

**STATEMENT OF WORK**  
**FOR**  
**REQUISITION 1A1265**

**1.0 SCOPE**

**General Description of Services**

In support of Westinghouse Savannah River Company (WSRC) general management objectives, the Affiliate shall provide engineering and consulting services in the area of safety analysis, safety documentation, regulatory, licensing and criticality analysis functions for Operating Divisions. Activities will include preparation of authorization basis documents (Safety Analysis Report (SAR), Basis for Interim Operation (BIO), Technical Safety Requirements (TSR), Hazard Analysis (HA), Health and Safety Plan (HASP), Auditable Safety Analysis (ASA), etc.), development of regulatory positions, creation of nuclear criticality safety evaluations and maintenance of methodologies for such analyses. The Affiliate shall, under the Site Engineer direction, maintain responsibility for the Safety Basis Document and Criticality Safety programs for the SRS. Other related engineering activities shall also be provided per request of the Divisions.

The Affiliate shall provide expertise in support of the ESH&QA Division implementation of the Integrated Safety management Program at the SRS. The Integrated Safety Management Program ensures that work is accomplished in a manner which protects the environment and safety and health of workers and the public and is in compliance with applicable requirements. The Affiliate is expected to identify hazards, evaluate those hazards, identify required controls, and support SRS organizations in implementing those controls. The Affiliate shall support implementation of recommendations from other organizations (such as the Defense Nuclear Facilities Safety Board (DNFSB) and state and regulatory agencies) which are accepted by DOE and directed by WSRC.

**2.0 REFERENCES**

Not used

**3.0 WORK REQUIREMENTS**

**3.1 Technical Requirements**

**3.1.1 Savannah River Program Development**

**3.1.1.1 *Safety Documentation Program***

Under the Site Chief Engineer's direction, the Affiliate will provide and maintain a documented Safety Basis Documentation program for SRS and serve as the functional program manager for this function. The Affiliate

will develop and maintain or support development and maintenance of all site procedures and manuals for methodologies related to authorization basis documentation, the unreviewed safety question process, the new information process, functional classification, hazard assessments, and process safety management. The Affiliate will be responsible for programmatic assessments of this program.

#### 3.1.1.2 *Criticality Safety Program*

Under the Site Chief Engineer's direction, the Affiliate shall provide and maintain a documented Criticality Safety program for the SRS and serve as functional program manager for this function. The Affiliate will develop and maintain all site procedures, manuals, and policies regarding the Criticality Safety program, including setting standards for all site criticality committees. The Affiliate shall be responsible for the programmatic assessments of the Criticality Safety program.

#### 3.1.1.3 *Integrated Safety management System Program Management Support*

The Affiliate shall assist the ESH&QA Division to develop Integrated Safety Management Program descriptions for Savannah River Site that are compliant with the DOE DNFSB Recommendation 95-2 Implementation Plan. This assistance will provide for interface with DOE-SR and HQ personnel in program development and will provide for the interface with other agencies as DOE-SR and WSRC so direct.

The Affiliate will provide assessments, as requested, to evaluate existing programs and safety basis documents in operating facilities against the DOE DNFSB Recommendation 95-2 Implementation Plan.

The Affiliate will provide assessments of the facilities, as requested, to identify any gaps between the current facility safety management program implementation and the Integrated Safety Management Program. The Affiliate shall develop a plan, as requested; to identify all activities required to fully implement an Integrated Safety Management Program at the facility. The Affiliate shall provide management for the implementation of the plan and will maintain a documented linking database between the Program requirements and the associated Savannah River Site or facility specific procedures and programs that implements those requirements.

#### 3.1.2 **Program Implementation**

In accordance with the Integrated Safety Management Program, for work to be authorized, the associated evaluation of hazards and identification of controls must be performed to assure the protection of the public, worker,

and environment. These activities will be documented in safety basis documents that will become the basis for the authorization agreement for performing the work. The scope of work being authorized can be at an activity level, or at a facility level or a combination of both. The Affiliate will maintain the ability to obtain DOE approval of Facility Authorization Agreements as described in DOE's DNFSB Recommendation 95-2 Implementation Plan. The Affiliate shall maintain the processes and procedures, and shall perform and document the activities, for the following:

*3.1.2.1 Work Scope Identification including Hazard material inventory and source term development*

The Affiliate shall maintain a process for determining and documenting the inventory of hazardous material (radiological and chemical) to be evaluated. The Affiliate shall maintain a process for identifying the type of analyses and safety basis documentation required based on the hazardous material inventory.

