling Strategy Action Items:				
046-2 Inspect DMR for build-up during all testing, , , DA - Satish Shah,				
046-3 Develop ops and maintenance procedures for preventing build-up or cleaning during radioactive operation., , , DA - Satish Shah,				
HS Implementation Cost (\$K):	0	Basis: Cost of testing is within the current cost baseline.		
HS Implementation Schedule (Wks):	0	Basis: Testing is within the current schedule baseline.		
Other Handling Strategies:				
Statement of Residual Risk: The residual risk will not impact the project, however will remain as a potential operational vulnerability.				
Residual Likelihood:		Basis:		
Residual Consequence:		Basis:		
Residual Risk Level:		Residual Impact Basis:		
Residual Cost Impact (\$K):	<u>Best Case</u>	<u>Most Likely</u>	<u>Worst Case</u>	
Residual Schedule Impact (Mos):				
Impacted Scope of Work:				
Evaluation Comments:				
Event Comments:				

Risk / Opportunity Assessment Form					
ID Number: 050		Revision: 00		Last Date Evaluated: 23-Oct-06	
				Status: Active	
Event Title: Tank Farm Equipment Failure (LLWSDP ISSUE)					
Type: Risk			Category:		
Assess. Element: 1.0		Title: Processing			
Responsible Org: -			Contact: PO - Charles Lampley	Date Identified: 23-Oct-06	
Statement of Event: The successful processing of Tank 48 waste is dependent upon the ability of the HTF infrastructure to meet FBSR interface demands by having the required support systems and interfacing systems available when needed. If HTF systems are not available when required processing cannot proceed.					
Likelihood:	Unlikely	Basis: The interfacing systems and utilities are aged, however regular, planned preventive maintenance is being performed to maximize their availability and reliability.			
Consequence / Benefit:		Basis: The reliability and availability of HTF infrastructure is beyond the scope of this project. However if these systems fail to be available when required, the LLWSDP will be impacted.			
Most Significant Cost Impact (\$k): 0			Most Significant Schedule Impact (Wks): N/A		
Level:		Event Trigger:			
Handling Strategy:	Accept	Description: This risk is accepted as handling of this risk is presently being performed by Tank Farm operations by establishing system health evaluation of key systems that can impact major processing activities. Implementing the requirements of the evaluation e.g. ensuring adequate spare parts/equipment are identified and on hand is being performed to support facility operations. Completion of this program risk handling strategy will bring the probability and consequence of equipment failure to levels that are acceptable and no longer considered as a risk.			
Handling Strategy Action Items:					
HS Implementation Cost (\$K):		Basis:			
HS Implementation Schedule (Wks):		Basis:			
Other Handling Strategies:					
Statement of Residual Risk:					
Residual Likelihood:		Basis:			
Residual Consequence:		Basis:			
Residual Risk Level:			Residual Impact Basis:		
Residual Cost Impact (\$K):	<u>Best Case</u>	<u>Most Likely</u>			<u>Worst Case</u>
Residual Schedule Impact (Mos):					
Impacted Scope of Work:					
Evaluation Comments:					
Event Comments: The inability of the HTF infrastructure to meet availability and reliability requirements is an issue that will impact the LLWSDP. This issue has been evaluated for impact to the LLWSDP (Ref PBS-SR-0014 - 011) and handling strategies are underway.					

Risk / Opportunity Assessment Form				
ID Number: 052		Revision: 00		Last Date Evaluated: 24-Oct-06
Status: Active				
Event Title: Simulant and Waste Differences Impact Commissioning of FBSR				
Type: Risk			Category:	
Assess. Element: 1.0		Title: Processing		
Responsible Org: -			Contact: Gene Daniel	Date Identified: 24-Oct-06
Statement of Event: Differences between simulant and actual Tank 48 waste create startup difficulties not anticipated, pumps not adequate, low flow rates, etc.				
Likelihood:	Very Unlikely	Basis: Extensive sampling and analysis of Tank 48 material has been performed. Delta between actual and simulant is known.		
Consequence / Benefit:	Crisis	Basis: Project delayed while redesign is performed to correct problem. Additional cost and schedule delay. The equipment would have to be decontaminated, disassembled and modified.		
Most Significant Cost Impact (\$K): 500			Most Significant Schedule Impact (Wks): 26 Wks	
Level:	High	Event Trigger:		
Handling Strategy:	Reduce	Description: To date, extensive simulant development has been performed to reduce the likelihood of this risk being realized and pilot facility testing has been performed. Additional real waste testing will be performed at SRNL.		
Handling Strategy Action Items: 052-1 Perform real waste testing at SRNL., , SRNL - Gene Daniel,				
HS Implementation Cost (\$K):	0	Basis: This is included in the present baseline		
HS Implementation Schedule (Wks):	0	Basis: This is included in the present baseline		
Other Handling Strategies:				
Statement of Residual Risk: Risk may still be realized based on real waste testing results.				
Residual Likelihood:	Very Unlikely	Basis: Likelihood has not been changed		
Residual Consequence:	Critical	Basis: Some redesign is performed to correct problem. Additional cost and schedule delay		
Residual Risk Level:	Moderate	Residual Impact Basis: Worst Case: Major redesign is performed to correct problem. Additional cost and schedule delay		
Residual Cost Impact (\$K):	<u>Best Case</u> 0	<u>Most Likely</u> 250	<u>Worst Case</u> 500	Most Likely Case: Some redesign is performed to correct problem. Additional cost and schedule delay Best Case: Problems are encountered, but they are corrected during startup.
Residual Schedule Impact (Mos):	0	12 Wks	26 Wks	
Impacted Scope of Work:				
Evaluation Comments:				
Event Comments:				

Risk / Opportunity Assessment Form				
ID Number: 055		Revision: 00		Last Date Evaluated: 24-Oct-06
Status: Active				
Event Title: Slurry Pump Limitations Require Alternate or Additional Equipment				
Type: Risk			Category:	
Assess. Element: 1.1		Title: Transfer Waste From Tank 48 to FBSR		
Responsible Org: -			Contact: Tim Baughman	Date Identified: 24-Oct-06
<p>Statement of Event: The flowsheet assumption is that the tank can reach its return to service goal by processing 350,000 gallons. The process planning baseline strategy describes a well-mixed tank to within 2 inches of the bottom. The current low-level operation for a slurry pump is 26 inches off the bottom. A flowsheet evaluation indicates the 26 inch constraint results in greater than 750,000 gallons being processed to return to service. There is a risk that the flowsheet assumptions (adequate mixing at reduced tank levels) cannot be achieved requiring additional equipment to be deployed.</p>				
Likelihood:	Unlikely	<p>Basis: Basis of return to service for Tank 48 is TPB amounts and curie amounts. Numerous studies over many years on tank mixing indicate that high mixer discharge velocity provides increased cleaning radius but overcomes surface tension at low levels resulting in aerosolization of waste which is not allowed. These studies have resulted in the current limitation (26 inches) for mixing in a tank.</p>		
Consequence / Benefit:	Crisis	<p>Basis: Add additional transfer pump. Cost and schedule delay.</p>		
Most Significant Cost Impact (\$k): 1,000			Most Significant Schedule Impact (Wks): 12 Mths	
Level:	High	Event Trigger:		
Handling Strategy:	Mitigate	<p>Description: Perform evaluation to determine if additional mixing is required and develop alternate strategy. Install in-tank turbidity/density meter.</p>		
Handling Strategy Action Items:				
<p>055-1 Develop alternative process strategy and flow sheet that considers the limitations of the existing slurry pumps. May need ability to monitor TPB levels or concentration., , DA - Mike Augeri,</p> <p>055-2 Complete Heel Management Plan, , , DA - Tim Baughman,</p>				
HS Implementation Cost (\$K):	100	<p>Basis: \$100,000 for design and installation of in-tank turbidity meter/density meter. Perform mixing evaluation and development of an alternative process strategy is already within the project cost baseline.</p>		
HS Implementation Schedule (Wks):	0	<p>Basis: Within current schedule</p>		
Other Handling Strategies:				
Statement of Residual Risk: 97% of the original TPB is processed in a shorter time frame. The last 3% may add an additional year to this project.				
Residual Likelihood:	Unlikely	<p>Basis: Likelihood has been improved.</p>		
Residual Consequence:	Significant	<p>Basis: Project will be completed, but an additional year is required.</p>		
Residual Risk Level:	Moderate	<p>Residual Impact Basis: Worst Case: Even with alternate strategy, the project is forced to add additional transfer or mixing pump.</p>		
Residual Cost Impact (\$K):	<u>Best Case</u> 0	<u>Most Likely</u> 0	<u>Worst Case</u> 1,000	<p>Most Likely Case: Project will be completed, but an additional year is required.</p>
Residual Schedule Impact (Mos):	3 Mths	1 Year	1 Year	<p>Best Case: Project completed, but takes an additional 3 months to process last 3%.</p>
Impacted Scope of Work:				
Evaluation Comments:				
Event Comments: Reference PBS-SR-0014, Risk 100.				

Risk / Opportunity Assessment Form				
ID Number: 056		Revision: 00		Last Date Evaluated: 24-Oct-06
Status: Active				
Event Title: Facility Support System Capacity/Life				
Type: Risk			Category:	
Assess. Element: 2.1		Title: Utilities Systems Tie-ins		
Responsible Org: -			Contact: DS - Sergio Mazul	Date Identified: 24-Oct-06
Statement of Event: The design and operation of the FBSR is relies upon site utility systems meeting their design capacities. Site utilities do not meet their performance requirements and are not reliable. FBSR process cannot operate by relying on site utilities. FBSR process is replaced with WAO.				
Likelihood:	Unlikely	Basis: Most of the site utilities are currently being used.		
Consequence / Benefit:	Critical	Basis: Added scope to the project to repair, replace or up grade site utilities.		
Most Significant Cost Impact (\$k): 500			Most Significant Schedule Impact (Wks): 3 Mths	
Level:	Moderate	Event Trigger:		
Handling Strategy:	Mitigate	Description: Determine the utility needs earlier during preliminary design and verify their availability. Have maintance and Ops verify that the utilities are in good working order during the design phase. Schedule impact avoided.		
Handling Strategy Action Items:				
056-1 Determine the utility needs (FBSR and WAO) earlier during preliminary design., , DS - Sergio Mazul,				
056-2 Perform study to verify utilities availability., , DA - Mike Augeri,				
HS Implementation Cost (\$K):	0	Basis: No additional cost as this will be performed as part of design		
HS Implementation Schedule (Wks):	0	Basis: The duration of utilities verification activity. This will be performed early and in parallel with other design activities.		
Other Handling Strategies:				
Statement of Residual Risk: Utilities may still be inadequate, but schedule impact has been avoided.				
Residual Likelihood:	Unlikely	Basis: The likelihood of utilities being inadequate has not been reduced.		
Residual Consequence:	Marginal	Basis: Utilities are found to be inadequate and some modifications are required.		
Residual Risk Level:	Low	Residual Impact Basis: Worst Case: Utilities are found to be inadequate and modifications are required.		
Residual Cost Impact (\$K):	<u>Best Case</u> 0	<u>Most Likely</u> 250	<u>Worst Case</u> 500	Most Likely Case: Utilities are found to be inadequate and some modifications are required.
Residual Schedule Impact (Mos):	0	0	0	Best Case: Utilities are found to be inadequate, but design can accommodate this.
Impacted Scope of Work:				
Evaluation Comments:				
Event Comments:				

Risk / Opportunity Assessment Form						
ID Number: 057		Revision: 00		Last Date Evaluated: 24-Oct-06		
Status: Active						
Event Title: Integration of Multiple Internal Technical Agencies						
Type: Risk			Category:			
Assess. Element: 3.0		Title: General				
Responsible Org: -			Contact: DS - Sergio Mazul	Date Identified: 24-Oct-06		
<p>Statement of Event: The project will require effective coordinated of the following technical agencies interactions and deliverables: Operations, HTF Engineering, Design Engineering, Construction, Transportation, Rigging, RadCon, environmental permitting. The technical interaction between different work groups and disciplines can not be coordinated effectively.</p> <p>Lack of coordination causes delays in the project schedule and ineffective use of resources.</p>						
Likelihood:	Likely	Basis: First of a kind and fast track Project				
Consequence / Benefit:	Critical	Basis: Delays in the project schedule, add costs, and ineffective use of resources.				
Most Significant Cost Impact (\$k): 500			Most Significant Schedule Impact (Wks): 3 Mths			
Level:	High	Event Trigger:				
Handling Strategy:	Reduce	Description: Assign a PEM to coordinate this effort and have regular Engineering Meetings with the total engineering team.				
Handling Strategy Action Items:						
057-1 Assign a PEM to coordinate technical agency integration, , , PO - Charles Lampley,						
057-2 Have regular Engineering Meetings with the total engineering team., , , DS - Sergio Mazul,						
HS Implementation Cost (\$K):	0	Basis: This activity can be performed without any additional cost				
HS Implementation Schedule (Wks):	0	Basis: Throughout the entire project design phase.				
Other Handling Strategies:						
Statement of Residual Risk: Integration problems mat still occur.						
Residual Likelihood:	Unlikely	Basis: The probability of this risk occuring has been reduced with the additional management steps taken.				
Residual Consequence:	Negligible	Basis: Minor integration issues require resolution, design rework, cost and schedule impact.				
Residual Risk Level:	Low	<p>Residual Impact Basis: Worst Case: Integration issues require resolution, design rework, cost and schedule impact.</p> <p>Most Likely Case: Minor integration issues require resolution, design rework, cost and schedule impact.</p> <p>Best Case: Minor integration issues require resolution but do not impact schedule or cost.</p>				
Residual Cost Impact (\$K):	<u>Best Case</u> 0				<u>Most Likely</u> 50	<u>Worst Case</u> 100
Residual Schedule Impact (Mos):	0				1 Wk	2 Wks
Impacted Scope of Work:						
Evaluation Comments:						
Event Comments:						

Risk / Opportunity Assessment Form						
ID Number: 058		Revision: 00		Last Date Evaluated: 24-Oct-06		
Status: Active						
Event Title: Multiple Design Input Documents						
Type: Risk			Category:			
Assess. Element: 3.0		Title: General				
Responsible Org: -			Contact: DS - Sergio Mazul	Date Identified: 24-Oct-06		
Statement of Event: The design requirements for the project will be developed and documented in a TR&C and the procurement of the process modules will be performed using a procurement specification. Requirements could be omitted or mis-stated in either document causing conflicts between the two documents and eventually installation and operational problems.						
Likelihood:	Very Unlikely	Basis: First of a kind and a fast track Project				
Consequence / Benefit:	Critical	Basis: Delays in the project schedule, add costs, and ineffective use of resources				
Most Significant Cost Impact (\$k): 500			Most Significant Schedule Impact (Wks): 3 Mths			
Level:	Moderate	Event Trigger:				
Handling Strategy:	Reduce	Description: Assign a PEM to coordinate this effort and have regular Engineering Meetings with the total engineering team.				
Handling Strategy Action Items:						
058-1 Assign a PEM to coordinate this effort, , , PO - Charles Lampley,						
058-2 Have regular Engineering Meetings with the total engineering team., , , DS - Sergio Mazul,						
HS Implementation Cost (\$K):	0	Basis: This activity can be performed without any additional cost.				
HS Implementation Schedule (Wks):	0	Basis: Throughout the entire project design phase.				
Other Handling Strategies:						
Statement of Residual Risk: Integration problems may still occur.						
Residual Likelihood:	Very Unlikely	Basis: The probability of this risk occurring has been reduced with the additional management steps taken.				
Residual Consequence:	Negligible	Basis: Minor integration issues require resolution, design rework, cost and schedule impact.				
Residual Risk Level:	Low	Residual Impact Basis: Worst Case: Integration issues require resolution, design rework, cost and schedule impact. Most Likely Case: Minor integration issues require resolution, design rework, cost and schedule impact. Best Case: Minor integration issues require resolution but do not impact schedule or cost.				
Residual Cost Impact (\$K):	<u>Best Case</u> 0				<u>Most Likely</u> 50	<u>Worst Case</u> 100
Residual Schedule Impact (Mos):	0				1 Wk	2 Wks
Impacted Scope of Work:						
Evaluation Comments:						
Event Comments:						

