SAVANNAH RIVER SITE
CITIZENS ADVISORY BOARD

P.O. Box A ◇ Building 730-B, Room 1184 ◇ Aiken, SC 29802

A Department of Energy Environmental Management Site-Specific Advisory Board

October 7, 2010

Mr. Jack Craig, Acting Manager
U.S. Department of Energy
Savannah River Operations Office
P. O. Box A
Aiken, SC 29808

Dear Mr. Craig,

On behalf of the SRS Citizens Advisory Board, I am pleased to forward to you the following recommendation adopted at our September 28, 2010 Board meeting:

Recommendation #273 - Preservation of Shield Doors to Support Nuclear Non-Proliferation Programs and Other Scientific Programs at SRS and DOE-wide

We anticipate a written response to these recommendations prior to our next Board meeting on November 16, 2010.

Our appreciation to you and your staff for the support, information, and briefings provided that assisted us in the development of this recommendation.

Sincerely,

Manuel Bettencourt, Chairperson
SRS Citizens Advisory Board

Enclosure:
Recommendation #273

cc w/enclosures:
Melissa Nielson, EM-13, DOE-HQ
Catherine Brennan, EM-13, DOE-HQ
Sandra Johnson, Office of the Manager, DOE-SR
Rebecca Craft, Office of External Affairs, DOE-SR
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Franklin Hill, EPA
Albert Frazier, GADNR

The CAB's purpose is to provide advice and recommendations on environmental restoration, waste management, and related activities to DOE.

If you have questions or comments, please contact us at:
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For more information about the CAB, visit us at **www.srs.gov/general/outreach/srs-cab/srs-cab.html**

Preservation of Shield Doors to Support Nuclear Non-Proliferation Programs and Other Scientific Programs at SRS and DOE- wide

Background

The CAB is supportive of measures that promote the constructive use of any materials that become excess to the Site as a result of the Site facility disposition and cleanup activities. It is our understanding that massive steel doors once a part of the production reactors may offer such an opportunity. We offer the following comments for your consideration.

The steel doors mentioned above may represent a unique opportunity to preserve a potential national resource. We submit that the nature of this steel may make it uniquely suited for certain scientific applications.

We feel that any materials available in substantial quantities such as steel should be assessed for use on the Site and/or evaluated for off-site sale. It seems that some cost savings could be realized from the proper reuse of this material.

There are many nuclear detection programs nationwide, and perhaps worldwide, that involve a need for ultra low-level background radiation counting. One essential ingredient in such programs is shielding material free of radiation. To be effective, the device/counter must be surrounded by an immense shield that blocks any undesired radiation. A key element of the detector is that the shield must be extremely clean of radioactive material contaminants that interfere with the operation of the detector. One such material available is the "battleship" steel from the Production Reactor process room shield doors at SRS. This material is unique since it was made from iron ore and other components prior to the nuclear weapons atmospheric testing of the late 1940s and the 1950s, the use of nuclear weapons in WWII, and Chernobyl event fallout. Steel made subsequent to atmospheric testing and these other events is contaminated with fallout and may be unsuitable for shielding in such facilities.

One such facility exists at SRNL that has under ground counting equipment to detect nuclear explosions that occur in other areas of the world. The device detects/counts extremely low level radiation emitted from a detonated nuclear explosion.
Current commercial steel contains radioactive impurities that were introduced into the air/environment as a result of above ground nuclear weapons testing, Chernobyl, and the bombing of Japan at the end of World War II. Steels containing these fallout impurities may not be suitable for use in low level counting devices. The steel used in the current SRS nuclear non-proliferation detector was not easily obtained. The steel shield material came primarily from a pre World War II aircraft carrier. Additional steel was obtained from an iron ore mine near Birmingham, AL. To ensure radioactive cleanliness of the steel, the ore was protected from the environment, especially rain water, while being transported via rail from the ore pit to the steel mill.

The P and R reactors (and likely the other reactors, L, K and C) are currently scheduled for decommissioning. It is understood that the current Savannah River Recovery Act Program plan is not to preserve the shield doors. The steel in these massive doors may be an extremely valuable asset. It is understood that another ultra low level detector is planned for SRS. It is conceivable that the shield doors from the P & R reactors could be used for the next generation of nuclear non-proliferation ultra low level counting devices at SRS, at another DOE Lab, or other specialty scientific applications.

Recommendation:
The Savannah River Site Citizens Advisory Board (SRS CAB) recommends the following:

1) Determine the pedigree of the P& R reactor shield door steels to assess if the radioactive background level of the steel is low enough to be considered for such uses as the ultra low counting devices to support the Nuclear Non-Proliferation programs at SRS.
2) Evaluate the cost effective use of the steel at SRS and inform other potential users (DOE/NNSA/DoD).
3) If the steel has the desired pedigree, it is recommended that the shield doors be removed from the P & R reactors, transported and stored in a suitable location.