Given the structures and associated activities to be included in the scope, the Affiliate shall characterize the current hazardous materials and develop qualified data to support the development of safety basis documents. The Affiliate shall document and maintain the 'authorization basis inventory' for the identified facilities and activities.

The Affiliate shall issue a task plan for the development of the safety basis documents along with integrated schedules for overall planning and resource allocation. The Affiliate shall manage the implementation of the task plan.

*3.1.2.2 Hazard and Safety Analysis including: NEPA Safety Analysis, Emergency Planning Hazard Analysis; OSHA Process Safety Management; EPA Risk Management Program; Authorization Basis including Criticality;*

The Affiliate shall maintain a process to identify hazardous conditions associated with the hazardous material (radiological and chemical) and energy sources that adversely impact the public, worker and environment. The Affiliate shall maintain a screening process for determining the extent of hazard and accident evaluation and control identification required for the identified hazards. This process will be integrated with other Savannah River programs to assure all hazards are covered appropriately into an Integrated Safety Management Program.

Based on the hazardous material inventory and facility configuration, the Affiliate shall identify and document all hazardous conditions that exceed

the screening criteria, identify and document which conditions require hazard analysis (frequency and consequence determination), perform the hazard analysis, and identify if additional accident analyses are required.

The Affiliate shall develop, document and defend accident analysis scenarios for normal operations, abnormal events, and accident conditions. Source terms, subsequent doses and airborne concentrations shall be calculated and documented by the Affiliate.

The Affiliate shall develop and maintain a criticality safety methodology consistent with regulatory requirements and industry standards. The Affiliate shall perform nuclear criticality safety and analyses and double contingency analyses. The Affiliate shall perform radiological shielding analyses and radiological engineering design as required.

The Affiliate shall provide nuclear physics applications and analysis.

The Affiliate shall develop, maintain and provide for the defense of evaluation guidelines current with DOE and other regulatory agencies directions. The Affiliate shall compare estimated or calculated doses and concentrations against the evaluation guideline to support the identification of controls.

### 3.1.2.3 *Identification of Controls*

The Affiliate shall maintain the Savannah River process for the identification of administrative and engineered controls (i.e., Functional Classification) that are tailored to the activities to be performed and the associated hazards. The process would establish a safety envelope by: (1) determining the necessary and sufficient design, operation, procurement, and maintenance requirements for facility structures, systems and components (SSCs) and Administrative Controls (ACs) credited in the hazard analyses, accident analyses, and criticality analyses: (2) identification of Safety Class and Safety Significant SSCs for approval by the Design Authority by comparing them against evaluation guidelines which encompass both radiological and chemical concerns, and (3) identification for approval by the Design Authority and documentation of additional Defense-in-Depth items which require classification to protect receptors (public, facility workers, and the environment) from exposure to hazardous material or hazardous energy. The process for selecting controls will consider the estimates of health and safety effects, economic impacts, and programmatic impacts as well as the current facility design.

Based on the identified controls, the Affiliate shall identify the operational/safety requirements that are to be protected, and shall develop and maintain the necessary Safety Limits, Limiting Control Settings,

Limiting Conditions for Operations, and Administrative Controls. The Affiliate shall document and defend controls selected (i.e., TSR, OSR, etc.). The Affiliate shall provide interpretations for controls and required. The Affiliate shall maintain lessons learned from control implementation.

#### 3.1.2.4 *Control Implementation and Work Authorization*

The Affiliate shall establish and maintain the Savannah River program for the development and maintenance of authorization basis and other safety basis documents. The program will provide for the integration of new missions, regulatory changes, design changes, and facility modifications into safety basis documents.

