

We put science to work.™

# TechBriefs

## Savannah River National Laboratory

U.S. DEPARTMENT OF ENERGY • SAVANNAH RIVER SITE • AIKEN • SC

[srnl.doe.gov](http://srnl.doe.gov)

### At a glance

- > Automates guideline selection
- > Uses a graded approach
- > Increases efficiency and consistency of analysis
- > Enables multiple users to perform simultaneous analyses
- > Tracks status of analyses
- > Copyrighted

### Contact Information

#### Partnering Opportunities

Savannah River National Laboratory  
E-mail: [partnerships@srnl.doe.gov](mailto:partnerships@srnl.doe.gov)



## Human Factors Engineering Analysis Tool

A new software tool enables the easy and quick selection of applicable regulatory guidelines as a starting point for human factors engineering (HFE) analyses. Once selected, each guideline can be viewed on screen. The software tracks and reports the status of HFE analyses and may be accessed simultaneously by multiple users.

### Background

One of the human factors engineering standards used in the design of human-system interfaces for process control systems at the Savannah River Site is NUREG 0700, “Human-System Interface Design Review Guidelines,” issued by the Nuclear Regulatory Commission (NRC). NUREG 0700 includes over 1,650 distinct guidelines. NRC provides a software tool, the Design Review Guide, to assist in the NUREG 0700 guideline analysis process. However, the burden for selecting which of the 1,650 guidelines are applicable to a given process is placed on the user. Manual selection of appropriate guidelines can be tedious. It also can lead to inconsistencies among analyses due to different user preferences or interpretations.

### Guidelines are presorted by applicability

In developing the Human Factors Engineering Analysis Tool (HFE-AT), a team of HFE subject matter experts reviewed and categorized all 1,650+ NUREG 0700 guidelines.

The guidelines were sorted into the following categories:

- System technical applicability (computer based or non-computer based)
- System functional applicability (safety basis or non-safety basis)

The guidelines also were sorted by the following types:

- General concept: highest level or most general description of a topic that is common to two or more guidelines
- Supporting detail: guidelines that address specific details associated with general concepts
- Stand-alone: any other guideline that is sufficiently important to be considered individually

### Graded approach used to select guidelines

The selection of type is dependent on the selection of category. For example, supporting detail guidelines will only be selected for safety basis analyses. This system default mode can,



# TechBriefs

## Savannah River National Laboratory

### Technology transfer

The Savannah River National Laboratory (SRNL) is the U.S. Department of Energy's (DOE) applied research and development laboratory at the Savannah River Site (SRS).

With its wide spectrum and expertise in areas such as homeland security, hydrogen technology, materials, sensors, and environmental science, SRNL's cutting edge technology delivers high dividends to its customers.

The management and operating contractor for SRNL is Battelle Savannah River Alliance, LLC. BSRA is responsible for transferring its technologies to the private sector so that these technologies may have the collateral benefit of enhancing U.S. economic competitiveness.

however, be overridden by the user who may view and select specific supporting details for non-safety basis analyses.

The user also can enter specific user-defined guidelines in addition to the preloaded guidelines.

As an example of its inherent efficiency, the FHE-AT software consistently selects only 620 of the NUREG 0700 guidelines as a starting point for typical analyses involving computer-based, non-safety basis process control systems.

### Partnering opportunities

SRNL invites interested companies with proven capabilities in this area of expertise to enter into a licensing agreement with SRNL to market this nuclear material detection system. Interested companies will be requested to submit a business plan setting forth company qualifications, strategies, activities, and milestones for commercializing this invention.

Qualifications should include past experience at bringing similar products to market, reasonable schedule for product launch, sufficient manufacturing capacity, established distribution networks, and evidence of sufficient financial resources for product development and launch.

SRNL-L5200-2011-00003