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November 27, 2007

US Nuclear Regulatory Commission
Mr. John T. Nguyen
Mail Stop: O12-G15
Washington, D.C. 20555-0001

Subject: Response to request for additional information regarding the University of Missouri-Rolla Reactor Facility, November 27, 2007. License R-79, Docket no. 50-123.

Mr. John Nguyen:

The attachment with this letter addresses the following request for additional information questions: 1, 3, 4, 5, 9, 11, 13, 16, 17, 18, 19, 20, 21, 22, and 33.

Questions 3 and 4 are answered with the same response and are numbered 3/4. Questions 20 and 21 are answered together and are numbered 20/21.

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

William Bonzer
Executed on November 27, 2007

Sincerely,

William Bonzer

William Bonzer
UMRR Manager

Cc: Peter Kohut

Enclosure: Response to Request for Additional Information University of Missouri-Rolla Reactor Facility License R-79, Docket No. 50-123, November 27, 2007

Response to Request for Additional Information
University of Missouri-Rolla Reactor Facility
License R-79, Docket No. 50-123
November 27, 2007

1. Fort Leonard Wood is a distance of 40 kilometers from UMRR.

The Army Reserve Center, located in Rolla, conducts all field activities outside of the Rolla area and at least 8 kilometers from UMRR.

3/4. Recent wind speed data was obtained from Mr. John Senne, who collects weather data for the National Weather Service in Springfield Missouri. Mr. Senne's data collection site is about five miles northwest of Rolla and nine miles southwest of the Vichy Station.

The first table lists the monthly wind speed and direction. The second table lists the highest wind speed for the month.

Rolla, Missouri - Monthly Average Wind Speeds (mph) and Dominant Direction

	2000		**2001**		**2002**		**2003**		**2004**		**2005**	
January	2.2	S	2.0	SW	2.6	SW	2.7	SW	2.4	NNE	1.5	S
February	3.0	S	2.2	S	3.0	S	2.3	N	2.5	N	1.2	SW
March	2.0	S	1.4	N	2.9	S	2.8	S	3.1	S	1.3	N
April	2.2	S	2.8	S	2.8	S	3.1	S	2.3	S	1.2	S
May	1.1	SW	0.7	SW	1.2	SW	1.0	SSW	0.8	SW	0.2	SW
June	0.8	SW	0.6	SW	0.6	SW	0.6	SW	0.3	SW	0.2	SW
July	0.5	SW	0.5	SW	0.6	SW	0.8	SW	0.3	SW	0.1	SW
August	0.6	SW	0.5	SW	0.8	SSW	0.7	ENE	0.3	SW	0.1	ENE
September	0.6	SW	0.5	E	0.8	ENE	0.7	SW	0.2	ENE	0.1	ENE
October	0.8	SW	0.4	SW	0.8	ENE	1.2	SW	0.7	SW	0.1	SSW
November	1.5	SW	0.0	NE	2.1	SW	2.5	S	1.2	S	1.4	SW
December	1.5	NW	2.2	S	2.9	SSW	2.5	SE	1.8	S	1.0	SW
Average	**1.4**	**NW**	**1.1**	**SW**	**1.8**	**SW**	**1.7**	**SW**	**1.3**	**SW**	**0.7**	**SW**

Rolla, Missouri - Monthly High Wind Speeds (mph)

	2000	2001	2002	2003	2004	2005
January	29.0	25.0	20.2	22.0	26.0	22.0
February	23.0	36.0	23.0	21.0	30.0	26.0
March	36.0	31.0	26.0	28.0	28.0	32.0
April	35.0	35.0	22.0	29.0	23.0	21.0
May	15.0	18.0	33.0	21.0	14.0	16.0
June	22.0	15.0	14.0	20.0	12.0	17.0
July	16.0	14.0	19.0	18.0	18.0	12.0
August	14.0	13.0	13.0	18.0	11.0	14.0
September	14.0	15.0	13.0	15.0	12.0	18.0
October	16.0	25.0	17.0	15.0	21.0	11.0
November	18.0	8.0	20.0	21.0	20.0	28.0
December	21.0	28.0	28.0	22.0	21.0	18.0

5. From January 1, 1993 through March 31, 2007 seven tornadoes were recorded in Phelps County by the National Climatic Data Center. Three tornadoes were rated F0, two F1, one F2, and one F3.

   The reactor building consists of an I-beam structure for the walls and ceiling. The I-beams have additional angular bracing bars to maintain the integrity of the structure. The reactor building structure is routinely monitored by the reactor staff through observance of the I-beam structure while working in the building.

9. The Void Coefficient of Reactivity values listed in Section 4.2 Table 4.1 and Section 4.5.2.2 have typographical errors. The values should be listed as $\approx -9.0\times10^{-7}\Delta k/k/cm^3$. UMRR proposes to make the following changes:
   - Remove $\approx -9.0\times10^{-7}\ \Delta k/k/°C$ from Table 4.1 in Section 4.2 and replace it with $\approx -9.0\times10^{-7}\Delta k/k/cm^3$
   - Remove 9E+7 Δk/k/cm3 from Section 4.5.2.2 and replace it with $\approx -9.0\times10^{-7}\Delta k/k/cm^3$

11. Technical Specification 14.3.1(4) states "The reactor shall be operated only when all lattice positions internal to the active fuel boundary are occupied by either a fuel element, control rod fuel element, or by an experimental facility." This prevents misloading a fuel element internal to the core that would create an undesired amount of excess reactivity.