Risk / Opportunity Assessment Form				
ID Number: 059		Revision: 00		Last Date Evaluated: 24-Oct-06
Status: Active				
Event Title: Undefined Disposal Method for Waste Generated During Operations and Eventual D&R				
Type: Risk			Category:	
Assess. Element: 3.0		Title: General		
Responsible Org: -			Contact: Mike Augeri	Date Identified: 24-Oct-06
Statement of Event: Additional waste e.g. filters, failed components etc., will require disposal during operations and a disposal path for equipment from eventual D&R of the FBSR process should be identified during the design phase. No disposal path for additional waste can be found and aspects of the design which are necessary to assist in D&R have not been incorporated.				
Likelihood:	Very Likely	Basis: Likely that filters, failed components etc., will require replacement during 2 years of operation. This equipment has not been qualified for disposal in solid waste.		
Consequence / Benefit:	Significant	Basis: A waste disposition path would have to be identified prior to filter removal. Once approved, filter could be removed, disposed of and the process restarted.		
Most Significant Cost Impact (\$k): 50 K			Most Significant Schedule Impact (Wks): 1 Mths	
Level:	High	Event Trigger:		
Handling Strategy:	Reduce	Description: Identify disposal path upfront in preparation for filter replacement		
Handling Strategy Action Items:				
059-1 Add Waste Disposal Plan update to the Project Schedule., , PM - Jon Lunn,				
059-2 Identify disposal path upfront in preparation for filter replacement in Waste Disposal Plan update., , DA - Mike Augeri,				
HS Implementation Cost (\$K):	50	Basis: Cost to develop procedures and to identify and approve disposal path.		
HS Implementation Schedule (Wks):	1 Mth	Basis: Time to identify, approve and ready disposal path.		
Other Handling Strategies:				
Statement of Residual Risk: Identifying a disposal path reduces the risk considerably, however during implementation of the disposal, problems may need resolving.				
Residual Likelihood:	Very Unlikely	Basis: Identifying a disposal path reduces the risk considerably		
Residual Consequence:	Negligible	Basis: Cost of resolving implementation problems		
Residual Risk Level:	Low	Residual Impact Basis: Worst Case: Problems occur with implementation and are resolved with some impact.		
Residual Cost Impact (\$K):	<u>Best Case</u> 0	<u>Most Likely</u> 25	<u>Worst Case</u> 50	Most Likely Case: Problems occur with implementation and are resolved with some impact.
Residual Schedule Impact (Mos):	0	0	0	Best Case: Minor problems occur with implementation and are resolved with no impact.
Impacted Scope of Work:				
Evaluation Comments:				
Event Comments:				

Risk / Opportunity Assessment Form				
ID Number: 061		Revision: 00		Last Date Evaluated: 24-Oct-06
				Status: Active
Event Title: Facility Space Limitations				
Type: Risk			Category:	
Assess. Element: 2.2.1		Title: Building 241-96H Structure		
Responsible Org: -			Contact: DS - Sergio Mazul	Date Identified: 24-Oct-06
Statement of Event: The FBSR process will be installed within Building 241-96H. The available space within the building is insufficient to house the process.				
Likelihood:	Very Unlikely	Basis: Preliminary data from the FBSR Vendor indicates that there is sufficient space to house the process.		
Consequence / Benefit:	Crisis	Basis: The Project would not be a viable option		
Most Significant Cost Impact (\$k): 50,000			Most Significant Schedule Impact (Wks): 2 Years	
Level:	High	Event Trigger:		
Handling Strategy:	Reduce/ Mitigate	Description: Asbuilt available space within the building. Make the space availability a requirement for the FBSR Vendor.		
Handling Strategy Action Items:				
061-1 Asbuilt available space within the building., , DS - Sergio Mazul,				
061-2 Make the space availability a requirement for the FBSR Vendor in the procurement specification, , , DS - Sergio Mazul,				
061-3 Obtain dimensional information at vendor's preliminary design completion., , , DS - Sergio Mazul,				
061-4 Identify additional D&R as applicable, , , DS - Sergio Mazul,				
HS Implementation Cost (\$K):	0	Basis: No additional cost to specify this requirement.		
HS Implementation Schedule (Wks):	0	Basis: Additional requirements will be added during currently scheduled procurement specification development.		
Other Handling Strategies:				
Statement of Residual Risk: Some minor interferences may still occur				
Residual Likelihood:	Very Unlikely	Basis: The likelihood has been reduced but not to non-credible		
Residual Consequence:	Negligible	Basis: Minor re-design and delay		
Residual Risk Level:	Low	Residual Impact Basis: Worst Case: Minor re-design and delay Most Likely Case: Minor re-design and delay Best Case: Minor re-design no schedule impact		
Residual Cost Impact (\$K):	<u>Best Case</u> 0	<u>Most Likely</u> 0	<u>Worst Case</u> 0	
Residual Schedule Impact (Mos):	0	2 Wks	1 Mth	
Impacted Scope of Work:				
Evaluation Comments:				
Event Comments:				

Risk / Opportunity Assessment Form					
ID Number: 062		Revision: 00	Last Date Evaluated: 24-Oct-06		
Status: Active					
Event Title: Project Strategy Does Not Support Tank 48 Return to Service Need (LLWSDP ISSUE)					
Type: Risk		Category:			
Assess. Element: 3.0		Title: General			
Responsible Org: -		Contact: PM - Jon Lunn	Date Identified: 24-Oct-06		
<p>Statement of Event: Tank 48 is required to be placed back in service to support the Life-cycle Liquid Waste Disposition System Plan (LLWSDP). The 241-96H FBSR process is designed to be installed and process Tank 48 contents to allow the tank to be placed back into service when required. A contract strategy must be developed and approved by DOE to be implemented in the timeframe allowed. A contract strategy cannot be developed that will both meet with DOE approval, be fully integrated with the proposed project logic and meet the LLWSDP Tank 48 return to service target date.</p>					
Likelihood:	Very Likely	<p>Basis: Current LLWSDP shows a need date of 2012 for Tk. 48 Return to Service. The current project schedule range and operational duration do not support this date.</p>			
Consequence / Benefit:	Crisis	<p>Basis: If Tank 48 can not be returned to service to support the LLWSDP, future Tank Closure commitments may not be achieved. This is not a risk for the Project, as any extension to the proposed schedule (based on integration of safety basis development logic, vendor activity durations and project integration) will be included as part of establishing a CD-1 Project baseline activity or as a BCP to the existing baseline. However being unable to return Tank 48 to service in accordance with the LLWSDP need is an issue to be resolved by the LWO Planning Group.</p>			
Most Significant Cost Impact (\$k): 0		Most Significant Schedule Impact (Wks): 11 Mths			
Level:	High	Event Trigger:			
Handling Strategy:	Accept	<p>Description: If Tank 48 can not be returned to service to support the LLWSDP, future Tank Closure commitments may not be achieved. This is not a risk for the Project, however it is an issue to be resolved by the LWO Planning Group. (Reference PBS-SR-0014, Risk- 184)</p>			
Handling Strategy Action Items:					
HS Implementation Cost (\$K):		Basis:			
HS Implementation Schedule (Wks):		Basis:			
Other Handling Strategies:					
Statement of Residual Risk:					
Residual Likelihood:		Basis:			
Residual Consequence:		Basis:			
Residual Risk Level:		Residual Impact Basis:			
Residual Cost Impact (\$K):	<u>Best Case</u>			<u>Most Likely</u>	<u>Worst Case</u>
Residual Schedule Impact (Mos):					
Impacted Scope of Work:					
Evaluation Comments:					
<p>Event Comments: If Tank 48 can not be returned to service to support the LLWSDP, future Tank Closure commitments may not be achieved. This is not a risk for the Project, however it is an issue to be resolved by the LWO Planning Group. (Reference PBS-SR-0014, Risk- 184)</p>					

Risk / Opportunity Assessment Form				
ID Number: 063		Revision: 00		Last Date Evaluated: 24-Oct-06
Status: Active				
Event Title: FBSR Equipment Transportation				
Type: Risk			Category:	
Assess. Element: 2.0		Title: Project		
Responsible Org: -			Contact: DS - Sergio Mazul	Date Identified: 24-Oct-06
Statement of Event: The FBSR modules are to be transported to SRS using a commercial haulage contractor. The modules cannot be transported without a special vehicle or highway infrastructure. Project is delayed.				
Likelihood:	Very Unlikely	Basis: Transportation requirements are known and a special vehicle can be made available.		
Consequence / Benefit:	Significant	Basis: Project is delayed.		
Most Significant Cost Impact (\$k): 100			Most Significant Schedule Impact (Wks): 4 Weeks	
Level:	Low	Event Trigger:		
Handling Strategy:	Mitigate	Description: Plan up front in the design of the skids and coordinate with the Vendor to ensure special vehicles are available. Perform receipt inspection.		
Handling Strategy Action Items:				
063-1 Plan up front in the design of the skids, , , DS - Sergio Mazul,				
063-2 Coordinate with the Vendor to ensure special vehicles are available., , , PM - Jon Lunn,				
063-3 Perform receipt inspection of FBSR skids and equipment., , , QA - Bruce Dragon,				
063-4 Review shipping precautions for refractory shipping., , , DS - Sergio Mazul,				
HS Implementation Cost (\$K):	0	Basis: This cost is already within the project baseline, the work will be done earlier.		
HS Implementation Schedule (Wks):	0	Basis: Duration of skid design.		
Other Handling Strategies:				
Statement of Residual Risk: During receipt inspection damage may be detected.				
Residual Likelihood:	Very Unlikely	Basis: Likelihood has not been decreased.		
Residual Consequence:	Marginal	Basis: Some delay is realized while minor repairs are performed		
Residual Risk Level:	Low	Residual Impact Basis: Worst Case: Delay is realized while repairs are performed		
Residual Cost Impact (\$K):	<u>Best Case</u> 0	<u>Most Likely</u> 50	<u>Worst Case</u> 100	Most Likely Case: Some delay is realized while minor repairs are performed
Residual Schedule Impact (Mos):	0	2	4	Best Case: Minor repairs can be performed without impact to cost or schedule
Impacted Scope of Work:				
Evaluation Comments:				
Event Comments:				

Risk / Opportunity Assessment Form				
ID Number: 064		Revision: 00		Last Date Evaluated: 24-Oct-06
Status: Active				
Event Title: Multiple External Interfaces				
Type: Risk			Category:	
Assess. Element: 3.0		Title: General		
Responsible Org: -			Contact: PM - Jon Lunn	Date Identified: 24-Oct-06
Statement of Event: The TTP project has multiple external interfaces (e.g. process equipment vendor, oxygen supply unit vendor, vendors for consumables etc.). Integration of these interfaces in ineffective. Delays to the project occur.				
Likelihood:	Likely	Basis: Processes exist for identification and early approval of long lead procurement. Organizations that support this project are subject to conflicting priorities.		
Consequence / Benefit:	Critical	Basis: Delays in receipt of vendor supplied equipment/consumables would impact the project schedule. Delays in key resources could delay project activities.		
Most Significant Cost Impact (\$k): 750			Most Significant Schedule Impact (Wks): 12 Wks	
Level:	High	Event Trigger:		
Handling Strategy:	Reduce	Description: Schedule early approval of long lead procurements to ensure critical vendor information is available in a timely fashion. Integrate project activities into facility schedule. Establish project milestones to manage schedule float and visibility of project priorities.		
Handling Strategy Action Items:				
064-1 Schedule early approval of long lead procurements to ensure critical vendor information is available in a timely fashion., , PM - Jon Lunn,				
064-2 Integrate project activities into facility schedule., , PM - Jon Lunn,				
064-3 Establish project milestones to manage schedule float and visibility of project priorities., , PM - Jon Lunn,				
064-4 Assign a FPEG to coordinate this effort, , PO - Charles Lampley,				
HS Implementation Cost (\$K):	0	Basis: Project strategy in CD-0 is to request early approval of key/long lead procurements.		
HS Implementation Schedule (Wks):	16	Basis: Award of key FBSR subcontract is planned during the early stages of Preliminary Design.		
Other Handling Strategies:				
Statement of Residual Risk: Materials and resources still may not be available when needed.				
Residual Likelihood:	Unlikely	Basis: The likelihood of having resource problems has been reduced by exercising additional project controls.		
Residual Consequence:	Significant	Basis: Project is somewhat impacted by resource problems		
Residual Risk Level:	Moderate	Residual Impact Basis: Worst Case: Project is still impacted by resource problems		
Residual Cost Impact (\$K):	<u>Best Case</u> 0	<u>Most Likely</u> 250	<u>Worst Case</u> 750	Most Likely Case: Project is somewhat impacted by resource problems Best Case: Resource problems occur, but work arounds can be found
Residual Schedule Impact (Mos):	0	4	12 Wks	
Impacted Scope of Work:				
Evaluation Comments:				
Event Comments:				

Risk / Opportunity Assessment Form			
ID Number: 066		Revision: 01	Last Date Evaluated: 16-Jun-08
Status: Active			
Event Title: Emergent Startup Issues			
Type: Risk		Category:	
Assess. Element: 3.0		Title: General	
Responsible Org: -		Contact: Tim Baughman	Date Identified: 24-Oct-06
Statement of Event: There is minimal experience with the FBSR process in the DOE complex, and none at SRS. The FBSRs process is new to SRS. Issues emerge during SRS startup that delay startup and affect operations.			
Likelihood:	Very Likely	Basis: It is likely that issues will emerge during SRS startup that will delay startup and affect operations based on lessons learned from other new first of the kind processes at SRS.	
Consequence / Benefit:	Crisis	Basis: Possible redesigns and delay in Tank 48 return to service.	
Most Significant Cost Impact (\$k): 500		Most Significant Schedule Impact (Wks): 20 Wks	
Level:	High	Event Trigger:	
Handling Strategy:	Reduce/ Mitigate	Description: Perform ESTD testing.	
Handling Strategy Action Items: 066-1 Perform pilot scale testing, , , DA - Mike Augeri, 066-2 Perform ESTD testing., , , DA - Mike Augeri,			
HS Implementation Cost (\$K):	0	Basis: Cost of ESTD testing is within the current baseline.	
HS Implementation Schedule (Wks):	0	Basis: Testing is within the current baseline.	
Other Handling Strategies:			
Statement of Residual Risk: Some startup issues may still arise			
Residual Likelihood:	Likely	Basis: ESTD testing will reduce the likelihood of discovering issues during startup	
Residual Consequence:	Significant	Basis: Minor startup issues require resolution, incurring cost and schedule impact	
Residual Risk Level:	Moderate	Residual Impact Basis: Worst Case: Startup issues require resolution, incurring cost and schedule impact	
Residual Cost Impact (\$K):	<u>Best Case</u> 150	<u>Most Likely</u> 200	<u>Worst Case</u> 250
Residual Schedule Impact (Mos):	2 Wks	4 Wks	8 Wks
Most Likely Case: Minor startup issues require resolution, incurring cost and schedule impact Best Case: Minor startup issues require resolution, incurring cost and schedule impact			
Impacted Scope of Work:			
Evaluation Comments:			
Event Comments:			

Risk / Opportunity Assessment Form				
ID Number: 069		Revision: 00		Last Date Evaluated: 24-Oct-06
Status: Active				
Event Title: Facility Services Design Complexity				
Type: Risk			Category:	
Assess. Element: 2.1		Title: Utilities Systems Tie-ins		
Responsible Org: -			Contact: DS - Sergio Mazul	Date Identified: 24-Oct-06
Statement of Event: The design of tie-ins to facility services is assumed to be straightforward. Designs for service tie-ins encounter issues which make the implementation of a successful design more complex than previously assumed.				
Likelihood:	Unlikely	Basis: The design of tie-ins to facility services is usually straightforward.		
Consequence / Benefit:	Significant	Basis: Delays in the project schedule, additional costs, and ineffective use of resources.		
Most Significant Cost Impact (\$k): 250			Most Significant Schedule Impact (Wks): 2 Mths	
Level:	Moderate	Event Trigger:		
Handling Strategy:	Reduce/Mitigate	Description: Specify and/or coordinate the tie-in point in the specification or during the review and approval of the Vendor design.		
Handling Strategy Action Items: 069-1 Specify and/or coordinate the tie-in point in the specification or during the review and approval of the Vendor design., , DS - Sergio Mazul,				
HS Implementation Cost (\$K):	0	Basis: Can be accomodated without any additional cost.		
HS Implementation Schedule (Wks):	0	Basis: Will be part of vendor design review and approval process.		
Other Handling Strategies:				
Statement of Residual Risk: Some minor problems may still be encountered				
Residual Likelihood:	Very Unlikely	Basis: Likelihood has been reduced by specifying tie-in points and reviewing vendor designs for correct tie-ins.		
Residual Consequence:	Negligible	Basis: Minor rework required. Cost and schedule delay		
Residual Risk Level:	Low	Residual Impact Basis: Worst Case: Some rework required. Cost and schedule delay		
Residual Cost Impact (\$K):	<u>Best Case</u> 25	<u>Most Likely</u> 50	<u>Worst Case</u> 100	Most Likely Case: Minor rework required. Cost and schedule delay Best Case: Minor rework required. Cost but no schedule delay
Residual Schedule Impact (Mos):	0	1 Wk	2 Wks	
Impacted Scope of Work:				
Evaluation Comments:				
Event Comments:				