The Affiliate shall support the presentation and defense of safety basis documents to DOE and regulatory authorities and agencies (e.g., DNFSB), as requested by DOE-RS and WSRC.

#### 3.1.2.5 *Worker Safety Program Policy Support*

The Affiliate shall provide support for the Savannah River Site Worker Safety Program that identifies all of the requirements for worker safety hazard identification and control. The Worker Safety Program will include specified controls for the Category I and II accidents analyzed for the facility SARs and BIOs. The program will ensure the Category III and IV events are identified and appropriate controls defined.

#### 3.1.2.6 *Work Execution*

The Affiliate shall provide regulatory support for the facilities.

The Affiliate shall maintain the Savannah River Site Potential Issues Program for the evaluation of new information and proposed activities and their impact on the current authorization basis. The Affiliate shall develop and present training on this program.

#### 3.1.2.7 *Feedback*

The Affiliate shall provide support to the facilities in evaluating proposed activities, new information, and potential inadequacies in safety analysis.

The Affiliate shall identify required safety basis document revisions, develop plans for development of revisions, and report the status of all safety basis document activities to facility management.

## **3.2 WSRC Furnished Materials, Equipment, or Services**

### **3.2.1 Training and Badging**

SRS-specific training and badging will be required for all Affiliate employees operating within the boundaries of SRS.

WSRC or its designee shall provide Affiliate personnel with the training and badging described below.

All employee-related costs and expenses for such training and badging shall either be charged to the primary task requiring the training or separately, if several tasks require the training to be performed. Such costs include the employees' time while attending the classes and are currently reimbursable under the WSRC contract.

The courses required to perform the Affiliate scope, depending on areas assigned and responsibilities, which include but are not limited to the following:

- General Employee Training/Consolidated Annual Training
- Site, Facility, and Job Specific Training and Requirements
- E3S Site Proximity Badging
- Reactor Area Test Badging
- RTF Nitrogen Training Verification
- Tritium Facility Orientation Training
- C Area Emergency Requirements
- Respirator Fit Training
- Nuclear Material Processing Division Training and Dress Out Requirements
- Radiation Worker Training I and II
- Bioassay, Fastscan and Substance Abuse Random and Scheduled Testing

### **3.2.2 Transition Support**

Implementation of this Interworks Requisition (IWR) requires transition of personnel from WSRC employ and work locations at Savannah River Site to Affiliate employment at locations both on and off the Savannah River Site. In order to assure that this transition is performed in a manner which does not interfere with the efficient operation of the Savannah River Site the WSRC and Affiliate agree as follows:

- a) The Affiliate will provide, no later than two weeks prior to the initiation of the period of performance of this IWR, a Transition Plan which delineates support which may be received by WSMS from WSRC to ensure the efficient transition of personnel and

information from WSRC to WSMS. This support may be provided for up to ninety days following the initiation of the period of performance of this IWR;

- b) WSRC will permit, pursuant to this Plan, continued occupation of SRS facilities on a short-term basis by Affiliate personnel during transition from SRS to the off-Site location. This continued occupation will include normal use of office equipment and supplies, such as telephones, fax equipment and copiers;
- c) WSRC will permit, pursuant to the plan, continued short-term use of government computer equipment for use on government funded tasks only including all required software and data, until Affiliate computing equipment is operational;
- d) WSRC will permit, pursuant to the Plan and subject to security requirements, copying and transportation to Affiliate facilities of documents (in both hardcopy and electronic form), software and records required for the execution of this IWR;
- e) WSRC will permit and reasonably support the establishment of telecommunication capability between Affiliate facilities located off the Savannah River Site and the Savannah River Site to assure the same level of Safety management support as SRS has come to expect. These capabilities should include a number of accounts for connection with local SRS systems such as cc:Mail, ShRINE and WISDOM (and their successors) and the capability to connect with these systems from the off-Site Affiliate facilities.