    UMRR Standard Operating Procedures address loading fuel at the periphery of the core. Approval by the Reactor Manager is required to move fuel elements. Supervision of each fuel element movement is performed by a Senior Reactor Operator. An approach to criticality procedure is used for each fuel element added to the core. This procedure lowers the risk of overloading the core by predicating how many fuel elements are needed to take the core critical. Approach to criticality plots are charted for each fuel element added to the core with control rods at shim range (about half withdrawn from the core) and fully with drawn from the core. The fully withdrawn criticality plot is performed only if the core is subcritical. As the core approaches criticality a half fuel element is added in place of a full fuel element. Once criticality is obtained excess reactivity and shutdown margin are determined. To further increase excess reactivity of the core, fuel elements are added to the core in half fuel element increments by adding a half fuel element or by replacing a half fuel element in the core with a full fuel element.

13. The Shim/Safety Rod and Regulating Rod drives speeds are checked randomly to verify their speeds have not changed. The drive speeds have been consistent over the years due to the structure of the rod drive mechanisms. A single speed 60 hertz alternating current motor is used to power a mechanical actuator for each of the rod drives.

16. UMRR building evacuation drills usually take about three minutes to perform. If an emergency situation arose requiring a building evacuation the following timeline may exist:

½ minute	The Reactor Operator sounds the building evacuation alarm, scrams the reactor, verifies control rods are inserting, secures the magnet key, and announces the facility status.
½ minute	The Reactor Operator waits for the SRO on Duty to arrive at the control room.
1 minute	The Reactor Operator reports the status of the emergency to the SRO on Duty.
2-3 minutes	The SRO on Duty verifies all personnel have left the reactor building.
½ minute	The SRO on Duty verifies vent fans are turned off and leaves the building.

Additional time may be required to mitigate an emergency situation depending on the nature of the emergency. If the emergency situation can be left without further action needed by reactor staff, the reactor staff will evacuate the reactor building and develop recovery plans at the emergency rendezvous area.

17. All fuel elements are stored in the reactor pool and not removed from the pool. Fuel elements not loaded in the core are in a fuel storage pit at the end of the pool. A procedure would have to be written and approved by the UMR Radiation Safety Committee prior to removal of a fuel element from the reactor pool.

18. Section 11.1.2 states "Periodic grab samples are used to monitor for Ar-41 in the containment air." This statement should read confinement air not containment air. UMRR proposes to change the word containment to confinement in Section 11.1.2.

19. UMRR proposes to replace the definition of reactor secured as listed in Section 14.1.2 with the ANS-15.1 definition of reactor secured. The definition of reactor secured listed in Section 14.1.2 is the following:

reactor secured - whenever (1) all shim/safety rods are fully inserted, (2) the console key is in the OFF position and is removed from the lock, (3) no experiments worth more than 0.4% $\Delta k/k$ are near the core, and (4) no in-core work is in progress involving fuel, and maintenance of the core structure, control rods, or control rod drive mechanisms.

The proposed revision to the Technical Specifications for the definition of reactor secured in Section 14.1.2 is the following:

reactor secured - whenever
(1) Either there is insufficient moderator available in the reactor to attain criticality or there is insufficient fissile material present in the reactor to attain criticality under optimum available conditions of moderation and reflection, or
(2) The following conditions exist:

a. The minimum number of neutron absorbing control devices are fully inserted or other safety devices are in shutdown position, as required by technical specifications, and
b. The console key switch is in the off position and the key is removed from the lock, and
c. No work is in progress involving core fuel, core structure, installed control rods, or control rod drives unless they are physically decoupled from the control rods, and
d. No experiments are being moved or serviced that have, on movement, a reactivity worth exceeding the maximum value allowed for a single experiment, or one dollar, whichever is smaller.

20/21. Section 14.3.2.2 does refer to Safety Channel No. 1 and Safety Channel No. 2 indirectly as the Reactor Power channel. UMRR proposes to revise Technical Specification 14.3.2.2 to replace the term "Reactor Power" with the specific safety channels listed in Table 7.1.

UMRR proposes to revise Technical Specification 14.3.2.2 to include an additional safety system channel, a loss of coolant.

Technical Specification 14.3.2.2 is listed as follows:

14.3.2.2 Reactor Safety Systems

Applicability: This specification applies to the reactor safety system channels.

Objective: To stipulate the reactor safety system channels that must be operable to ensure that the limiting safety system settings are not exceeded during normal operation.

Specification: The reactor shall not be operated unless the safety system channels presented in the Table 14.2 are operable. Values listed in the table are the limiting set points. For operational convenience the actual set points may be on more restrictive values.