Risk / Opportunity Assessment Form				
ID Number: 070		Revision: 00		Last Date Evaluated: 24-Oct-06
Status: Active				
Event Title: Persistent Contamination Control Issues				
Type: Risk			Category:	
Assess. Element: 3.0		Title: General		
Responsible Org: -			Contact: Mike Broome	Date Identified: 24-Oct-06
Statement of Event: It is assumed that the design of the Tank 48 FBSR will limit contamination control issues. The FBSR process is found to have aspects of the design and operational strategy which may create persistent contamination control problems.				
Likelihood:	Likely	Basis: This is a new process at SRS and has operation differences to established facilities currently in operation.		
Consequence / Benefit:	Critical	Basis: During operations a rising level of contamination occurs. Decontamination costs, loss of production and modification to correct problem before process is allowed to restart. (Assume 100k for cleanup, 100k for modification and 3 mths delay)		
Most Significant Cost Impact (\$k): 200K			Most Significant Schedule Impact (Wks): 3 mths	
Level:	High	Event Trigger:		
Handling Strategy:	Reduce/ Mitigate	Description: Design equipment and facility for ease of decontamination. During cold runs use a simulant capable of uncovering potential contamination pathways.		
Handling Strategy Action Items:				
070-1 Design equipment and facility for ease of decontamination, , , DS - Sergio Mazul,				
070-2 During cold runs investigate potential contamination pathways., , , DA - Mike Augeri,				
HS Implementation Cost (\$K):	0	Basis: 0		
HS Implementation Schedule (Wks):	0	Basis: 0		
Other Handling Strategies:				
Statement of Residual Risk: Contamination may still occur, but to a lesser degree.				
Residual Likelihood:	Unlikely	Basis: Cold run testing should have identified major potential contamination pathways.		
Residual Consequence:	Marginal	Basis: Persistent contamination control issue occurs which requires operations to be halted while decontamination and corrective action is taken.		
Residual Risk Level:	Low	Residual Impact Basis: Worst Case: Persistent contamination control issues occur, require corrective action, possible minor design modification and impact production.		
Residual Cost Impact (\$K):	<u>Best Case</u> 0	<u>Most Likely</u> 10	<u>Worst Case</u> 50	Most Likely Case: Persistent contamination control issues occur, require corrective action and impact production.
Residual Schedule Impact (Mos):	0	1 Wk	2 Wks	Best Case: Persistent contamination control issues occur, but are minor and do not impact production.
Impacted Scope of Work:				
Evaluation Comments:				
Event Comments:				

Risk / Opportunity Assessment Form						
ID Number: 071		Revision: 00		Last Date Evaluated: 24-Oct-06		
				Status: Active		
Event Title: Unacceptable Ventilation Impact						
Type: Risk			Category:			
Assess. Element: 2.2.2		Title: HVAC				
Responsible Org: -			Contact: DS - Sergio Mazul	Date Identified: 24-Oct-06		
Statement of Event: The current design assumes that the existing HVAC system will be adequate to accommodate FBSR ventilation and off-gas tie-ins. Upon evaluation of the FBSR off-gas and ventilation parameters, the existing HVAC equipment requires upgrading. Cost and schedule impact.						
Likelihood:	Unlikely	Basis: A preliminary evaluation was performed based on preliminary data from the FBSR Vendor and determined that the existing HVAC system is adequate.				
Consequence / Benefit:	Critical	Basis: Existing HVAC equipment would require upgrading. Cost and schedule impact.				
Most Significant Cost Impact (\$K): 500			Most Significant Schedule Impact (Wks): 3 Mths			
Level:	Moderate	Event Trigger:				
Handling Strategy:	Mitigate	Description: During preliminary design obtain HVAC requirements for the FBSR skid and confirm that the existing system is adequate or identify what modifications are required.				
Handling Strategy Action Items:						
071-1 During preliminary design obtain HVAC requirements for the FBSR skid and confirm that the existing system is adequate or identify what modifications are required, , DS - Sergio Mazul,						
HS Implementation Cost (\$K):	0	Basis: Cost for this review is already in baseline				
HS Implementation Schedule (Wks):	0	Basis: The review will be scheduled early during the preliminary design				
Other Handling Strategies:						
Statement of Residual Risk: Modifications could still be required but they would be identified early and not impact the schedule.						
Residual Likelihood:	Unlikely	Basis: Likelihood not reduced				
Residual Consequence:	Marginal	Basis: Minor modifications are required, but no schedule impact				
Residual Risk Level:	Low	Residual Impact Basis: Worst Case: Modifications are required, but no schedule impact Most Likely Case: Minor modifications are required, but no schedule impact Best Case: Vendor can accommodate impact in skid design				
Residual Cost Impact (\$K):	<u>Best Case</u> 0				<u>Most Likely</u> 250	<u>Worst Case</u> 500
Residual Schedule Impact (Mos):	0				0	0
Impacted Scope of Work:						
Evaluation Comments:						
Event Comments:						

Risk / Opportunity Assessment Form				
ID Number: 072		Revision: 00		Last Date Evaluated: 24-Oct-06
Status: Active				
Event Title: Module Handling and Installation				
Type: Risk			Category:	
Assess. Element: 2.0		Title: Project		
Responsible Org: -			Contact: Mary Pallon	Date Identified: 24-Oct-06
Statement of Event: The FBSR process equipment will be provided from the vendor in large modules which are assumed to be capable of being installed using standard SRS lifting equipment and without building modification. These modules require specialized lifting equipment and additional building modifications to allow their lifting and positioning inside Building 241-96H.				
Likelihood:	Very Unlikely	Basis: Based on conceptual data.		
Consequence / Benefit:	Marginal	Basis: Delays while specialized rigging equipment is fabricated and cost of fabrication and any additional building modifications.		
Most Significant Cost Impact (\$k): 100			Most Significant Schedule Impact (Wks): 2 Wks	
Level:	Low	Event Trigger:		
Handling Strategy:	Avoid	Description: Ensure requirements are placed in procurement specification for all handling equipment to be provided by the vendor. Review vendor design and lifting procedures.		
Handling Strategy Action Items:				
072-1 Specify in the procurement specification that all handling equipment is to be provided by the vendor. , , DS - Sergio Mazul,				
072-2 Review vendor lifting procedures, , , Con - Mary Pallon,				
072-3 Review vendor design, , , DA - Mike Augeri,				
HS Implementation Cost (\$K):	0	Basis: Will be included in subcontractor estimate		
HS Implementation Schedule (Wks):	0	Basis: Will be included in subcontractor schedule		
Other Handling Strategies:				
Statement of Residual Risk: Risk has been avoided				
Residual Likelihood:		Basis:		
Residual Consequence:		Basis:		
Residual Risk Level:			Residual Impact Basis:	
Residual Cost Impact (\$K):	<u>Best Case</u> 0	<u>Most Likely</u> 0	<u>Worst Case</u> 0	
Residual Schedule Impact (Mos):	0	0	0	
Impacted Scope of Work:				
Evaluation Comments:				
Event Comments:				

Risk / Opportunity Assessment Form				
ID Number: 073		Revision: 00		Last Date Evaluated: 24-Oct-06
Status: Active				
Event Title: Secondary Containment Required For Off-Gas Line				
Type: Risk			Category:	
Assess. Element: 1.2.4		Title: OFF-Gas		
Responsible Org: -			Contact: DA - Mike Augeri	Date Identified: 24-Oct-06
Statement of Event: The current design assumes that the off-gas can be routed through the interior of the building to connect with the existing HVAC System. The configuration of the off-gas line requires that it must exit the building to allow a tie-in and will require a secondary confinement to be constructed for that section of line.				
Likelihood:	Very Unlikely	Basis: The off-gas line will be routed through blockouts made in the existing wall. These blockouts would have to have significant interferences which cannot be re-engineered to maintain wall structural integrity.		
Consequence / Benefit:	Critical	Basis: Would require require a redesign of off gas system piping and result in lost project time.		
Most Significant Cost Impact (\$k): 200			Most Significant Schedule Impact (Wks): 8 Wks	
Level:	Moderate	Event Trigger:		
Handling Strategy:	Mitigate	Description: Develop parallel options for the off-gas sytem tie in such as including the filter assemblies within the Hold Tank Room or establishing a deviation from site codes and standards to allow routing of the line outside of the building.		
Handling Strategy Action Items:				
073-1 Obtain site standard deviation to allow routing the off-gas line outside of building, , , DA - Mike Augeri,				
073-2 Co-ordinate development of a conceptual deaign of the HEPA assemblies inside the Hold Tank Room, , , DA - Mike Augeri,				
HS Implementation Cost (\$K):	20	Basis: One DA will oversee development of a confinement strategy and follow progress to approval by code committee. In addition the DA will co-ordinate the conceptual design of placing the HEPA assemblies in the Hold Tank Room.		
HS Implementation Schedule (Wks):	8 Wks	Basis: Estimate of review time by code committee.		
Other Handling Strategies:				
Statement of Residual Risk: The risk still remains that the through-wall route may not work.				
Residual Likelihood:	Very Unlikely	Basis: Likelihood remains unchanged		
Residual Consequence:	Negligible	Basis: Through wall route cannot be performed and waiver is not allowed and HEPA assemblies cannot be installed within the HOLD Tank Room. An outside pipe with a secondary confinement will be required at additional cost and schedule delay.		
Residual Risk Level:	Low	Residual Impact Basis: Worst Case: Redesign of off gas system piping, cost and schedule impact		
Residual Cost Impact (\$K):	<u>Best Case</u> 0	<u>Most Likely</u> 0	<u>Worst Case</u> 200	Most Likely Case: Design is performed with the HEPA assembly inside the Hold Tank Room
Residual Schedule Impact (Mos):	0	0	8 Wks	Best Case: Design is performed with the HEPA assembly inside the Hold Tank Room
Impacted Scope of Work:				
Evaluation Comments:				
Event Comments:				

Risk / Opportunity Assessment Form					
ID Number: 074		Revision: 00			
		Last Date Evaluated: 24-Oct-06			
Status: Active					
Event Title: Heel Removal and Processing Does Not Meet Expectations					
Type: Risk		Category:			
Assess. Element: 1.0		Title: Processing			
Responsible Org: -		Contact: DA - Mike Augeri	Date Identified: 24-Oct-06		
Statement of Event: The end state of less than or equal to 12Kg of TPB in Tank 48 must be achieved to complete this project and return Tank 48 to service. The process cannot be performed as planned and the end state (return Tank 48 to service) cannot be achieved. A different strategy must be developed and used to achieve end state.					
Likelihood:	Likely	Basis: The ability to get the TPB to the transfer pump and out of the tank is unknown.			
Consequence / Benefit:	Crisis	Basis: If a different strategy of using a series of successive flushes is used it could more than double the processing time (2 year impact). Studies on TPB rheology, pump and mixing plans could also identify the need for additional equipment (spray nozzles, additional pumps etc). This could cost up to \$5M.			
Most Significant Cost Impact (\$k): 5,000		Most Significant Schedule Impact (Wks): 6 Mths			
Level:	High	Event Trigger:			
Handling Strategy:	Reduce/ Mitigate	Description: Revise operating strategy to process settled TPB to more effectively use existing supernate in Tank 48. Collect data with different slurry pump combinations and settling times to validate operating strategy.			
Handling Strategy Action Items: 074-1 Collect Data, , , DA - Mike Augeri, 074-2 Revise TR&C as indicated for improved instrumentation., , , DA - Mike Augeri, 074-3 Design and deploy identified equipment., , , DS - Sergio Mazul,					
HS Implementation Cost (\$K):	1,020	Basis: Data collection (OPEX), TR&C revision (\$20K) & new equipment (\$1M)			
HS Implementation Schedule (Wks):	5.5 Mths	Basis: New equipment installation (5.5 Mths)			
Other Handling Strategies:					
Statement of Residual Risk: Actual operation may not meet plans and Tank 48 return to service is delayed.					
Residual Likelihood:	Unlikely	Basis: Revised operating strategy reduces the likelihood of being unable to attain end state.			
Residual Consequence:	Crisis	Basis: Revised operating strategy helps reduce the additional processing duration but some delay is still realized.			
Residual Risk Level:	High	Residual Impact Basis: Worst Case: Revised operating strategy helps reduce the additional processing duration but a delay is still realized. Most Likely Case: Revised operating strategy helps reduce the additional processing duration but some delay is still realized. Best Case: Revised operating strategy helps reduce the additional processing duration and minimal delay is realized.			
Residual Cost Impact (\$K):	<u>Best Case</u> 0			<u>Most Likely</u> 0	<u>Worst Case</u> 0
Residual Schedule Impact (Mos):	3 Mths			6 Mths	1 Yr
Impacted Scope of Work:					
Evaluation Comments:					
Event Comments: Reference LWO-EVP-2006-00010, ITR Review of Path Forward for SRS Tank 48, Recommendations 5-1 and 5-7.					

Risk / Opportunity Assessment Form				
ID Number: 075		Revision: 01		Last Date Evaluated: 16-Jun-08
Status: Active				
Event Title: Design/ Operational Life Is Inadequate (Operational Vulnerability)				
Type: Risk			Category:	
Assess. Element: 1.0		Title: Processing		
Responsible Org: -			Contact: DA - Mike Augeri	Date Identified: 1-Nov-06
Statement of Event: Currently a design life of 5 years has been selected based on an operational life of 2 years. The process is required to operate for longer than assumed. Major equipment (DMR, CRR Filter, pumps etc.) will begin to fail and require replacement.				
Likelihood:	Likely	Basis: Perturbations in processing schedules, emergent conflicts in operational priorities etc., could extend the processing period past the life of the facility.		
Consequence / Benefit:	Crisis	Basis: Worst case would be a major vessel failure e.g. DMR, resulting in a shutdown for DMR removal, procurement, replacement, testing and restart. This would not impact the project, however is an operational vulnerability.		
Most Significant Cost Impact (\$k): 500			Most Significant Schedule Impact (Wks): > 1 Yr	
Level:	High	Event Trigger:		
Handling Strategy:	Reduce	Description: Develop procurement specification to ensure a robust design of major equipment. During startup testing, focus on identification of adverse indications that may reduce life expectancy and correct whenever feasible.		
Handling Strategy Action Items:				
075-1 Develop procurement specification to ensure a robust design of major equipment., , DA - Mike Augeri,				
075-3 During startup testing, focus on identification of adverse indications that may reduce life expectancy and correct whenever feasible., , DA - Mike Augeri,				
HS Implementation Cost (\$K):	0	Basis: This activity can be accommodated within the current baseline.		
HS Implementation Schedule (Wks):	0	Basis: The SAT and Startup are already scheduled. These additional activities will not alter their duration.		
Other Handling Strategies:				
Statement of Residual Risk: Even with a robust design and minimization of adverse operational impacts to the system, a major failure could still occur.				
Residual Likelihood:		Basis: Likelihood of failure has been reduced through system impact optimization and robust design.		
Residual Consequence:		Basis: This is an operational vulnerability and is not included in the Project T&PRA or schedule contingency.		
Residual Risk Level:			Residual Impact Basis: Worst Case: Major vessel failure, procurement and restart.	
Residual Cost Impact (\$K):	<u>Best Case</u> 0	<u>Most Likely</u> 0	<u>Worst Case</u> 0	Most Likely: Equipment fails and can be repaired. Best Case: Component failure occurs with spares on hand.
Residual Schedule Impact (Mos):	1 WK	1 Mth	1 Year	
Impacted Scope of Work:				
Evaluation Comments:				
Event Comments: Deleted action item 2 as this is no longer being performed.				

