A. James Clark
School of Engineering
Materials Science & Engineering Program

50-166

United States Nuclear Regulatory Commission
One White Flint North MS 12G13
11555 Rockville Pike
Rockville, Maryland 20852-2738
ATTN: Marcus Voth

April 25, 2006

Enclosed please find the University of Maryland's response to the request for additional information as it pertains to section two of the Safety Analysis Report for the Maryland University Training Reactor.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on April 25, 2006

[Signature] Mohamad Al-Sheikhly, Director
University of Maryland Training Reactor
License Number R-70, Docket number 50-166

A020

Safety Analysis Report (SAR)

2.0 SITE CHARACTERISTICS

1. Section 2, Site Characteristics. Have significant changes described in Section 2.0 of the MUTR SAR (such as the peak daytime population increase from 20,000 to 45,000) been evaluated against the existing design and analyses to see whether they have any impact? Do these changes have any effect on the design and analyses presented in other chapters of the SAR, e.g., Chapter 3, "Design of Structures, Systems, and Components"; Chapter 11, "Radiation Protection Program and Waste Management"; and Chapter 13, "Accident Analyses"?

Response:

Although the peak daytime population has increased by a factor of two, the buildings adjacent to the MUTR have experienced a reduction in population. The area bound by Paint Branch drive and the MUTR has been converted from an area of portable classrooms to a parking lot. The College Park Fire Department has relocated to a location on US Route 1 which reduces response time by a factor of two. With the additional reduction of occupants to the Chemical and Nuclear Engineering building by conversion of classroom areas to meeting and conference areas, the average daytime population in the vicinity has dropped. Therefore there is no significant impact to the operation and safety to the MUTR.

2. Section 2.2.2, Air Traffic, page 2-7. Some discussion is provided regarding the nearby small, single runway airport that is approximately 1.5 km from the MUTR, the types of planes that use the airport, and the relatively minor damage that would be expected if a small aircraft was to strike the MUTR. Discuss why this type of impact would not cause any significant damage to the pool tank and fuel.

Response:

The College Park Airport is a single runway airport located at 1919 Corporal Frank Scott Drive in College Park. It has a runway of 2610 feet in length and 60 feet in width. The planes using this airport are limited to a maximum gross weight of 8500 pounds. Airport operations are conducted from 7:00 am through 10:00 pm. The aircraft using this airport are vintage planes over 25 years old. Since the heightened security awareness of 1991, no transient aircraft are permitted to utilize the strip. The only allowable users of the airport are aircraft based in College Park and must file a flight plan with the FAA before both leaving and returning to College Park. All users of the airport must pass a federal background investigation before being allowed to either depart or land at the site. The standard flight path out of College Park does not cross the reactor boundary and presents minimal potential hazard to the MUTR site. In the event of an incursion of one of these small airplanes into the facility, damage could be expected to the confinement but not to the fuel or vessel due to the construction of the vessel which is described in depth in the facility documentation.

3. Section 2.3.1, Meteorology - General and Local Climate, page 2-8. This section of the SAR should be updated to describe the recent tornado that hit this area in 2001 and to discuss the frequency and consequences of such a tornado on the MUTR.

Response:

The following statement has been added to the SAR:

The latest to be documented occurred on the afternoon of September 24, 2001, this tornado touched down two miles southwest of College Park and rapidly intensified to F3 strength. When it moved through the University of Maryland in College Park, it damaged buildings and destroyed ten trailers. The trailers were the temporary offices of the Maryland Fire and Rescue Institute. The northwest corner of the campus, near Byrd Stadium, received the worst damage. In all, twelve buildings at the University were damaged and approximately 300 cars were either damaged or destroyed.

A car containing two university students was lifted off the ground and carried over an eight-story dorm building. The car fell into the woods across University Boulevard, killing both students.

