UNITED STATES
NUCLEAR REGULATORY COMMISSION
OFFICE OF NUCLEAR REACTOR REGULATION
WASHINGTON, D.C. 20555

July 10, 1987

NRC INFORMATION NOTICE NO. 87-32: DEFICIENCIES IN THE TESTING OF NUCLEAR-GRADE ACTIVATED CHARCOAL

Addressees:

All nuclear power reactor facilities holding an operating license or a construction permit.

Purpose:

This information notice is provided to call attention to deficiencies found in the testing of nuclear-grade activated charcoal used for accident mitigation in nuclear facilities. It is expected that recipients will review the information for applicability to their facilities and consider action, if appropriate, to preclude a similar problem at their facilities. However, suggestions contained in this information notice do not constitute NRC requirements; therefore, no specific action or written response is required.

Background:

The ASME Committee on Nuclear Air and Gas Treatment (CONAGT) first identified a problem with testing nuclear-grade activated charcoal when the committee conducted an interlaboratory comparison and found that seven U.S. and eight foreign testing companies obtained vastly differing results from testing samples of the same charcoal. After efforts to resolve the differences failed, the NRC contracted with the Idaho National Engineering Laboratory (EG&G) to investigate the problem. The contractor has conducted independent laboratory studies and has worked with the testing companies to identify the principal problems. Serious problems were found with the capabilities of the testing companies and with the testing standard (ASTM Standard D-3803-1979, "Standard Methods for Radioiodine Testing of Nuclear-Grade Gas-Phase Adsorbents"). Specific suggestions were made to improve the capabilities of the testing companies; a new testing protocol was developed to correct shortcomings found in the standard; and a final interlaboratory comparison was conducted.

The results, which were received in November 1986, indicate a substantial improvement over the original CONAGT results, but some companies still did not report acceptably accurate results. The contractor's technical evaluation report, EGG-CS-7653, "Final Technical Evaluation Report for the NRC/INEL Activated Carbon Testing Program," has been published and has been placed in the NRC Public Document Room.

Discussion

Engineered safety features, including charcoal, are provided at nuclear power plants to protect employees and the public from accidentally released radioactive materials. It has been recognized that only certain charcoals would meet the special needs of nuclear plants (see NUREG/CR-3990, "Charcoal Performance Under Accident Conditions"). ASTM Standard D-3803-1979 was developed to specify the requirements for testing charcoal and was accepted by the NRC (Regulatory Guide 1.52, 1979). The NRC investigation, which followed the CONAGT interlaboratory comparison, identified serious shortcomings in the standard and found that it had never been verified. The standard is currently being revised. However, until it is available the protocol developed by EG&G is one possibility for consideration by testing companies.

Although shortcomings in testing capabilities were identified by EG&G, deficiencies can be corrected only by the individual companies. The failure to upgrade equipment so the test parameters can be adequately controlled is the principal reason for the unacceptable results in the recent tests.

Additional information on test accuracies and changes made to improve the accuracy of test results may be sought by direct contact with the individual testing companies.

No specific action or written response is required by this information notice. If you have any questions about this matter, please contact the Regional Administrator of the appropriate regional office or this office.

Charles E. Rossi

Charles E. Rossi, Director
Division of Operational Events Assessment
Office of Nuclear Reactor Regulation

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(301) 492-9416

Attachment: List of Recently Issued NRC Information Notices

Attachment 1
IN 87-32
July 10, 1987

LIST OF RECENTLY ISSUED
INFORMATION NOTICES 1987

Information Notice No.	Subject	Date of Issuance	Issued to
87-31	Blocking, Bracing, and Securing of Radioactive Materials Packages in Transportation.	7/10/87	All NRC licensees.
87-30	Cracking of Surge Ring Brackets in Large General Electric Company Electric Motors	7/2/87	All nuclear power reactor facilities holding an OL or CP.
87-29	Recent Safety-Related Incidents at Large Irradiators.	6/26/87	All NRC licensees authorized to possess and use sealed sources in large irradiators.
87-28	Air Systems Problems at U.S. Light Water Reactors	6/22/87	All nuclear power reactor facilities holding an OL or CP.
87-27	Iranian Official Implies Vague Threat to U.S. Resources	6/10/87	All nuclear power reactor facilities holding an OL or CP, research and nonpower reactor facilities, and fuel fabrication and processing facilities using or possessing formula quantities of special nuclear material.
87-26	Cracks In Stiffening Rings on 48-Inch Diameter UF_6 Cylinders.	6/11/87	All uranium fuel fabrication and conversion facilities.
87-25	Potentially Significant Problems Resulting from Human Error Involving Wrong Unit, Wrong Train, or Wrong Component Events.	6/11/87	All nuclear power reactor facilities holding an OL or CP.
87-24	Operational Experience Involving Losses of Electrical Inverters.	6/4/87	All nuclear power reactor facilities holding an OL or CP.