Risk / Opportunity Assessment Form

ID Number: 076 **Revision:** 02 **Last Date Evaluated:** 16-Jun-08 **Status:** Active

Event Title: Aggressive Post Installation Testing Schedule

Type: Risk **Category:**

Assess. Element: 3.0 **Title:** General

Responsible Org: - **Contact:** DA - Mike Augeri **Date Identified:** 8-Nov-06

Statement of Event: Project assumes that an aggressive post installation testing period is sufficient. This assumption is later proven incorrect as post installation testing is not able to be completed in accordance with this schedule.

Likelihood: Likely **Basis:** This is a new process at SRS and is likely to encounter problems during post installation testing.

Consequence / Benefit: Significant **Basis:** 1 month delay and additional cost to perform retesting and minor rework/procedure revisions.

Most Significant Cost Impact (\$k): 100 **Most Significant Schedule Impact (Wks):** 1 Mth

Level: Moderate **Event Trigger:**

Handling Strategy: Reduce/Mitigate **Description:** Although PS SSCs require a commensurate level of QA, include additional QA inspection in critical installation periods to ensure correct installation and eliminate rework. Perform additional criteria review and validation steps to assure that rework during testing is minimized.

Handling Strategy Action Items:

- 076-10 Assure SOW Testing Plans and Procedures are reviewed and stasured 1 or 5., , DA - Mike Augeri,
- 076-11 Witness testing and assure component testing is performed in accordance with approved test plans and procedures., , DA - Mike Augeri,
- 076-12 Assure vendor oversight and inspection is available during site installation., , To Be Assigned,
- 076-2 Witness vendor validation and ensure that lessons learned are documented., , DA - Mike Augeri,
- 076-3 Assure that the validation test lessons learned are incorporated into the FBSR design., , DA - Satish Shah,
- 076-4 Review and approve vendors QA manual., , QA - Bruce Dragon,
- 076-5 Assure SOW Engineering Documents are reviewed and stasured 1 or 5., , DS - Sergio Mazul,
- 076-6 Assure specifications and data sheets for FBSR equipment are reviewed and stasured 1 or 5., , DS - Sergio Mazul,
- 076-7 Assure all inspection and examination procedures are reviewed and stasured 1 or 5., , DS - Sergio Mazul,
- 076-9 Assure startup procedures are reviewed and stasured 1 or 5., , To Be Assigned,

HS Implementation Cost (\$K): 20 **Basis:** Cost of additional QA resources

HS Implementation Schedule (Wks): 1 Mth **Basis:** Duration additional additional QA is required.

Other Handling Strategies:

Statement of Residual Risk: Even with inspection and verification, other elements may contribute to hamper installation testing.

Residual Likelihood: Unlikely **Basis:** The likelihood is reduced and potential wiring and instrumentation problems have been eliminated.

Residual Consequence: Marginal **Basis:** Minor rework is required

Residual Risk Level:	Low			Residual Impact Basis: Worst Case: Some rework is required Most Likely Case: Minor rework is required Best Case: minimal rework is required, however it does not impact the schedule
Residual Cost Impact (\$K):	<u>Best Case</u> 10	<u>Most Likely</u> 25	<u>Worst Case</u> 50	
Residual Schedule Impact (Mos):	0	1 Wk	2 Wks	

Impacted Scope of Work:

Evaluation Comments:

Risk / Opportunity Assessment Form

ID Number: 076

Revision: 02

Last Date Evaluated: 16-Jun-08

Status: Active

Event Comments:

Risk / Opportunity Assessment Form				
ID Number: 077		Revision: 00		Last Date Evaluated: 9-Nov-06
Status: Active				
Event Title: Positive Pressure Within Process Requires Additional Confinement Requirements				
Type: Risk			Category:	
Assess. Element: 1.0		Title: Processing		
Responsible Org: -			Contact: DA - Mike Augeri	Date Identified: 9-Nov-06
Statement of Event: Currently it is assumed that a waiver will be granted (or not required) for the qualification of DMR and CRR as primary confinement. Due to the positive pressure of the process, the waiver is not obtained and additional modifications are required to qualify the primary and secondary confinements.				
Likelihood:	Very Unlikely	Basis: Based on the low pressures involved and the design assumption that process piping rather than process ducting will be used for the primary confinement.		
Consequence / Benefit:	Significant	Basis: Perform additional confinement design.		
Most Significant Cost Impact (\$k): 100			Most Significant Schedule Impact (Wks): 1 Mth	
Level:	Low	Event Trigger:		
Handling Strategy:	Mitigate	Description: Start waiver process early to avoid schedule impact and reduce cost of modification by performing during initial design phase.		
Handling Strategy Action Items: 077-1 Issue Confinement Strategy document for the Project., , DA - Mike Augeri,				
HS Implementation Cost (\$K):	0	Basis: No additional cost		
HS Implementation Schedule (Wks):	6 Wks	Basis: Time to get waiver determination		
Other Handling Strategies:				
Statement of Residual Risk: Waiver is not obtained and design must accommodate additional confinement features				
Residual Likelihood:	Very Unlikely	Basis: Likelihood has not changed		
Residual Consequence:	Negligible	Basis: Design is able to add confinement features without any additional cost or schedule impact.		
Residual Risk Level:	Low	Residual Impact Basis: Worst Case: Design will require changes at a late stage.		
Residual Cost Impact (\$K):	<u>Best Case</u> 0	<u>Most Likely</u> 0	<u>Worst Case</u> 50	Most Likely Case: Design is able to add confinement features without any additional cost or schedule impact.
Residual Schedule Impact (Mos):	0	0	2 Wks	Best Case: Design is able to add confinement features without any additional cost or schedule impact.
Impacted Scope of Work:				
Evaluation Comments:				
Event Comments:				

Risk / Opportunity Assessment Form						
ID Number: 078		Revision: 00		Last Date Evaluated: 15-Nov-06		
Status: Active						
Event Title: Scope reductions and conceptual phase CD-1 package assumptions do not materialize						
Type: Risk			Category:			
Assess. Element: 3.0		Title: General				
Responsible Org: -			Contact: PM - Jon Lunn	Date Identified: 15-Nov-06		
Statement of Event: Scope reductions were identified during conceptual design to account for a project with a 2 year operational life. High BDER scope deletions included removal of the steam supply skid, waste and supply tanks, reductant mechanical feed system, spare equipment, VFDs, and hard pipe waste transfer lines to develop the Low BDER. Some assumptions transferred work load to LW Operations e.g. monitoring hose-in-hose transfer line low points and Operator support to manually add reductant. If these assumptions are found to be invalid, this would result in increased project scope later and schedule impacts during execution of design and construction.						
Likelihood:	Very Likely	Basis: Some assumptions may be invalid as definition and detail is developed during design.				
Consequence / Benefit:	Critical	Basis: Schedule delay and cost impact.				
Most Significant Cost Impact (\$k): 3,000			Most Significant Schedule Impact (Wks): 3 Mths			
Level:	High	Event Trigger: Design input development and design output review.				
Handling Strategy:	Mitigate	Description: List all key assumptions. Further develop assumptions during preliminary design with Operations involvement. Keep Senior Management engaged in cost savings measures to assure support and influence to address organizational impacts and project cost control.				
Handling Strategy Action Items:						
078-1 Develop and maintain a list all key Conceptual estimate assumptions. , , DS - Sergio Mazul,						
078-2 Develop the strategy and plan, including scheduled activities to address and assure key assumptions are correct. , , PM - Jon Lunn,						
078-3 Communicate key assumptions up-front to LWO organizations involved or impacted, , , PO - Charles Lampley,						
078-4 Assure senior management concurrence and support for key scope reduction assumptions that impact, , , PO - Charles Lampley,						
HS Implementation Cost (\$K):	0	Basis: Cost will be within the Project baseline for PM activities.				
HS Implementation Schedule (Wks):	0	Basis: This activity will be performed for the entire length of the Project.				
Other Handling Strategies:						
Statement of Residual Risk: Handling strategies result is higher focus by the team and management to support controlling scope growth. Residual risk remains.						
Residual Likelihood:	Very Likely	Basis: Will most likely occur during the life of the project.				
Residual Consequence:	Significant	Basis: Several of the scope deleted individually could individually exceed several hundred thousand dollars. It is not unlikely that invalid scope deletion assumptions could result in project scope up to \$1.5M.				
Residual Risk Level:	High	Residual Impact Basis: Worst Case: Schedule delay and additional cost Most Likely Case: Schedule delay and additional cost Best Case: Schedule delay and additional cost				
Residual Cost Impact (\$K):	<u>Best Case</u> 800				<u>Most Likely</u> 1,500	<u>Worst Case</u> 2,000
Residual Schedule Impact (Mos):	4 Wks				8 Wks	10 Wks
Impacted Scope of Work: LWO systems that interface with the FBSR system (transfer lines, support systems, etc....)						
Evaluation Comments:						
Event Comments:						

Risk / Opportunity Assessment Form				
ID Number: 079		Revision: 00		Last Date Evaluated: 15-Nov-06
Status: Active				
Event Title: Adequacy of Existing Foundations for the FBSR Skid				
Type: Risk			Category:	
Assess. Element: 2.2.1		Title: Building 241-96H Structure		
Responsible Org: -			Contact: DS - Sergio Mazul	Date Identified: 15-Nov-06
Statement of Event: The FBSR Skid is being designed to use the existing foundations within the 96H Structure. The loads from the skid have not been evaluated to determine if the existing foundation is adequate or if addition foundation mod's would be required. After evaluation it is found that the foundation is inadequate				
Likelihood:	Unlikely	Basis: It is believed that SM will be able to make it work but it may take time to evaluate.		
Consequence / Benefit:	Critical	Basis: There will be a large amount of Construction work to modify the existing foundations		
Most Significant Cost Impact (\$k): 750			Most Significant Schedule Impact (Wks): 3 Mths	
Level:	Moderate	Event Trigger:		
Handling Strategy:	Mitigate	Description: Perform the required analysis early in preliminary design.		
Handling Strategy Action Items:				
079-1 Perform the required analysis early in preliminary design., , DS - Sergio Mazul,				
079-2 Provide the FBSR Vendor with building loading limitations to ensure their design impacts to the foundations are minimal (Specification), , , DS - Sergio Mazul,				
HS Implementation Cost (\$K):	0	Basis: Cost will be within the Project baseline		
HS Implementation Schedule (Wks):	0	Basis: This activity will be performed within Project baseline.		
Other Handling Strategies:				
Statement of Residual Risk: Additional foundation mod's may still be required.				
Residual Likelihood:	Unlikely	Basis: Likelihood has not been reduced.		
Residual Consequence:	Significant	Basis: Cost of additional modifications and schedule delay		
Residual Risk Level:	Moderate	Residual Impact Basis: Worst Case: Cost of additional modifications and schedule delay		
Residual Cost Impact (\$K):	<u>Best Case</u> 200	<u>Most Likely</u> 500	<u>Worst Case</u> 750	Most Likely Case: Cost of additional modifications and schedule delay Best Case: Cost of additional modifications however, no schedule delay
Residual Schedule Impact (Mos):	0	1 Mth	2 Mths	
Impacted Scope of Work:				
Evaluation Comments:				
Event Comments:				

Risk / Opportunity Assessment Form				
ID Number: 080		Revision: 00		Last Date Evaluated: 16-Nov-06
Status: Active				
Event Title: Unable To Determine Permissible Residual TPB Limit Has Been Met				
Type: Risk			Category:	
Assess. Element: 3.0		Title: General		
Responsible Org: -			Contact: PO - Charles Lampley	Date Identified: 16-Nov-06
Statement of Event: Currently a limit of 12 Kg residual TPB is the criterion for allowing Tank 48 to be returned to service. This amount of TPB may not be determined in such a large tank by sampling. Another method may need to be developed prior to allowing Tank 48 to be returned to service.				
Likelihood:	Unlikely	Basis: TPB can adhere to Tank walls, internal components and be non-uniformly distributed in residual heel making it possible that a reliable measurement of its residual quantity within Tank 48 cannot be made.		
Consequence / Benefit:	Critical	Basis: Delay is realized while alternate method of verification is established and additional cost of development and implementation.		
Most Significant Cost Impact (\$k): 100			Most Significant Schedule Impact (Wks): 3 Months	
Level:	Moderate	Event Trigger:		
Handling Strategy:	Avoid	Description: Develop a more practical criterion for determination of residual TPB level based on measuring the TPB in Salt solution flush effluents, prediction of residual TPB transportation to downstream facilities and potential impacts to those facilities e.g. flammability concerns etc. Implement this verification method during Tank 48 heel processing.		
Handling Strategy Action Items:				
080-1 Develop criterion for determination of residual TPB level based on measuring the TPB in Salt solution flush effluents, prediction of residual TPB transportation to downstream facilities and potential impacts to those facilities e.g. flammability concerns etc. , , SRNL - Richard Edwards,				
080-2 Implement this verification method during Tank 48 heel processing., , LWFO - Wyatt Clark,				
HS Implementation Cost (\$K):	100	Basis: Cost of developing methodology and implementation of sampling and analysis during heel flushing.		
HS Implementation Schedule (Wks):	0	Basis: Development and implementation will be performed in parallel with project design and execution of heel removal.		
Other Handling Strategies:				
Statement of Residual Risk: This risk will be successfully avoided. No residual risk.				
Residual Likelihood:		Basis:		
Residual Consequence:		Basis:		
Residual Risk Level:		Residual Impact Basis:		
Residual Cost Impact (\$K):	<u>Best Case</u> 0	<u>Most Likely</u> 0	<u>Worst Case</u> 0	
Residual Schedule Impact (Mos):	0	0	0	
Impacted Scope of Work:				
Evaluation Comments:				
Event Comments: Reference LWO-EVP-2006-00010, ITR Review of Path Forward for SRS Tank 48, Recommendation 5-3.				