Table 14.2-Safety System Channels.

Channel	Set Point	Function
Manual Scram Button	Not applicable	Scram
Reactor Power	300 kW_t	Scram
Reactor Period	5 s	Scram
Bridge Motion	Not applicable	Scram
Log N & Period Not Operative	Not applicable	Scram

Bases: Power channels are provided to ensure that the power level is limited to protect against abnormally high fuel temperatures. The manual scram allows the operator to shut down the reactor if an unsafe or abnormal condition arises. The period scram is provided to ensure that the power level does not increase on a period less than 5 seconds. The bridge motion scram shuts the reactor down in the event that the bridge is moved. The Log N and Period not operative scram shuts the reactor down if the Log N and Period Channel are in a not operative condition.

UMRR proposes to revise Technical Specification 14.3.2.2 to the following:

14.3.2.2 Reactor Safety Systems

Applicability: This specification applies to the reactor safety system channels.

Objective: To stipulate the reactor safety system channels that must be operable to ensure that the limiting safety system settings are not exceeded during normal operation.

Specification: The reactor shall not be operated unless the safety system channels presented in the Table 14.2 are operable. Values listed in the table are the limiting set points. For operational convenience the actual set points may be on more restrictive values.

Table 14.2-Safety System Channels.

Channel	Set Point	Function
Manual Scram Button	Not applicable	Scram
Safety #1	300 kW_t	Scram
Safety #2	300 kW_t	Scram
Reactor Period	5 s	Scram
Bridge Motion	Not applicable	Scram
Loss of Coolant	16 ft above core	Scram
Log N & Period Not Operative	Not applicable	Scram

Bases: The manual scram allows the operator to shut down the reactor if an unsafe or abnormal condition arises. Safety channels #1 and #2 are provided to ensure that the power level is limited to protect against abnormally high fuel temperatures. The period scram is provided to ensure that the power level does not increase on a period less than 5

seconds. The bridge motion scram shuts the reactor down in the event that the bridge is moved. The loss of coolant scram shuts the reactor down in the event of a loss of pool water. The Log N and Period not operative scram shuts the reactor down if the Log N and Period Channel are in a not operative condition.

22. UMRR proposes to revise Technical Specification 14.3.6.1 Radiation Monitoring Systems by adding the Constant Air Monitor (CAM) to the specification.

The first paragraph of Technical Specification 14.3.6.1 is the following:

Specifications: The reactor shall not be operated unless the Radiation Area Monitors (RAMs) located at the reactor bridge, at the demineralizer, and in the basement experimental area are operable. Table 14.3 specifies the approximate locations, set points and functions. Values listed are the limiting set points. For operational convenience the actual set points may be on more restrictive values.

UMRR proposes to revise the first paragraph of Technical Specification 14.3.6.1 to the following:

Specifications: The reactor shall not be operated unless the Constant Air Monitor (CAM) is operable and the Radiation Area Monitors (RAMs) located at the reactor bridge, at the demineralizer, and in the basement experimental area are operable. Table 14.3 specifies the approximate RAM locations, set points and functions. Values listed are the limiting set points. For operational convenience the actual set points may be on more restrictive values.

33. UMRR proposes to modify Technical Specification 14.6.1.3 Staffing to comply with ANS-15.1 Section 6.1.3 Staffing.

Technical Specification 14.6.1.3 is listed as follows:

14.6.1.3 Staffing

1) When the reactor is operating the following staffing conditions shall be met:
   a) At least two persons, one of whom is a licensed Senior Reactor Operator, shall be present in the Reactor Building.
   b) A licensed Reactor Operator or Senior Reactor Operator shall be present in the control room.

2) All rearrangements of the core, fuel movement, and associated Health Physics monitoring, shall be supervised by a licensed Senior Operator.

UMRR proposes to modify Technical Specification 14.6.1.3 Staffing to the following:

14.6.1.3 Staffing

1) The minimum staffing when the reactor is not secured shall be:
    a. A certified reactor operator in the control room.
    b. A second designated person present at the reactor facility able to carry out prescribed written instructions. Unexpected absence for as long as two hours to accommodate a personal emergency may be acceptable provided immediate action is taken to obtain a replacement.
    c. A designated Senior Reactor Operator shall be readily available on call. "Readily Available on Call" means an individual who (1) has been specifically designated and the designation known to the operator on duty, (2) keeps the operator on duty informed of where he may be rapidly contacted and the phone number, and (3) is capable of getting to the reactor facility within a reasonable time under normal condition (e.g., 30 minutes or within a 15-mile radius).
2) A list of reactor facility personnel by name and telephone number shall be readily available in the control room for use by the operator. The list shall include:
    a. Management personnel
    b. Radiation safety personnel
    c. Other operations personnel.
3) Events requiring the presence at the reactor facility of Senior Reactor Operator:
    a. Initial startup and approach to power
    b. All fuel or control-rod relocations within the rector core region
    c. Relocation of any in-core experiment with a reactivity worth greater than one dollar
    d. Recovery from unplanned or unscheduled shutdown.