The storm struck particularly hard near the corner of University Boulevard and Metzerott Road, where a church steeple was displaced and the building also sustained substantial structural damage. An adjacent apartment complex also had its roofs sheered off. Near the University of Maryland Golf Course, the indoor tennis facility was completely destroyed.

The tornado moved through the north side of College Park and then through Beltsville, tracking between Interstate 95 and Route 1. It was sustained at F2 strength, with maximum winds up to 150 mph. It felled thousands of trees and numerous power lines. The College Park Marketplace shopping center took a direct hit. In addition, the roof of the St. Joseph's School in Beltsville was blown off into an adjacent building.

As the tornado towards Laurel, it briefly intensified to F3 strength. Approximately 150-175 homes and businesses were damaged. In all, the tornado damaged or destroyed over 800 houses, 500 cars and 20 businesses along its 17.5-mile wide path through Prince George's and Howard Counties. There were two deaths and over 50 injuries. Damages exceeded $50 million. The reactor building and associated laboratories were subjected to no damage.

4. Section 2.5.4, Vibratory Ground Motion, page 2-12. The magnitude of vibratory ground motion is presented in Section 2.5.4 of the MUTR SAR based on 1999 US Geological Survey (USGS) estimates. The value of 18% g at 0.5 second period in the SAR does not appear to match the information from the USGS (18% g at 0.2 second period).
Please explain this difference and indicate whether the specified maximum earthquake potential/vibratory ground motion have been considered in the design or the basis for acceptance of these values.

Response:

The value listed at 0.5 second is a typographical error. It shall be amended to read 0.2 second. The evaluation was conducted using the proper information.

5. Sections 2.0 and 3.0. These sections of the MUTR SAR contain statements which present staff conclusions such as "...the staff concludes that the meteorological conditions at the reactor site neither pose a significant risk of damage to the reactor nor render the site unacceptable for the facility." Please replace these statements with an analysis and basis of why you find the sections under discussion to be acceptable.

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April 25, 2006

Enclosed please find the University of Maryland's response to the request for additional information as it pertains to section three of the Safety Analysis Report for the Maryland University Training Reactor.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on April 25, 2006

[Signature] Mohamad Al-Sheikhly, Director
University of Maryland Training Reactor
License Number R-70, Docket number 50-166

3.0 DESIGN OF STRUCTURES, SYSTEMS, AND COMPONENTS

6. Section 3.1, Design Criteria, page 3-1. This section of the MUTR SAR indicates that the reactor building was designed and built to meet or exceed building codes existing at the time of construction. Please provide a summary of the codes, standards, and guides that were followed for structures, systems, and components that are required to ensure reactor facility safety and protection of the public.

Response:

All applicable codes were followed during both the original construction and during modifications or updates performed on both the facility and the Chemical and Nuclear Engineering building. The official state-wide law confirms to the Building Officials and Code Administrators International (BOCA) code. All subsequent building upgrades conform to the most recent BOCA modifications in effect at the time of construction.

7. Section 3.5, Systems and Components. This section does not provide the design bases for electro-mechanical systems and components that are required to function. Please provide a summary of the design criteria (codes/standards, loadings, operating environment, etc.).

Response:

All applicable codes were followed during both the original construction and during modifications or updates performed on both the facility and the Chemical and Nuclear Engineering building. The official state-wide law confirms to the Building Officials and Code Administrators International (BOCA) code. All subsequent building upgrades conform to the most recent BOCA modifications in effect at the time of construction. Required systems which include the mechanical systems important to safety are the neutron-absorbing control rods suspended from the reactor superstructure. The motors, gearboxes, electromagnets, switches, and wiring are all above the level of the water and readily accessible for visual inspection, testing, and maintenance. The control rods are inserted by gravity feed in the case of power failure that may prevent insertion by the CRDMs. The control rod drop time is administratively limited to a maximum of one second and is a surveillance item as is the visual inspection of the control rods. The operating environment of all components are within the constraints as predicted by the manufacturers.