Risk / Opportunity Assessment Form						
ID Number: 082		Revision: 00		Last Date Evaluated: 22-Jan-07		
Status: Active						
Event Title: Organic Carries Over to Product Mix Tank						
Type: Risk			Category:			
Assess. Element: 1.0		Title: Processing				
Responsible Org: -			Contact: DA - Mike Augeri	Date Identified: 22-Jan-07		
Statement of Event: During normal operating conditions, organics will be destroyed by steam reforming to within acceptable limits for transfer of Product Mix Tank contents to Tank Farm receipt tank. If it is possible that during off-normal operating conditions a portion of organics is not destroyed and could be transferred back to the Tank Farm, this event would have to be prevented.						
Likelihood:	Unlikely	Basis: It is unlikely that this will occur as the FBSR includes process controls for temperature and upset conditions to ensure the feed is treated.				
Consequence / Benefit:	Critical	Basis: If it is possible that during off-normal operating conditions a portion of organics is not destroyed and could be transferred back to the Tank Farm, additional scope, possibly including Safety Class controls, would be added to the project.				
Most Significant Cost Impact (\$k): 250			Most Significant Schedule Impact (Wks): 2 Mths			
Level:	Moderate	Event Trigger:				
Handling Strategy:	Reduce/ Mitigate	Description: Provide a design constraint to the vendor at initial design for preventing organics from entering the PMT. Ensure the feature meets our needs during design review process.				
Handling Strategy Action Items:						
082-1 Modify TR&C to provide a design constraint to the vendor at initial design for preventing organics from entering the PMT, , , DA - Mike Augeri,						
082-2 Place design constraint for preventing organics from entering the PMT in vendor specification., , , DS - Sergio Mazul,						
082-3 Verify during Pilot-scale testing that products meet SOW and TR&C requirements., , , DA - Mike Augeri,						
082-4 Ensure this event is considered in CHA., , , DA - Mike Augeri,						
HS Implementation Cost (\$K):	10	Basis: Cost to revise TR&C.				
HS Implementation Schedule (Wks):	0	Basis: Specification in progress.				
Other Handling Strategies:						
Statement of Residual Risk: Proposed design is later found unacceptable.						
Residual Likelihood:	Unlikely	Basis: Independent design reviews and customer interactions during design development.				
Residual Consequence:	Significant	Basis: Cost to perform modifications to control systems.				
Residual Risk Level:	Moderate	Residual Impact Basis: Worst Case: Major physical modifications are required. Most Likely Case: Control system can be modified to avoid organics in the PMT. Best Case: Operational procedure changes can avoid the issue.				
Residual Cost Impact (\$K):	<u>Best Case</u> 20				<u>Most Likely</u> 100	<u>Worst Case</u> 250
Residual Schedule Impact (Mos):	0				0	0
Impacted Scope of Work:						
Evaluation Comments:						
Event Comments:						

Risk / Opportunity Assessment Form				
ID Number: 083		Revision: 00		Last Date Evaluated: 14-Feb-07
Status: Active				
Event Title: DWPF Processing Impacted by FBSR Product				
Type: Risk			Category:	
Assess. Element: 1.3		Title: Transfer Product to Receipt Tank		
Responsible Org: -			Contact: Satish Shah	Date Identified: 14-Feb-07
Statement of Event: The current baseline design is based on producing a product that can be slurried and sent to DWPF via the receipt tank. Pilot testing indicates that the product stream will contain carbon particles that are not acceptable in the feed to DWPF. FBSR Process cannot be deployed as planned and a new unit operation is required to remove the carbon.				
Likelihood:	Likely	Basis: Based on the Hazen pilot testing which showed carbon fines in the product stream from approximately 6-8 wt% (Vs DWPF WAC limit of 0.24%)		
Consequence / Benefit:	Crisis	Basis: A new unit operation will have to be designed and installed to handle the carbon fines. After installation of the new unit operation, the process will be restarted. Cost of design and installation of new unit operation.		
Most Significant Cost Impact (\$k): 500			Most Significant Schedule Impact (Wks): 6 Mths	
Level:	High	Event Trigger:		
Handling Strategy:	Mitigate	Description: Perform further evaluation of the process for reducing of carbon fines in the final product stream.		
Handling Strategy Action Items:				
083-1 Develop a database from ESTD validation Phase 3., , DA - Satish Shah,				
083-2 Evaluate process for FBSR output in the final product stream., , DA - Satish Shah,				
083-3 Develop modeling for sludge batch with FBSR output., , DA - Satish Shah,				
HS Implementation Cost (\$K):	0	Basis: No additional cost to project baseline.		
HS Implementation Schedule (Wks):	0	Basis: Perform as part of the already scheduled preliminary design.		
Other Handling Strategies:				
Statement of Residual Risk: Carbon can still create a processing problem at DWPF, however evaluations already completed reduce the schedule impact if modifications are necessary.				
Residual Likelihood:	Likely	Basis: The likelihood of this event has not been reduced.		
Residual Consequence:	Significant	Basis: Design modifications will be required		
Residual Risk Level:	Moderate	Residual Impact Basis: Worst Case: Design modifications will be required Most Likely Case: Design modifications will be required		
Residual Cost Impact (\$K):	<u>Best Case</u> 0	<u>Most Likely</u> 500	<u>Worst Case</u> 500	Best Case: DWPF WAC carbon criteria is met once FBSR product is blended with Sludge Batch
Residual Schedule Impact (Mos):	0	2 Mths	4 Mths	
Impacted Scope of Work:				
Evaluation Comments:				
Event Comments:				

Risk / Opportunity Assessment Form				
ID Number: 085		Revision: 00		Last Date Evaluated: 28-Feb-07
				Status: Active
Event Title: Maintenance Requires Remote Operations				
Type: Risk Internal Technical			Category:	
Assess. Element: 3.0		Title: General		
Responsible Org: -			Contact: DS - Sergio Mazul	Date Identified: 28-Feb-07
Statement of Event: The current design is based on a maintenance strategy that does not require remote operation provisions to maintain distance and shielding. System draining and flushing have been assumed adequate for decontamination prior to maintenance. It is determined that lowering of radiation rates to a suitable level for maintenance cannot be achieved by draining and flushing.				
Likelihood:	Likely	Basis: All items requiring maintenance have not been identified at this time.		
Consequence / Benefit:	Crisis	Basis: Schedule delay and cost to design and install features that provide for remote maintenance.		
Most Significant Cost Impact (\$k): 2,000			Most Significant Schedule Impact (Wks): 6 Mths	
Level:	High	Event Trigger: FBSR system design and maintainability requirements definition phase, MSA/ORR, Hot Operations.		
Handling Strategy:	Mitigate	Description: During design, assure all items requiring maintenance are designed and located for easy access, removal and replacement to reduce maintenance time. Where possible provide shielding portals for access and rigging/hoisting points that take advantage of available distance and shielding. Determine if any equipment bails, hoist attachments, or camera views would be beneficial for some equipment maintenance activities.		
Handling Strategy Action Items:				
085-1 Identify Radiological Requirements in the FBSR SOW., , DS - Sergio Mazul,				
085-2 Require the FBSR vendor to identify components requiring maintenance., , DS - Sergio Mazul,				
085-3 Require FBSR vendor to provide maintenance strategy and procedure documentation., , DS - Sergio Mazul,				
085-4 Assure all items requiring maintenance are identified., , DS - Sergio Mazul,				
085-5 Assure that the FBSR system design provides for easy access, minimal shielding removal, shielding port provisions, equipment removal and the means for replacement., , DS - Sergio Mazul,				
085-6 Determine the maximum weight that can be handled by the existing monorail in the facility., , DS - Sergio Mazul,				
085-7 Require the FBSR vendor to input rad calcs., , DS - Sergio Mazul,				
085-8 Determine early in design what rad rates can be expected after draining, flushing and ventilation., , Rad Tech - Ken Flemming,				
HS Implementation Cost (\$K):	16	Basis: Additional \$16,000 will be provided to perform the monorail analysis study and the rad rate study (160 mhrs).		
HS Implementation Schedule (Wks):	0	Basis: This activity will be performed in parallel with vendor design activity and no project contingency or extension should be required.		
Other Handling Strategies:				
Statement of Residual Risk: Residual risk remains that remotability aspects will not be achieved without more control tools, vision, and overhead crane/hoist.				
Residual Likelihood:	Likely	Basis: Likelihood has been reduced slightly by implementation of action items.		
Residual Consequence:	Significant	Basis: Schedule delay and additional cost		
Residual Risk Level:	Moderate	Residual Impact Basis: Worst Case: Schedule delay and additional cost Most Likely Case: Schedule delay and additional cost Best Case: Schedule delay and additional cost		
Residual Cost Impact (\$K):	<u>Best Case</u> 300	<u>Most Likely</u> 600	<u>Worst Case</u> 1000	
Residual Schedule Impact (Mos):	1 Mth	2 Mths	3 Mths	

Risk / Opportunity Assessment Form

ID Number: 085

Revision: 00

Last Date Evaluated: 28-Feb-07

Status: Active

Impacted Scope of Work: FBSR system design/fab and 241-96H support systems needed for any remotability equipment operation.

Evaluation Comments:

Event Comments:

Risk / Opportunity Assessment Form						
ID Number: 086		Revision: 00		Last Date Evaluated: 26-Mar-07		
Status: Active						
Event Title: Depleted Uranium is Required to be Added Prior to Transfer to Tank Farm Receipt Tank						
Type: Risk			Category:			
Assess. Element: 1.3		Title: Transfer Product to Receipt Tank				
Responsible Org: -			Contact: DA - Satish Shah	Date Identified: 26-Mar-07		
Statement of Event: The current design is based on producing a product that can be slurried and sent to Tank 51. Tank 40 and Tank 43 were identified as alternative receipt tanks. The U235 enrichment of Tank 48 material exceeds the requirement for DWPF and the 2H Evaporator systems requiring the addition of depleted uranium. Process cannot be deployed as planned.						
Likelihood:	Likely	Basis: The U235 enrichment of Tank 48 material is likely to exceed the requirement for DWPF and the 2H Evaporator based on sample analysis to date.				
Consequence / Benefit:	Marginal	Basis: Additional materials cost incurred and potential for design change depending on deployment location (Tank 48 or FBSR product mix tank).				
Most Significant Cost Impact (\$k): 250			Most Significant Schedule Impact (Wks): 1 Mth			
Level:	Moderate	Event Trigger:				
Handling Strategy:	Mitigate	Description: Perform NCSE/NCSA and provide ability to add depleted uranium to Tank 48 or Product Mix Tank.				
Handling Strategy Action Items:						
086-1 Perform NCSE/NCSA, , DA - Andy Tisler,						
086-2 Require vendor to provide ability to add chemicals to FBSR product stream., , DA - Mike Augeri,						
HS Implementation Cost (\$K):	100	Basis: Additional cost to project baseline for additional design and fabrication.				
HS Implementation Schedule (Wks):	3 Mths	Basis: Perform in parallel with already scheduled preliminary design.				
Other Handling Strategies:						
Statement of Residual Risk: Addition of depleted uranium may be required to comply with enrichment requirements (based on NCSE/NCSA results)						
Residual Likelihood:	Likely	Basis: The U235 enrichment of Tank 48 material is likely to exceed the requirement for DWPF and the 2H Evaporator based on sample analysis to date.				
Residual Consequence:	Marginal	Basis: Additional cost of adding depleted uranium.				
Residual Risk Level:	Moderate	Residual Impact Basis: Worst, Most Likely and Best Cases: Additional cost of adding depleted uranium.				
Residual Cost Impact (\$K):	<u>Best Case</u> 150				<u>Most Likely</u> 150	<u>Worst Case</u> 150
Residual Schedule Impact (Mos):	0				0	0
Impacted Scope of Work:						
Evaluation Comments:						
Event Comments:						

Risk / Opportunity Assessment Form						
ID Number: 087		Revision: 00		Last Date Evaluated: 26-Mar-07		
Status: Active						
Event Title: High Silica Content Creates a Processing Problem at 2H Evaporator						
Type: Risk			Category:			
Assess. Element: 1.3		Title: Transfer Product to Receipt Tank				
Responsible Org: -			Contact: DA - Satish Shah	Date Identified: 26-Mar-07		
Statement of Event: Preliminary results from Hazen Pilot Scale testing identified the potential to have high soluble silica (>1300 g/L) in the Tank Farm receipt tank. This content is much higher than anything processed to date in the 2H evaporator system which could cause significant scale build up in the evaporator at a faster rate. Even if material is sent to DWPF there is concern that the recycle returned to the 2H systems will be significantly higher in soluble silica.						
Likelihood:	Likely	Basis: SRNL evaluation on solids from Hazen Pilot scale testing showed that soluble silica in water is ~ 230 mg/L which could be even higher in alkaline environment of waste tank.				
Consequence / Benefit:	Crisis	Basis: Silica content of FBSR product stream or resultant DWPF recycle from FBSR processing is too high to process through 2H evaporator system. A new unit operation will have to be designed and installed to reduce/remove the silica. After installation of the new unit operation, the process will be restarted. Cost of design and installation of new unit operation.				
Most Significant Cost Impact (\$k): 500			Most Significant Schedule Impact (Wks): 6 Mths			
Level:	High	Event Trigger:				
Handling Strategy:	Mitigate	Description: Perform testing to determine soluble silica expected in the Tank Farm receipt tank. Evaluate impact to 2H evaporator system and determine if additional action is required to reduce/remove silica.				
Handling Strategy Action Items:						
087-1 Perform testing to determine soluble silica expected in the Tank Farm receipt tank., , SRNL - Alan Barnes,						
087-2 Evaluate impact to 2H evaporator system and determine if additional action is required to reduce/remove silica., , LWO - Skip Wiggins,						
HS Implementation Cost (\$K):	50	Basis: Additional cost to project baseline for testing.				
HS Implementation Schedule (Wks):	2 Mths	Basis: Perform as part of the compatibility testing with downstream facilities.				
Other Handling Strategies:						
Statement of Residual Risk: Silica can still create a processing problem at 2H Evaporator System, however, schedule impact is reduced by realizing this risk early.						
Residual Likelihood:	Likely	Basis: The likelihood of the event has not been reduced.				
Residual Consequence:	Critical	Basis: Design modifications will be required.				
Residual Risk Level:	High	Residual Impact Basis: Worst Case: Design modifications will be required. Most Likely Case: Design modifications will be required. Best Case: Design modifications will be required.				
Residual Cost Impact (\$K):	<u>Best Case</u> 500				<u>Most Likely</u> 500	<u>Worst Case</u> 500
Residual Schedule Impact (Mos):	3 Mths				3 Mths	4 Mths
Impacted Scope of Work:						
Evaluation Comments:						
Event Comments:						

Risk / Opportunity Assessment Form						
ID Number: 089		Revision: 00		Last Date Evaluated: 16-Aug-07		
Status: Active						
Event Title: Technology Issues Make Deployment Impractical						
Type: Risk			Category:			
Assess. Element: 3.0		Title: General				
Responsible Org: -			Contact: DA - Mike Augeri	Date Identified: 16-Aug-07		
Statement of Event: Known technical issues require resolution and new technical issues may arise during the design, testing, safety analysis. These issues prove so difficult to overcome or resolutions so impractical to implement, that the technology cannot be successfully deployed.						
Likelihood:	Very Unlikely	Basis: Substantial testing has been performed to date, including pilot scale. The data from testing shows no reason to doubt this technology will not perform as required in the SRS application.				
Consequence / Benefit:	Crisis	Basis: The worst case would be that deployment would not be possible. At this point a BCP would be initiated to the Project to develop an alternative approach or a new project would be initiated. As this is outside the scope of the TTP Project any consequences will not be included in T&PRA cost. The worst case impact could result in up to a four year delay in the TTP Project while a backup technology is identified and matured.				
Most Significant Cost Impact (\$k): N/A			Most Significant Schedule Impact (Wks): 4 Yrs			
Level:	High	Event Trigger: Currently open / Close upon successfully reaching milestone of validating FBSR is adequately mature to deploy.				
Handling Strategy:	Mitigate	Description: Develop a backup technology (Wet Air Oxidation) in parallel to maturing the FBSR option. Add a milestone to the project schedule at an appropriate time in the development of FBSR to establish FBSR viability declaration.				
Handling Strategy Action Items: 089-1 Add a milestone to the TTP Project schedule to establish FBSR viability declaration., , PM - Jon Lunn, 089-2 Perform testing, design, modeling as required to mature the WAO backup option., , PO - Charles Lampley,						
HS Implementation Cost (\$K):	N/A	Basis: The cost of WAO development will be funded by others.				
HS Implementation Schedule (Wks):	N/A	Basis: Currently working through to critical decision date.				
Other Handling Strategies:						
Statement of Residual Risk: By increasing the maturity of the backup option, if this risk is realized the schedule impact to the TTP Project will be lessened.						
Residual Likelihood:	Very Unlikely	Basis: No change in likelihood.				
Residual Consequence:	Crisis	Basis: Schedule impact is reduced to 2 yrs. A BCP will be generated to perform a change to the baseline or a new project will be initiated.				
Residual Risk Level:	High	Residual Impact Basis: Worst Case, Most Likely and Best case: Even if WAO were developed in parallel, there would be a two year lag as currently it is not as technically mature as FBSR.				
Residual Cost Impact (\$K):	<u>Best Case</u> 0				<u>Most Likely</u> 0	<u>Worst Case</u> 0
Residual Schedule Impact (Mos):	2 yrs				2 yrs	2 Yrs
Impacted Scope of Work:						
Evaluation Comments:						
Event Comments: This risk is captured under PBS-SR-0014 Risk Management Plan (Risk 122)						

Risk / Opportunity Assessment Form					
ID Number: 090		Revision: 00		Last Date Evaluated: 26-Nov-07	
Status: Active					
Event Title: Interim Standard 1189 Guidance Differs from Approved Standard					
Type: Risk External Technical			Category:		
Assess. Element: 3.0		Title: General			
Responsible Org: -			Contact: DA - Mike Augeri	Date Identified: 26-Nov-07	
Statement of Event: Currently the TTP Project is utilizing an interim guidance document to implement the upcoming requirements of Standard 1189. A risk exists that when the Standard is approved, it contains additional or more stringent requirements than the guideline. Additional design and modification to the facility could be required.					
Likelihood:	Unlikely	Basis: Based on the interim guidance and the final Standard being both issued by DOE, it is unlikely there will be significant differences between them.			
Consequence / Benefit:	Crisis	Basis: Redesign and modification of the TTP Project could be up to \$12M and impact the project by 6 months.			
Most Significant Cost Impact (\$k): 12,000			Most Significant Schedule Impact (Wks): 6		
Level:	High	Event Trigger:			
Handling Strategy:	Mitigate	Description: Project management and Design Authority will work with DOE to identify any differences between Standard and Interim Guidance to allow earliest possible execution of design changes to minimize impact. If this risk is realized, a BCP will be generated. The CD-1 range estimate has been increased from (S96 - S138M) to (S100 - 150M) to allow additional contingency funds for this risk.			
Handling Strategy Action Items: 090-1 Maintain regular communication with DOE on the subject of STD 1189 implementation., , Mike Augeri,					
HS Implementation Cost (\$K):	0	Basis: Will be part of ongoing DA and Project Management activities.			
HS Implementation Schedule (Wks):	0	Basis: Will be part of ongoing DA and Project Management activities.			
Other Handling Strategies:					
Statement of Residual Risk: If this risk is realized, a BCP will be generated. The CD-1 range estimate has been increased from (S96 - S138M) to (S100 - 150M) to allow additional contingency funds for this risk.					
Residual Likelihood:		Basis:			
Residual Consequence:		Basis:			
Residual Risk Level:			Residual Impact Basis:		
Residual Cost Impact (\$K):	<u>Best Case</u>	<u>Most Likely</u>			<u>Worst Case</u>
Residual Schedule Impact (Mos):					
Impacted Scope of Work:					
Evaluation Comments:					
Event Comments: If this risk is realized, a BCP will be generated. The CD-1 range estimate has been increased from (S96 - S138M) to (S100 - 150M) to allow additional contingency funds for this risk.					