OL = Operating License
CP = Construction Permit

Discussion

Engineered safety features, including charcoal, are provided at nuclear power plants to protect employees and the public from accidentally released radioactive materials. It has been recognized that only certain charcoals would meet the special needs of nuclear plants (see NUREG/CR-3990, "Charcoal Performance Under Accident Conditions"). ASTM Standard D-3803-1979 was developed to specify the requirements for testing charcoal and was accepted by the NRC (Regulatory Guide 1.52, 1979). The NRC investigation, which followed the CONAGT interlaboratory comparison, identified serious shortcomings in the standard and found that it had never been verified. The standard is currently being revised. However, until it is available the protocol developed by EG&G is one possibility for consideration by testing companies.

Although shortcomings in testing capabilities were identified by EG&G, deficiencies can be corrected only by the individual companies. The failure to upgrade equipment so the test parameters can be adequately controlled is the principal reason for the unacceptable results in the recent tests.

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E

*SEE PREVIOUS CONCURRENCES

D/DOEA:NRR	*C/OGCB:DOEA:NRR	*PPMB:ARM	*SAD:DEST:NRR	*AC/SPLB:DEST:NRR
CERossi	CHBerlinger	TechEd	AThadani	JWCraig
07/7/87	07/1/87	06/26/87	06/30/87	06/26/87
*OGCB:DOEA:NRR	*PRPB:DREP:NRR	*C/PPRB:DREP:NRR	*D/DREP:NRR	*SPLB:DEST:NRR
RJKiessel	CAWillis	LJCunningham	FCongel	CRNichols
06/25/87	06/26/87	06/26/87	06/26/87	06/26/87

Discussion

Engineered safety features, including charcoal, are provided at nuclear power plants to protect employees and the public from accidentally released radioactive materials. It has been recognized that only certain charcoals would meet the special needs of nuclear plants (see NUREG/CR-3990, "Charcoal Performance Under Accident Conditions"). ASTM Standard D-3803-1979, was developed to specify the requirements for testing charcoal, which was published and accepted by the NRC (Regulatory Guide 1.52, 1979). The NRC investigation, which followed the CONAGT interlaboratory comparison, identified serious shortcomings in the standard and found that it had never been verified. The standard is currently being revised. However, until it is available the protocol developed by EG&G is one possibility for consideration by testing companies.

Although shortcomings in testing capabilities were identified by EG&G, equipment deficiencies can be corrected only by the individual companies. The failure to upgrade equipment so the test parameters can be adequately controlled is the principal reason for the unacceptable results in the recent tests.

Additional information on test accuracies and changes made to improve the accuracy of test results may be sought by direct contact with the individual testing companies.

No specific action or written response is required by this information notice. If you have any questions about this matter, please contact the Regional Administrator of the appropriate regional office or this office.

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Discussion

Engineered safety features, including charcoal, are a part of the licensing bases (Final Safety Analysis Report and Technical Specifications) for nuclear power plants. It has also been recognized that only certain charcoals would meet the special needs of nuclear plants (for example, see NUREG/CR-3990, "Charcoal Performance Under Accident Conditions"). ASTM Standard D-3803-1979, was developed to specify the requirements for testing charcoal. The standard was developed, published and accepted by the NRC (Regulatory Guide 1.52, in 1979). The NRC investigation which followed the CONAGT interlaboratory comparison identified serious shortcomings in the standard, found that it had never been verified and showed that it was not being rigorously followed. The standard is currently being revised. However, until it is available the protocol developed by EG&G could be used by testing companies.

Shortcomings in testing capabilities were identified by EG&G but equipment deficiencies can be corrected only by the individual companies. One company that made the improvements reported the cost to be more than $70,000. The cost could be higher for some other companies. It is believed that the failure to upgrade equipment so the test parameters could be adequately controlled is the principal reason for the unacceptable results in the recent tests.

Additional information on test accuracies and changes made to improve the accuracy of test results may be sought by direct contact with the individual testing companies.

Licensees are responsible for maintenance of their filtration systems and should review the above information to ensure that the quality of accident mitigating systems are maintained.

No specific action or written response is required by this information notice. If you have any questions about this matter, please contact the Regional Administrator of the appropriate regional office or this office.

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