### 3.2.3. Collocated Personnel

It is expected that certain tasks to be performed by the Affiliate under this IWR will require a number of Affiliate personnel to be collocated on the Savannah River Site. These tasks will normally be related to liaison with WSRC organizations or DOE-SR or performance of activities closely related with the operation of SRS facilities. In order to assure successful completion of such tasks, such Affiliate personnel should be provided the following:

- a) office work space and clerical support sufficient to perform the engineering services tasks at that facility;
- b) the use of computer equipment, meeting SRS security requirements;

- c) the use of telecommunications equipment (Telephone, facsimile, Internet access, cc:Mail account, WISDOM, ShRINE).

#### 3.2.4. Telecommunication Support

WSRC will provide the Affiliate with an adequate number accounts for connection with local SRS systems such as ccMail, ShRINE and WISDOM (and their successors) and the capability to connect with these systems from the off-Site Affiliate facilities.

“Capability,” in this context, means the tools, techniques and passwords required for the Savannah River Site computer security systems to permit connection with and utilization of the relevant systems. “Capability” does not include or mean common computer or telecommunications hardware such as telephone and/or modems, but does include any hardware whose unique application is to permit connection with SRS computer systems.

#### 3.3 Quality Requirements

Where WSRC requests that SRS policies, procedures, manuals, etc. be developed and maintained by the Affiliate, the Affiliate will use the WSRC review, approval, and issuance process. The Affiliate will prepare the documents or revisions and submit them to the appropriate WSRC organization. The Affiliate will respond to all comments and will implement changes as required. WSRC is responsible for distributing the document for comment, providing the comments to the Affiliate, and for issuing the final document. For work conducted under this IWR, the Affiliate’s Quality Assurance Program will meet the requirements of the WSRC Quality Assurance Manual 1Q as applicable (e.g., Document Control, Software Control, Design Control).

#### 3.4 Site Conditions

Where delivery of services requires the physical presence of Affiliate personnel at a location within WSRC, Affiliate personnel shall comply with all WSRC policies, procedures, and or directives applicable to that physical location (e.g., WSRC Employee Safety Manual, 8Q).

#### 3.5 Period of Performance/Schedule

See Articles II, III, and IV of the Interworks Requisition.

### 3.6 Deliverables

The activities and deliverables are provided in three categories:

- 1) **Affiliate Exclusive Tasks:** Those types of activities that always require the use of the Affiliate's safety management expertise. These activities are directly related to the development of safety basis documents, licensing support, critical analysis, or radiological engineering. For SRS, these tasks are exclusively performed by the Affiliate. The specific list of activities and deliverables is provided in Section 3.6.1.
- 2) **Affiliate Exclusive Support Services:** Those types of activities which require varying amounts of operational and safety management expertise. Tasks involving these activities will be performed either wholly or in part by the Affiliate when WSRC determines that the safety management expertise needed to perform the task is at a significant level compared to the required operational expertise. WSRC will perform these tasks internally if the Affiliate is not required to perform them. The specific list of activities and deliverables is provided in Section 3.6.2.
- 3) **Affiliate Support Services:** Those types of activities which require operational, safety management, or other expertise in varying amounts. Tasks involving these activities will be performed either wholly or in part by the Affiliate when WSRC determines that the safety management expertise needed to perform the task is at a significant level compared to the other required expertise. WSRC will perform the tasks internally or have them performed by other parties if the Affiliate is not required to perform them. A list of activities is provided in Section 3.6.3.

#### 3.6.1 Affiliate Exclusive Tasks

##### 3.6.1.1 Policies, Procedures and Manuals

The Affiliate shall maintain and provide interpretation assistance to WSRC for the following Policies, Procedures and Manuals and any new Policies, Procedures and Manuals developed concerning the subject matter:

- Procedure Manual E7, Conduct of Engineering and Technical Support Section 4 Procedures 2.25, Functional Classification
- Procedure 2.72, ALARA Design Considerations and Radiological Engineering
- Procedure Manual SCD-3, Nuclear Criticality Safety Manual