Risk / Opportunity Assessment Form						
ID Number: 092		Revision: 00		Last Date Evaluated: 7-Feb-08		
Status: Active						
Event Title: NESHAP Air Permit (Non-Rad) Exemption is not Possible						
Type: Risk Internal Programmatic			Category:			
Assess. Element: 3.0		Title: General				
Responsible Org: -			Contact: DA - Satish Shah	Date Identified: 7-Feb-08		
Statement of Event: Currently it is assumed that the NESHAP (non-Rad) construction Permit will be exempted for TTP deployment. A risk exists that when the calculated emissions are finalized, there is a threshold limitation that has been exceeded. The project will have to submit a construction permit application and CD-3 would not be completed and construction not begun until a permit is obtained.						
Likelihood:	Likely	Basis: Current information from Hazen (2006 Hazen testing) indicates the particulate matter (PM) threshold may be exceeded with a full-scale unit.				
Consequence / Benefit:	Critical	Basis: A delay to the project schedule will occur while the permit application is prepared by WSRC and subsequently reviewed and approved by SCDHEC. A worse case is estimated at 3 mths. An additional cost of 50K.				
Most Significant Cost Impact (\$k): 50			Most Significant Schedule Impact (Wks): 3 Mths			
Level:	High	Event Trigger:				
Handling Strategy:	Mitigate	Description: Develop data and perform calculation to determine emission levels of unit in sufficient time to allow a permit to be requested should the thresholds be exceeded.				
Handling Strategy Action Items:						
092-1 Include specific direction to vendor to develop data for air emissions calculation input in support of early permit exemption determination. (6 mths before CD-3 April 10 2010), , , DS - Sergio Mazul,						
092-2 Schedule air emission exemption calculation completion early in support of early permit exemption determination., , , HTF ENG-Caroline Atseff,						
HS Implementation Cost (\$K):	0	Basis: The cost for performing this evaluation is already in the baseline cost estimate.				
HS Implementation Schedule (Wks):	0	Basis: The schedule for performing this evaluation can be brought forward without impacting the overall schedule.				
Other Handling Strategies:						
Statement of Residual Risk: Air exemption may still be determined not acceptable and permit application is required, however, the schedule delay has been avoided by performing the determination early.						
Residual Likelihood:	Likely	Basis: Current information from Hazen (2006 Hazen testing) indicates the particulate matter (PM) threshold may be exceeded with a full-scale unit.				
Residual Consequence:	Negligible	Basis: Cost to develop and submit a NESHAP (non-Rad) construction permit.				
Residual Risk Level:	Low	Residual Impact Basis: All cases: no schedule impact, but additional cost of preparing and submitting a NESHAP construction permit request.				
Residual Cost Impact (\$K):	<u>Best Case</u> 50				<u>Most Likely</u> 50	<u>Worst Case</u> 50
Residual Schedule Impact (Mos):	0				0	0
Impacted Scope of Work:						
Evaluation Comments:						
Event Comments:						

Risk / Opportunity Assessment Form					
ID Number: 093		Revision: 00			
		Last Date Evaluated: 16-Jun-08			
Status: Active					
Event Title: Accident Analysis Determines Additional Safety Controls are Required					
Type: Risk Internal Technical		Category:			
Assess. Element: 1.0		Title: Processing			
Responsible Org: -		Contact: DA - Mike Augeri	Date Identified: 16-Jun-08		
Statement of Event: A preliminary CHAP was developed without using the two 241-96H tanks (previously ARP MST strike tanks) as part of the process. A risk exists that when updating the CHAP to include these tanks (and additional MAR) a need is identified to include additional safety controls in the design.					
Likelihood:	Very Likely	Basis: Preliminary scoping calculations and evaluations have indicated that the larger inventory may cause the seismic event dose consequences to exceed guidelines.			
Consequence / Benefit:	Crisis	Basis: The worst case would require seismically qualified ventilation and fire suppression. This would impact the cost of the project, however, as this risk would be realized in the early stages of the project, milestone date impact can be avoided.			
Most Significant Cost Impact (\$K): 28,000		Most Significant Schedule Impact (Wks): 0			
Level:	High	Event Trigger:			
Handling Strategy:	Accept	Description: Safety Class controls have been priced and included in the High BDER estimate, therefore if this risk is realized, the High BDER scope will be implemented via an appropriate change control mechanism. Upon DOE approval of the preliminary DSA, this risk can be closed.			
Handling Strategy Action Items:					
HS Implementation Cost (\$K):		Basis:			
HS Implementation Schedule (Wks):		Basis:			
Other Handling Strategies:					
Statement of Residual Risk:					
Residual Likelihood:		Basis:			
Residual Consequence:		Basis:			
Residual Risk Level:		Residual Impact Basis:			
Residual Cost Impact (\$K):	<u>Best Case</u>			<u>Most Likely</u>	<u>Worst Case</u>
Residual Schedule Impact (Mos):					
Impacted Scope of Work:					
Evaluation Comments:					
Event Comments:					

Risk / Opportunity Assessment Form				
ID Number: 094		Revision: 00		Last Date Evaluated: 16-Jun-08
Status: Active				
Event Title: Startup/Shutdown Creates Material for Which There is no Disposition path				
Type: Risk Internal Technical			Category:	
Assess. Element: 1.0		Title: Processing		
Responsible Org: -			Contact: DA - Satish Shah	Date Identified: 16-Jun-08
Statement of Event: Startup and shutdown of the FBSR process are assumed to be controlled in such a way as to result in product that is compatible with the FBSR handling system and conforming to the downstream processing criteria. A risk exists that an uncontrolled shutdown or transient condition produces a product form that cannot be handled by the existing system (e.g. solids cannot be moved) or will not meet the downstream processing criteria. Process operation cannot continue until an acceptable disposition path is found for the material.				
Likelihood:	Likely	Basis: As was the case during 2006 ESTD test runs, an un-controlled process shutdown (such as loss of power and instrument air) can lead to a partially processed / agglomerated product that may not meet the TF WAC and may require further handling and re-processing.		
Consequence / Benefit:	Critical	Basis: Loss of processing time to remove solid material and reroute into system or other disposition path.		
Most Significant Cost Impact (\$k): 250			Most Significant Schedule Impact (Wks): 3 Mths	
Level:	High	Event Trigger:		
Handling Strategy:	Mitigate	Description: Evaluate properties of partially processed DMR material and perform testing to determine/identify disposition path. Complete ESTD testing and roll lessons learned into control system design.		
Handling Strategy Action Items:				
094-1 Evaluate solubility of partially processed product., , SRNL - Alan Barnes,				
094-2 Determine handling properties of partially processed product (grind, sieve), , , DA - Mike Augeri,				
094-3 Evaluate disposal path of partially processed material including downstream impacts., , LWO - Skip Wiggins,				
094-4 Complete ESTD testing and roll lessons learned into control system design., , DS - Sergio Mazul,				
HS Implementation Cost (\$K):	100	Basis: Cost of evaluation, sampling & analysis by SRNL.		
HS Implementation Schedule (Wks):	6 Mths	Basis: Duration of evaluation, sampling, analysis and report.		
Other Handling Strategies:				
Statement of Residual Risk: Partially processed material is incompatible with downstream facilities.				
Residual Likelihood:	Unlikely	Basis: Agglomeration material has been dissolved previously.		
Residual Consequence:	Critical	Basis: Extended analysis/studies required to develop a disposition pathway.		
Residual Risk Level:	Moderate		Residual Impact Basis: Worst Case: Extended analysis/studies required to develop a disposition pathway.	
Residual Cost Impact (\$K):	<u>Best Case</u> 50	<u>Most Likely</u> 100	<u>Worst Case</u> 250	Most Likely Case: Some additional analytical & developmental work is required.
Residual Schedule Impact (Mos):	1 Mth	2 Mths	3 Mths	Best Case: Work already performed can be used for the evaluation.
Impacted Scope of Work:				
Evaluation Comments:				
Event Comments:				

Risk / Opportunity Assessment Form					
ID Number: 095		Revision: 00		Last Date Evaluated: 16-Jun-08	
Status: Active					
Event Title: Solids Formation in PMT					
Type: Risk Internal Technical			Category:		
Assess. Element: 1.2.5		Title: Solids Handling			
Responsible Org: -			Contact: DA - Satish Shah	Date Identified: 16-Jun-08	
Statement of Event: Solid carbonate product will be dissolved in the PMT. Currently, water is assumed to dissolve the soluble carbonate compounds in the product. Insoluble oxide compounds will be transferred as insoluble particles. Insoluble material forms/accumulate in the PMT.					
Likelihood:	Likely	Basis: Solids formation has occurred during lab testing (WSRC-TR-2008-00236).			
Consequence / Benefit:	Significant	Basis: Solids will form in the PMT preventing transferring out dissolved product. Solids can't be transferred out of the PMT.			
Most Significant Cost Impact (\$k): 500			Most Significant Schedule Impact (Wks): 1 Mth		
Level:	Moderate	Event Trigger:			
Handling Strategy:	Avoid	Description: Evaluate solids dissolution using sodium hydroxide and design and install a sodium hydroxide addition system.			
Handling Strategy Action Items: 095-1 Evaluate use of sodium hydroxide and design features needed., , SRNL - Alan Barnes, 095-2 Design and install a sodium hydroxide addition system, , DS - Sergio Mazul,					
HS Implementation Cost (\$K):	300	Basis: Cost of evaluation and design and instalation of a sodium hydroxide addition system.			
HS Implementation Schedule (Wks):	0	Basis: 4 months duration of evaluation, design and installation can be worked in parallel with the current baseline schedule.			
Other Handling Strategies:					
Statement of Residual Risk: Risk has been avoided.					
Residual Likelihood:		Basis:			
Residual Consequence:		Basis:			
Residual Risk Level:			Residual Impact Basis:		
Residual Cost Impact (\$K):	<u>Best Case</u>	<u>Most Likely</u>			<u>Worst Case</u>
Residual Schedule Impact (Mos):					
Impacted Scope of Work:					
Evaluation Comments:					
Event Comments:					

Risk / Opportunity Assessment Form

ID Number: 096

Revision: 00

Last Date Evaluated: 28-Jul-08

Status: Active

Impacted Scope of Work:

Evaluation Comments:

Event Comments: This opportunity may reduce the risk level of PBS-SR-0014 risks 122 and 184. (Reference Y-RAR-G-00022, Rev 3).

6.6: Crystal Ball Report

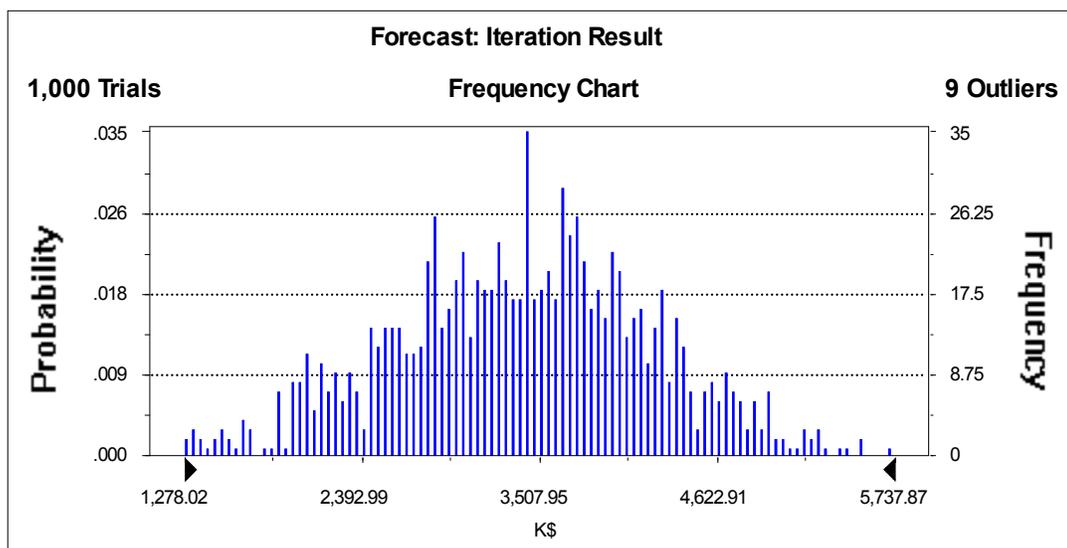
Summary:

Display Range is from 1,278.02 to 5,737.87 K\$

Entire Range is from 876.06 to 6,144.06 K\$

After 1,000 Trials, the Std. Error of the Mean is 26.49

Statistics:	Value
Trials	1000
Mean	3,395.70
Median	3,446.53
Mode	---
Standard Deviation	837.57
Variance	701,522.14
Skewness	-0.13
Kurtosis	3.00
Coeff. of Variability	0.25
Range Minimum	876.06
Range Maximum	6,144.06
Range Width	5,268.00
Mean Std. Error	26.49



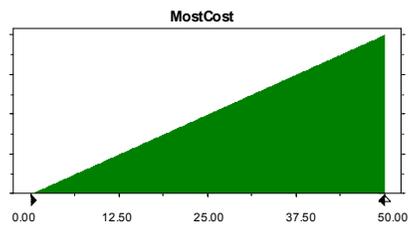
<u>Percentile</u>	<u>K\$</u>
0%	876.06
10%	2,268.26
20%	2,696.16
30%	2,962.52
40%	3,211.38
50%	3,446.53
60%	3,650.54
70%	3,833.70
80%	4,089.21
90%	4,422.73
100%	6,144.06

**Risk 002: Interfaces with Other Facilities
and Projects**

Triangular distribution with parameters:

Minimum	0.00
Likeliest	50.00
Maximum	50.00

Selected range is from 0.00 to 50.00

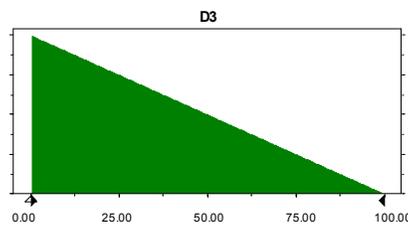


**Risk 003: Sampling and Analysis
Turnaround Impacts Production**

Triangular distribution with parameters:

Minimum	0.00
Likeliest	0.00
Maximum	100.00

Selected range is from 0.00 to 100.00

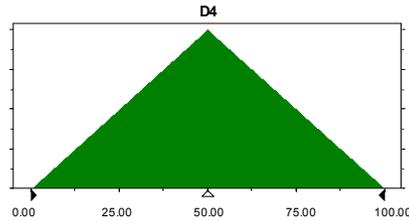


Risk 004: Accessibility for Construction Work

Triangular distribution with parameters:

Minimum	0.00
Likeliest	50.00
Maximum	100.00

Selected range is from 0.00 to 100.00

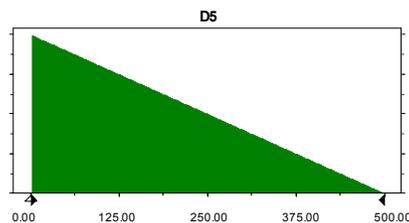


Risk 008: Availability of Construction Equipment

Triangular distribution with parameters:

Minimum	0.00
Likeliest	0.00
Maximum	500.00

Selected range is from 0.00 to 500.00

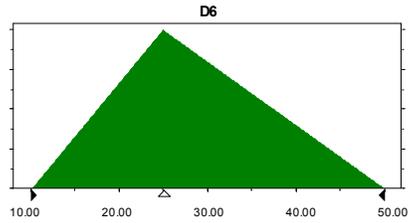


Risk 009: Readiness/ORR Assessment Findings

Triangular distribution with parameters:

Minimum	10.00
Likeliest	25.00
Maximum	50.00

Selected range is from 10.00 to 50.00

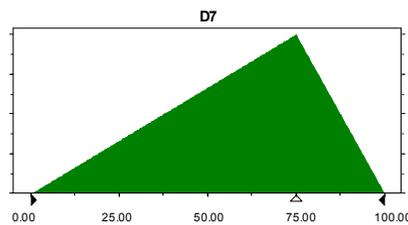


Risk 011: Unsafe Conditions Discovered at Turnover

Triangular distribution with parameters:

Minimum	0.00
Likeliest	75.00
Maximum	100.00

Selected range is from 0.00 to 100.00

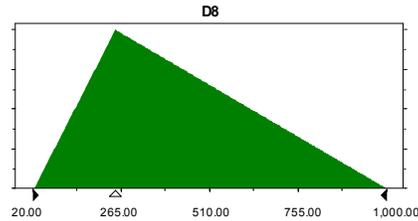


**Risk 013: Safety Basis not Accepted By
DOE**

Triangular distribution with parameters:

Minimum	20.00
Likeliest	250.00
Maximum	1,000.00

Selected range is from 20.00 to 1,000.00

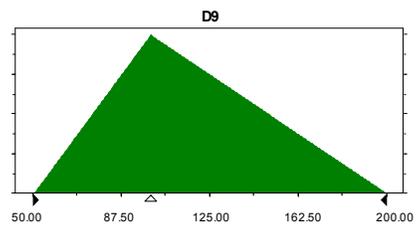


**Risk 018: Product Must Go to a Different
Receipt Tank**

Triangular distribution with parameters:

Minimum	50.00
Likeliest	100.00
Maximum	200.00

Selected range is from 50.00 to 200.00

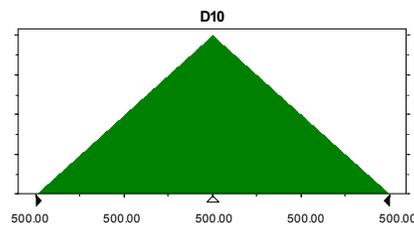


Risk 019: Addition of the GAC to Design

Triangular distribution with parameters:

Minimum	500.00
Likeliest	500.00
Maximum	500.00

Selected range is from 500.00 to 500.00

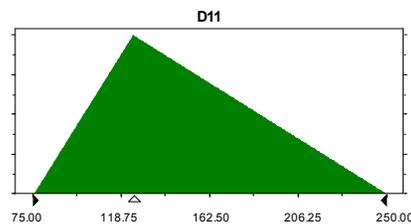


Risk 020: Analysis of 241-96H Structure Shows Not-Qualified for PC-3

Triangular distribution with parameters:

Minimum	75.00
Likeliest	125.00
Maximum	250.00

Selected range is from 75.00 to 250.00

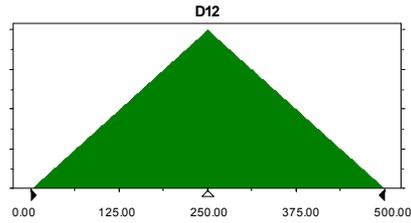


**Risk 022: Interfaces With New Contractor
Impacts Project**

Triangular distribution with parameters:

Minimum	0.00
Likeliest	250.00
Maximum	500.00

Selected range is from 0.00 to 500.00

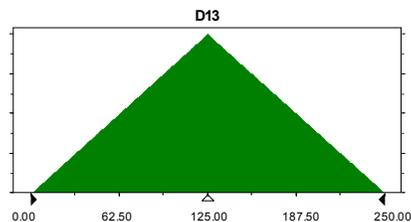


**Risk 023: Design Assumptions and Design
Uncertainties Result In Rework**

Triangular distribution with parameters:

Minimum	0.00
Likeliest	125.00
Maximum	250.00

Selected range is from 0.00 to 250.00

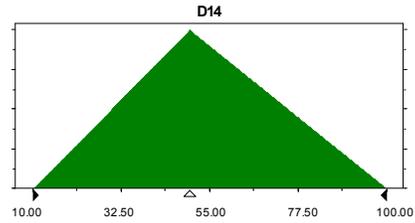


**Risk 024: Insufficient Maintainability
Provided**

Triangular distribution with parameters:

Minimum	10.00
Likeliest	50.00
Maximum	100.00

Selected range is from 10.00 to 100.00

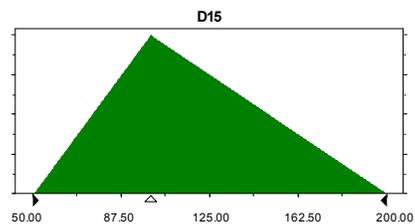


Risk 028: Waste Feed Nozzle Deposits

Triangular distribution with parameters:

Minimum	50.00
Likeliest	100.00
Maximum	200.00

Selected range is from 50.00 to 200.00

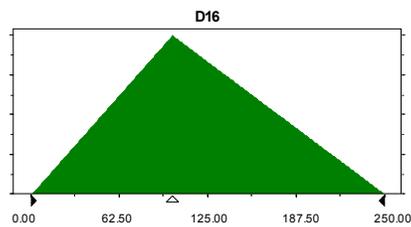


Risk 042: Discovery of Soil Contamination

Triangular distribution with parameters:

Minimum	0.00
Likeliest	100.00
Maximum	250.00

Selected range is from 0.00 to 250.00

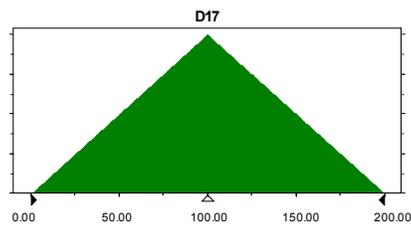


**Risk 043: Engineered Equipment (Skids)
Deliveries do not Support Construction
Schedule**

Triangular distribution with parameters:

Minimum	0.00
Likeliest	100.00
Maximum	200.00

Selected range is from 0.00 to 200.00

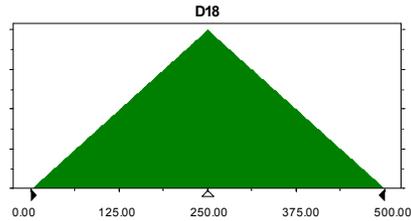


**Risk 052: Simulant and Waste Differences
Impact Commissioning of FBSR**

Triangular distribution with parameters:

Minimum	0.00
Likeliest	250.00
Maximum	500.00

Selected range is from 0.00 to 500.00

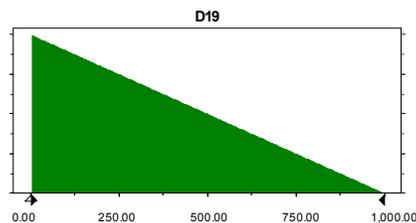


**Risk 055: Slurry Pump Limitations Require
Alternate or Additional Equipment**

Triangular distribution with parameters:

Minimum	0.00
Likeliest	0.00
Maximum	1,000.00

Selected range is from 0.00 to 1,000.00

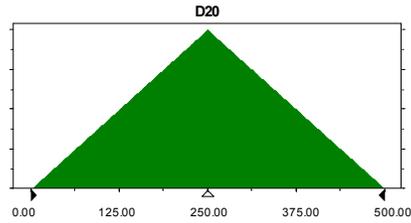


**Risk 056: Facility Support System
Capacity/Life**

Triangular distribution with parameters:

Minimum	0.00
Likeliest	250.00
Maximum	500.00

Selected range is from 0.00 to 500.00

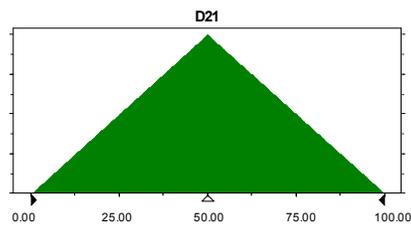


**Risk 057: Integration of Multiple Internal
Technical Agencies**

Triangular distribution with parameters:

Minimum	0.00
Likeliest	50.00
Maximum	100.00

Selected range is from 0.00 to 100.00

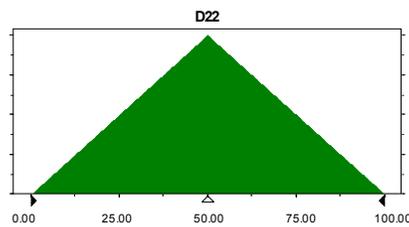


Risk 058: Multiple Design Input Documents

Triangular distribution with parameters:

Minimum	0.00
Likeliest	50.00
Maximum	100.00

Selected range is from 0.00 to 100.00

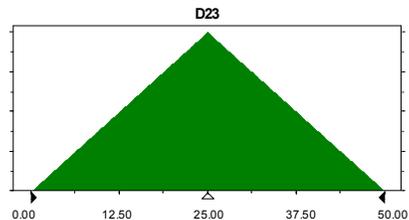


Risk 059: Undefined Disposal Method for Waste Generated During Operations and Eventual D&R

Triangular distribution with parameters:

Minimum	0.00
Likeliest	25.00
Maximum	50.00

Selected range is from 0.00 to 50.00

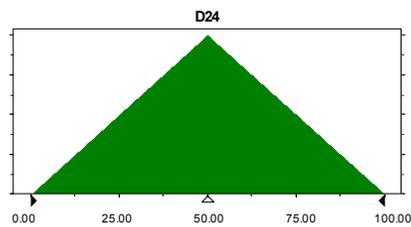


Risk 063: FBSR Equipment Transportation

Triangular distribution with parameters:

Minimum	0.00
Likeliest	50.00
Maximum	100.00

Selected range is from 0.00 to 100.00

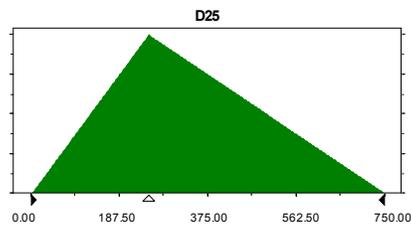


Risk 064: Multiple External Interfaces

Triangular distribution with parameters:

Minimum	0.00
Likeliest	250.00
Maximum	750.00

Selected range is from 0.00 to 750.00

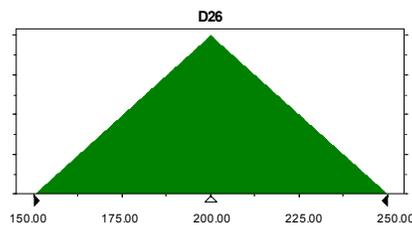


Risk 066: Emergent Startup Issues

Triangular distribution with parameters:

Minimum	150.00
Likeliest	200.00
Maximum	250.00

Selected range is from 150.00 to 250.00

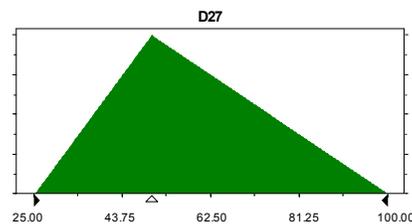


Risk 069: Facility Services Design Complexity

Triangular distribution with parameters:

Minimum	25.00
Likeliest	50.00
Maximum	100.00

Selected range is from 25.00 to 100.00

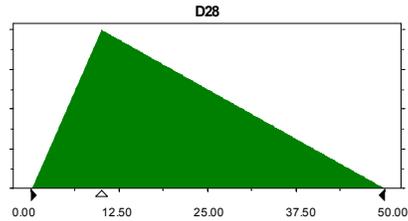


Risk 070: Persistent Contamination Control Issues

Triangular distribution with parameters:

Minimum	0.00
Likeliest	10.00
Maximum	50.00

Selected range is from 0.00 to 50.00

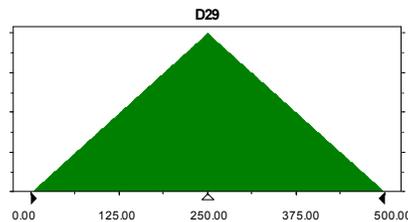


Risk 710: Unacceptable Ventilation Impact

Triangular distribution with parameters:

Minimum	0.00
Likeliest	250.00
Maximum	500.00

Selected range is from 0.00 to 500.00

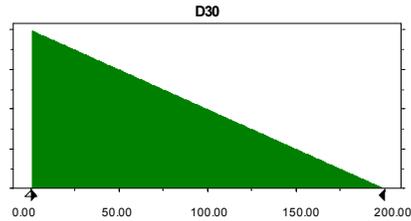


**Risk 073: Secondary Containment Required
For Off-Gas Line**

Triangular distribution with parameters:

Minimum	0.00
Likeliest	0.00
Maximum	200.00

Selected range is from 0.00 to 200.00

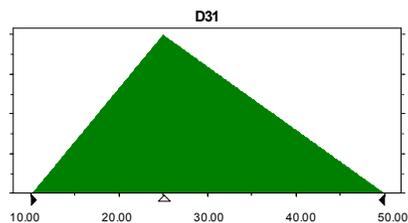


**Risk 076: Aggressive Post Installation
Testing Schedule**

Triangular distribution with parameters:

Minimum	10.00
Likeliest	25.00
Maximum	50.00

Selected range is from 10.00 to 50.00

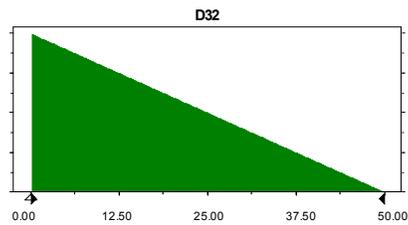


**Risk 077: Positive Pressure Within Process
Requires Additional Confinement
Requirements**

Triangular distribution with parameters:

Minimum	0.00
Likeliest	0.00
Maximum	50.00

Selected range is from 0.00 to 50.00

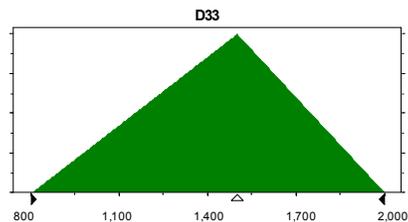


**Risk 078: Scope reductions and conceptual
phase CD-1 package assumptions do not
materialize**

Triangular distribution with parameters:

Minimum	800
Likeliest	1,500
Maximum	2,000

Selected range is from 800 to 2,000

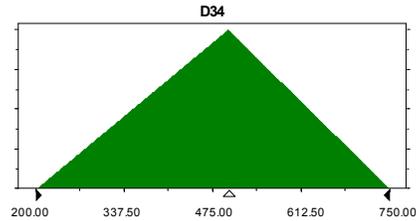


**Risk 079: Adequacy of Existing
Foundations for the FBSR Skid**

Triangular distribution with parameters:

Minimum	200.00
Likeliest	500.00
Maximum	750.00

Selected range is from 200.00 to 750.00

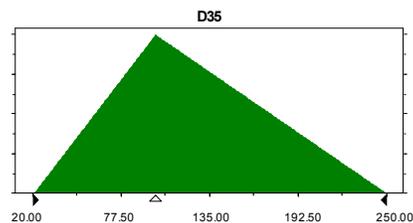


**Risk 082: Organic Carries Over to Product
Mix Tank**

Triangular distribution with parameters:

Minimum	20.00
Likeliest	100.00
Maximum	250.00

Selected range is from 20.00 to 250.00

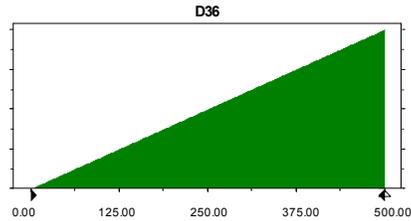


**Risk 083: DWPF Processing Impacted by
FBSR Product**

Triangular distribution with parameters:

Minimum	0.00
Likeliest	500.00
Maximum	500.00

Selected range is from 0.00 to 500.00

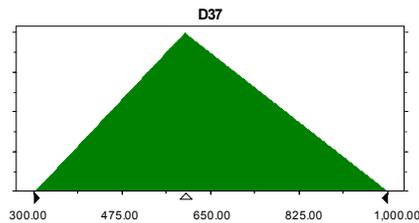


**Risk 085: Maintenance Requires Remote
Operations**

Triangular distribution with parameters:

Minimum	300.00
Likeliest	600.00
Maximum	1,000.00

Selected range is from 300.00 to 1,000.00

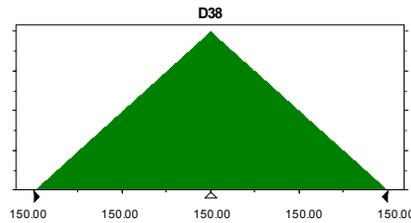


Risk 086: Depleted Uranium is Required to be Added Prior to Transfer to Tank Farm Receipt Tank

Triangular distribution with parameters:

Minimum	150.00
Likeliest	150.00
Maximum	150.00

Selected range is from 150.00 to 150.00

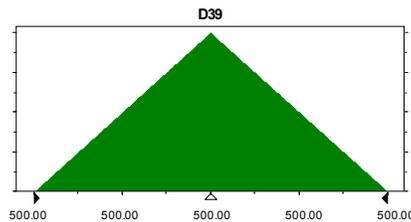


Risk 087: High Silica Content Creates a Processing Problem at 2H Evaporator

Triangular distribution with parameters:

Minimum	500.00
Likeliest	500.00
Maximum	500.00

Selected range is from 500.00 to 500.00

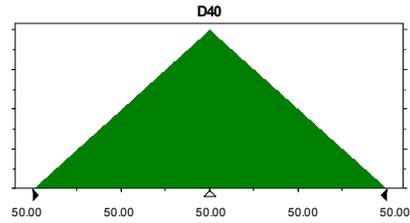


**Risk 092: NESHAP Air Permit (Non-Rad)
Exemption is not Possible**

Triangular distribution with parameters:

Minimum	50.00
Likeliest	50.00
Maximum	50.00

Selected range is from 50.00 to 50.00

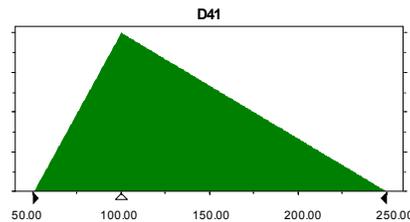


**Risk 094: tartup/Shutdown Creates
Material for Which There is no Disposition
path**

Triangular distribution with parameters:

Minimum	50.00
Likeliest	100.00
Maximum	250.00

Selected range is from 50.00 to 250.00



6.7: Riskometer

TTP RISKOMETER
STATUS AS OF 9/23/2008

<i>Risk Number</i>	<i>Risk Title</i>	<i>Risk Level</i>	<i>Closed</i>	<i>Acceptable Risk</i>	<i>Minor Concern</i>	<i>Major Concern</i>	<i>Remarks</i>
001	Funding Availability	High			●		Vendor bid will be evaluated by CCB.
002	Interfaces with Other Facilities and Projects	High			●		Keep H-Tank Farm Facility Project Owners & Managers informed about project needs/progress. Maintain integrated project schedule with appropriate logic ties between project & facility activities.
003	Sampling and Analysis Turnaround Impacts Production	Moderate			●		Develop Sample & Analytical Plans well in advance of actual operations including a strategy where a sample of every transfer is not required, i.e. take weekly or monthly samples similar to what is done for the evaporator overheads. Ensure back-up instrumentation is available in case of equipment failure. Develop a contingency plan if analytical results are not available, i.e. tighten the acceptable tolerance of the latest sample to verify results and to justify continued operation.
004	Accessibility for Construction Work	High			●		Coordinate work with operations and other projects through participation in facility Work Window Lock-ins, 8 Week Lookaheads (T8s), and Plan of the Days (PODs). When activities are locked in, ensure critical resources (i.e. rigging, radcon, IH, etc.) are onboard and ready to support.
007	DOE Directed Changes to Technical Requirements	High			●		Changes to the Technical baseline imposed by DOE would be a change in project scope and a BCP would be generated.
008	Availability of Construction Equipment	Moderate			●		This risk is accepted based on priority being requested for on-site crane. Although priority for crane usage is requested, a higher priority could still "bump" this project.
009	Readiness/ORR Assessment Findings	Moderate			●		Project Team develop and perform detailed management checklist prior to beginning RA. Continued engagement of DOE, Operations and Safety organizations in the system design reviews and testing activities. DOE Operations and Safety organizations to participate in test activities conducted before the DOE ORR. Engage the DOE ORR Team prior to the SAT to enable the team to become familiar with the systems and operations.
011	Unsafe Conditions Discovered at Turnover	Moderate			●		SMI-51 walkdown team to participate in design reviews and weekly walkdowns.
012	Stakeholder Participation	Moderate			●		Develop communication plan for involving stakeholders. Keep Stakeholders/Senior Management informed of R&D results. If stakeholders do impose additional design/operational /research/testing requirements on the project, a BCP will be developed.
013	Safety Basis not Accepted By DOE	High				●	Ensure formal/informal DOE involvement during safety basis development and prior to WSRC request for approval to avoid final minute surprises. DOE will participate in the CHA meetings, and SIRCs. Briefing of positions will be given to DOE Engineering at key points in the development of the safety basis.
014	Resources Not Available	Moderate			●		Establish project baselines and key contract milestones. Maintain timely funding authorizations and accurate resource forecasts for all support organizations.
015	Safety Basis Requirements Change From 50% to 95% Meteorology	Moderate				●	High BDER - Scope included. Low BDER - Scope not included; a trend will be issued if this risk is realized. SDS and PSDAR will gain DOE approval.
016	Implementation of DNFSB Recommendation 2004-2 Required	High				●	High BDER - Scope included. Low BDER - Scope not included; a trend will be issued if this risk is realized. SDS and PSDAR will gain DOE approval.
018	Product Must Go to a Different Receipt Tank	Moderate		●			Perform analysis of potential feed. Develop a backup plan to identify a tank capable of receiving FBSR product. Identify a transfer path to backup tank. Develop design to enable transfer path ready for issuance should it be required. New Project strategy is to send product to HDB-7 which can access tanks 38-43.

TTP RISKOMETER
STATUS AS OF 9/23/2008

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019	Addition of the GAC to Design	High			●		Test data and preliminary evaluation indicate mercury removal will not be required.
020	Analysis of 241-96H Structure Shows Not-Qualified for PC-3	Moderate			●		Perform the PC-3 Analysis during preliminary design to identify impacts prior to baselining the project.
022	Interfaces With New Contractor Impacts Project	Moderate			●		Ensure early involvement of subcontractor in preliminary design. Expedite preliminary design.
023	Design Assumptions and Design Uncertainties Result In Rework	High				●	Determine the need for new electrical substation; Define spatial limitations clearly in procurement specification; Perform an HVAC study to determine the adequacy of the existing system and develop and issue a viable automation and controls strategy. Verify the existing slurry pumps and other equipment will be available to mix the bulk contents of Tank 48 and that new slurry pump VFDs for Tank 48 will be available to support FBSR operation.
024	Insufficient Maintainability Provided	High				●	Detailed SOW requires maintainability as a design attribute.
027	Availability of Consumables	Moderate			●		Perform identification of critical spares/resources. Set up parts in stores. Where practical, consumables critical to this project and with lead times greater than one week shall be set up in site stores.
028	Waste Feed Nozzle Deposits	Moderate			●		Perform ESTD testing with Tank 48 simulant. Engineering Scaled Testing Lessons Learned will be incorporated into clean in place design. Inspect DMR feed nozzle for deposits after ESTD testing.
029	Scale-up of FBSR Process Encounters Problems	High			●		The Hazen tests will validate design flow rates of Tank 48 simulate feed. Expected flow rate will be based on a smaller 15" DMR bed unit. The design for the Tank 48 unit will be a 20" bed DMR. The inability of the scaled-up FBSR to meet throughput requirements is not considered a major risk to the project.
033	Long Lead Procurement is Denied or Delayed	High				●	Approved schedule details CD-3A as a milestone.
034	Particle Size Control Problems	Moderate			●		Screen placed at the suction of Tank 48 transfer pump to prevent large particle from entering the feed nozzle.
038	Availability Cannot be Achieved (LLWDSP ISSUE)			●			Have Vendor engineers on hand during vendor testing, startup and cold runs.
042	Discovery of Soil Contamination	Moderate			●		Perform early soil samples.
043	Engineered Equipment (Skids) Deliveries do not Support Construction Schedule	High			●		FPEG member has been assigned to the Project Team to expedite and track procurements.
046	Scaling Occurs in the DMR During Operation (operational vulnerability)				●		Inspect DMR for build-up during all testing and develop ops and maintenance procedures for preventing build-up or cleaning during radioactive operation.
050	Tank Farm Equipment Failure (LLWSDP ISSUE)			●			Handling of this risk is presently being performed by Tank Farm Operations as part of PBS-SR-0014 RMP actions by establishing system health evaluation of key systems and implementing the requirements of the evaluation. This will reduce the risk level such that it is no longer considered an unacceptable risk.
052	Simulant and Waste Differences Impact Commissioning of FBSR	High				●	To date, extensive simulant development has been performed to reduce the likelihood of this risk being realized and pilot facility testing has been performed. Additional real waste testing will be performed at SRNL.
055	Slurry Pump Limitations Require Alternate or Additional Equipment	High				●	The flowsheet assumption is that the tank can be pumped out to within 2 inches of the bottom. When considering limitations on slurry pump, the design of pump does not allow sufficient low level to be achieved.

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056	Facility Support System Capacity/Life	Moderate			●		Determine the utility needs earlier during design and verify their availability. Schedule impact avoided.
057	Integration of Multiple Internal Technical Agencies	High			●		PEM is assigned to coordinate this effort and have regular Engineering Meetings with the total engineering team.
058	Multiple Design Input Documents	Moderate			●		PEM assigned to coordinate this effort and have regular Engineering Meetings with the total engineering team.
059	Undefined Disposal Method for Waste Generated During Operations and Eventual D&R	High			●		Identify disposal path upfront in preparation for filter replacement in waste disposal plan. Current conceptual flow sheet does not show Hg filter.
061	Facility Space Limitations	High				●	Asbuilt of available space within the building is complete. Space availability is specified requirement for the FBSR Vendor.
062	Project Strategy Does Not Support Tank 48 Return to Service Need	High			●		Approved Project BCP is in alignment with current LLWDSP.
063	FBSR Equipment Transportation	Low			●		Plan up front in the design of the skids and coordinate with the Vendor to ensure special vehicles are available. Perform receipt inspection. Refractory is fragile and special precautions are needed.
064	Multiple External Interfaces	High			●		Schedule early approval of long lead procurements to ensure critical vendor information is available in a timely fashion. Integrate project activities into facility schedule. Establish project milestones to manage schedule float and visibility of project priorities.
066	Emergent Startup Issues	High				●	Perform ESTD testing.
069	Facility Services Design Complexity	Moderate			●		Specify and/or coordinate the tie-in point in the specification or during the review and approval of the Vendor design.
070	Persistent Contamination Control Issues	High				●	Design equipment and facility for ease of decontamination. During cold runs potential contamination pathways will be investigated.
071	Unacceptable Ventilation Impact	Moderate			●		During preliminary design obtain HVAC requirements for the FBSR skid and confirm that the existing system is adequate or identify what modifications are required.
072	Module Handling and Installation	Low			●		Ensure requirements are placed in procurement specification for all handling equipment to be provided by the vendor, vendor design and lifting procedures to be reviewed. Vendor design has not been finalized.
073	Secondary Containment Required For Off-Gas Line	Moderate			●		Develop parallel options for the off-gas system tie in such as including the filter assemblies within the Hold Tank Room or establishing a deviation from site codes and standards to allow routing of the line outside of the building.
074	Heel Removal and Processing Does Not Meet Expectations	High				●	Use a successive regimen of tank flushes including inhibited water and salt solution to flush the Heel and design and deploy a pumping system using multiple draw off points at different elevations to pump out the slurry.
075	Design/ Operational Life Is Inadequate (Operational Vulnerability)	High			●		Approved procurement specification ensures a robust design of major equipment. During startup testing, focus on identification of adverse indications that may reduce life expectancy and correct whenever feasible.
076	Aggressive Post Installation Testing Schedule	Moderate			●		Although PS SSCs require a commensurate level of QA, include additional QA inspection in critical installation periods to ensure correct installation and eliminate rework.
077	Positive Pressure Within Process Requires Additional Confinement Requirements	Low		●			Confinement strategy document being developed for the TTP project.

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078	Scope reductions and conceptual phase CD-1 package assumptions do not materialize	High				●	List all key assumptions. Further develop assumptions during preliminary design with Operations involvement. Keep Senior Management engaged in cost savings measures to assure support and influence to address organizational impacts and project cost control.
079	Adequacy of Existing Foundations for the FBSR Skid	Moderate				●	Perform the required analysis early in preliminary design. Shielding requirements for a higher curie field may be imposed.
080	Unable To Determine Permissible Residual TPB Limit Has Been Met	Moderate			●		Develop a more practical criterion for determination of residual TPB level based on measuring the TPB in Salt solution flush effluents, prediction of residual TPB transportation to downstream facilities and potential impacts to those facilities e.g. flammability concerns etc. Implement this verification method during Tank 48 heel processing.
082	Organic Carries Over to Product Mix Tank	Moderate			●		Specifying a design constraint to the vendor at initial design to prevent organics from entering the PMT. Ensuring design constraint is met during the design
083	DWPF Processing Impacted by FBSR Product	High			●		Performing further evaluation of the process for reducing of carbon fines in the final product stream.
085	Maintenance Requires Remote Operations	High				●	Designing items requiring maintenance with easy access, removal and replacement features. Providing shielding portals for access and rigging/hoisting
086	Depleted Uranium is Required to be Added Prior to Transfer to Tank Farm Receipt Tank	Moderate			●		Perform NCSE/NCSA and provide ability to add depleted uranium to Tank 48 or Product Mix Tank.
087	High Silica Content Creates a Processing Problem at 2H Evaporator	High				●	Performing testing to determine soluble silica expected in the Tank Farm receipt tank. Evaluating impact to 2H evaporator system to determine if additional action is required to reduce/remove silica.
089	Technology Issues Make Deployment Impractical	High				●	Develop VVAO as a backup technology in parallel with FBSR implementation.
090	Interim Standard 1189 Guidance Differs from Approved Standard	High			●		The CD-1 range estimate has been increased from (\$96 - \$138M) to (\$100 - \$150M) to allow additional contingency funds for this risk. The Low BDER does not include this scope therefore a trend will be issued if this risk is realized.
091	FHA Requires Separation from ARP that Results in Additional Project Scope	TBD	● ← ←				CLOSED - This is no longer considered a risk as ARP will not be operating within 241-96H concurrently with TTP.
092	NESHAP Air Permit Exemption is not Approved	High			●		Develop data and perform calculation to determine emission levels of unit in sufficient time to allow a permit to be requested should the thresholds be exceeded.
093	Accident Analysis Determines a Greater MAR	High		●			Safety Class controls have been priced and included in the High BDER estimate, therefore if this risk is realized, the High BDER scope will be implemented via an appropriate change control mechanism.
094	Startup/Shutdown Creates Material for Which There is no Disposition path	High				●	Evaluate properties of partially processed DMR material and perform testing to determine/identify disposition path. Complete ESTD testing and roll lessons learned into control system design.
095	Solids Formation in PMT	Moderate		●			Evaluate solids dissolution using sodium hydroxide and design and install a sodium hydroxide addition system.
							● Risk has been closed ● Not a problem, no issues at this time ● Minor concern ● Major concern
							Content changed since last update