- Procedure Manual 6Q, SRS Emergency Plan Emergency Management Program Procedure Manual, Volume II,
- Procedure EMPP-001, Standards for Development and Maintenance of Hazard Assessments
- Procedure EMPP-002, Standards for Development and Maintenance of Emergency Action Levels
- S-ESR-G-00002, Technical Programs Screening Quantity (TPSQ) Values for the Use in Facility Hazard Assessments
- WSRC-TR-94-0466, Safety Analysis Report Preparation Guidelines
- WSRC-RP-95-460, SAR Human Factors Checklists
- WSRC-RP-95-915, Savannah River Site Hazard Analysis Generic Initiator Data Base
- WSRC-TR-93-262, SRS Generic Data Base Development
- DP-1633, Component Failure-Rate Data with Potential Applicability to a Nuclear Fuel Processing Plant
- DPST-87-642, Data Base Development and Equipment Reliability for Phase I of the Probabilistic Risk Analysis
- DPST-86-401, SRP Generic Database
- WSRC-TR-93-581, Savannah River Site Human Error Data Base Development for Nonreactor Nuclear Facilities
- WSRC-IM-96-133, WSRC Nuclear Criticality Safety Methods Manual
- WSRC-IM-96-168, SCALE Criticality Validation Manual
- WSRC-IM-96-169, MCNP Criticality Validation Manual
- WSRC-TM-93-9, Functional Classification Methodology Manual
- WSRC-RP-95-001, Safety Document Integrated Work Process Guidelines and Methods
- WSRC-MS-92-206, Toxic Chemical Hazard Classification and Risk Acceptance Guidelines for use in DOE Facilities, Craig et. Al., 3/24/95

### 3.6.1.2 Definition of Services

The Affiliate shall perform the following activities and develop and maintain the identified deliverables:

1. Perform the preliminary hazard assessment and issue the Hazard Assessment Document (HAD), including identification of Hazard Categorization and Hazard Classification
2. Lead the Process Hazard Reviews and issue the reports
3. Perform and document Hazard Analyses related to Environmental Assessments (EA), Environmental Impact Statements (EIS), Bases for Interim Operations (BIO), Safety Information Documents (SID), Safety Analysis
4. Reports (SAR), Health And Safety Plans (HASP), and Auditable Safety Analysis Documents (ASAD)
5. Perform and document emergency preparedness hazard assessments
6. Develop and document Emergency Action Level procedures

7. Perform and document cost/benefit analyses in support of the backfit evaluation for Safety Class SSCs.
8. Develop and document accident scenarios for normal operations, abnormal events, accident conditions, and beyond design basis accident conditions. This includes calculation of the initiators and progression of accident sequences, including design accident progression event trees
9. Perform Probabilistic Risk Assessments
10. Identify and document the facility or activity hazardous material inventory
11. Identify and document the facility or activity hazardous conditions
12. Perform Failure Modes and Effects Analysis related to safety basis documents
13. Perform and document quantitative accident analyses to determine bounding airborne releases or other forms of releases due to accident scenarios. These analyses include assessment of energy sources that can disperse material and also features that can reduce or mitigate the amount of inventory
14. Perform and document radiological doses, chemical concentrations, and other consequences associated with accident scenario releases
15. Compare calculated consequences to Evaluation Guidelines and other regulatory criteria
16. Maintain methodology for accident and consequences analysis consistent with DOE APAC project
17. Perform probabilistic source term/dose prediction model development
18. Develop, implement and maintain chemical and toxicological evaluation methods for safety analysis
19. Perform and document self-protection analysis for spent fuel
20. Perform and document Criticality Accident Alarm System placement analysis
21. Perform and document twelve rad exclusion zone analysis
22. Perform programmatic assessments for the Safety Documentation and Criticality Safety functional areas
23. Provide Chairmanship of the WSRC Nuclear Criticality Safety Review Committee
24. Provide technical review and approval of all WSRC documents that involve nuclear criticality safety issues (NCSE, DCAs, SARs, procedures, etc.)
25. Perform and document Nuclear Criticality Safety Evaluations
26. Perform and document Double Contingency Analyses
27. Review Nuclear Criticality Safety Limits for Fissile material handling and storage
28. Review and approve Nuclear Safety Data Sheets as criticality subject matter experts
29. Provide Facility Criticality Assessments
30. Develop Isodose curves for emergency planning zone evaluations

31. Provide review of equipment and process modifications for criticality requirements
32. Provide radiological engineering project design input and perform reviews for ALARA, shielding, ventilation and monitoring
33. Perform radiological engineering process modification planning for ALARA requirements and precautions
34. Support ALARA cost/benefit optimization by performing and documenting radiological analyses
35. Provide nuclear reactor physics analysis to include but not limited to LWR production of tritium, Pu disposition reactors, triple play reactors, heavy water reactors, and gas cooled reactors
36. Provide nuclear physics applications and analyses related to accelerator production of tritium
37. Perform and document radionuclide depletion and decay analysis for nuclear fuel
38. Perform and document radiation shielding and criticality analyses for packaging and transportation safety analysis reports (SARPs)
39. Develop and maintain all authorization basis documents (e.g., Safety Analysis Reports, Basis for Interim Operation, Justification for Continued Operation, Technical Safety Requirements, Administrative Limits, Process Requirements, Health and Safety Plans, Auditable Safety Analysis).
40. Maintain the SRS Generic Safety Analysis Report
41. Develop EPA Risk Management Plans (RMPs)
42. Provide DOE-HQ technical support as requested in the safety documentation, safety analysis and criticality safety areas
43. Perform functional classification and issue the functional classification report document for Design Authority approval
44. Perform and document human reliability analyses
45. Perform and document instrumentation setpoint and uncertainty analysis
46. Develop and maintain the Authorization Basis parameters linking database
47. Maintain the following Databases:
  - Tritium Fault Tree Database
  - Technical Area Fault Tree Databank
  - 200-Area (Separations Facility) Fault Tree Databank
  - 300-Area (Materials) Fault Tree Databank
  - Waste Management Fault Tree Databank
  - REAC Database
48. Perform and document human factors evaluations, including man-machine interfaces, operator interactions, task analyses, worker environment, and organizational capabilities
49. Manage implementation of the Potential Inadequacy in Safety Analysis (PISA) and New Information (NI) processes at the facilities

50. Develop and document safety functional requirements for existing, proposed and new facilities
51. Provide Regulatory Programs Support to Operating Divisions
52. Develop and maintain the list of Authorization Basis Documents for the existing, proposed and new facilities
53. Develop the Authorization Basis Commitment Matrix for the existing, proposed and new facilities
54. Fulfill Division Coordinator responsibilities for the implementation of the Lessons Learned Program for existing, proposed and new facilities

### 3.6.2 Affiliate Exclusive Support Services

The Affiliate shall provide support for the following activities when they are not performed by the relevant Operating Division:

1. Safety support to the facilities for the implementation of the SIRIM process
2. Assist in performing and documenting safeguards and security vulnerability assessment, radiological and toxicological sabotage analyses
3. Perform and document radiological shielding analysis
4. Perform and document radiation shielding analyses for processes and equipment
5. Perform and document equipment reliability analyses (RAMI – reliability, accessibility, maintainability, inspectability)
6. Perform fire safety analysis
7. Perform failure modes analysis
8. Design, implement, and maintain event databanks and equipment and human reliability databanks
9. Maintain and provide interpretation of Safety Management System Descriptions (Draft)
10. Field testing related to safety
11. D & D Rollback
12. Support & Maintenance of the 11Q Manual and Policies 1.22 & 4.5 of the 1-01 Manual, “Integrated Standards Based Safety Management Program” and “Nuclear Safety”

### 3.6.3 Affiliate Support Services

The Affiliate shall provide support, as requested, for the following activities:

1. Root Cause Analysis
2. Cost-benefit analysis
3. Fire hazard analysis

4. Operational improvement studies and assessments
5. Alarm minimization evaluation and analysis
6. Tasks related to safety management within the competencies of the Affiliate such as design basis documentation, engineering evaluations, operations analysis and conduct of operations, engineering and maintenance consultation

#### **4.0 ACCEPTANCE OF SERVICES**

##### **4.1 Final Acceptance Method**

See Article X of the Interworks Requisition for the method to execute and accept work.

#### **5.0 ATTACHMENTS**

##### **5.1 Attachment 1 – Supplier Quality Assurance Program Requirements**