



University of Missouri-Rolla
Nuclear Reactor Facility

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June 24, 1999

Nuclear Regulatory Commission
Document Control Desk
Washington, DC 20555

Dear Sirs:

We have enclosed our Environmental Report to support the request to modify our operating license which was made in our letter to you date May 24, 1999.

Thank you for considering our request. We appreciate your handling this matter as soon as possible as it is a matter of the utmost importance.

Sincerely,

Dr. David W. Freeman
UMR Reactor Director

DWF/mk

cc: Marvin Mendonca, Project Manager
U.S. Nuclear Regulatory Commission
PDNP
M.S. 11-B-20
Washington, D.C. 20555

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Environmental Report

1.0 Proposed Action

The University of Missouri-Rolla Reactor Facility proposes to have the wording of our current operating license changed to make the license effective for a period of twenty years from the date it was issued (January 14, 1985). Therefore, if the proposed action is implemented, the current license would be effective until January 14, 2005. The current wording of the license specifies that the license expires on November 20, 1999.

There are no safety considerations dependent on the duration of operations at our facility. Because of the low licensed power (200kW) and operating history of the facility, there are no fuel burn up or material damage issues to be considered. The facility has operated less than 150 MW-hr since the last license renewal was issued.

The University of Missouri-Rolla Reactor Facility will apply for a license renewal within 30 days prior to the license expiration date. If the proposed action is denied, the license renewal application will be prepared and submitted prior to October 20, 1999. If the proposed action is approved, the license renewal application will not be due until December 14, 2004.

2.0 Background

The University of Missouri - Rolla Reactor (UMRR) is a pool reactor operating with Materials Test Reactor (MTR) - type fuel. The fuel is enriched to just less than 20 % in U-235. The maximum licensed operating power is 200 kilowatts. The UMRR is licensed by the U. S. Nuclear Regulatory Commission pursuant to 10CFR50 as a research and utilization reactor. The facility operating license number is R-79 (Docket No. 50-123).

The reactor is housed in a metal building located on the east side of the campus in Rolla, Missouri, near 14th Street and Pine Street (See Figure 1).

University of Missouri-Rolla

Thomas Jefferson Residence Hall
and addition 1 block E of HWY 63 N.

To I-44
toward
St. Louis

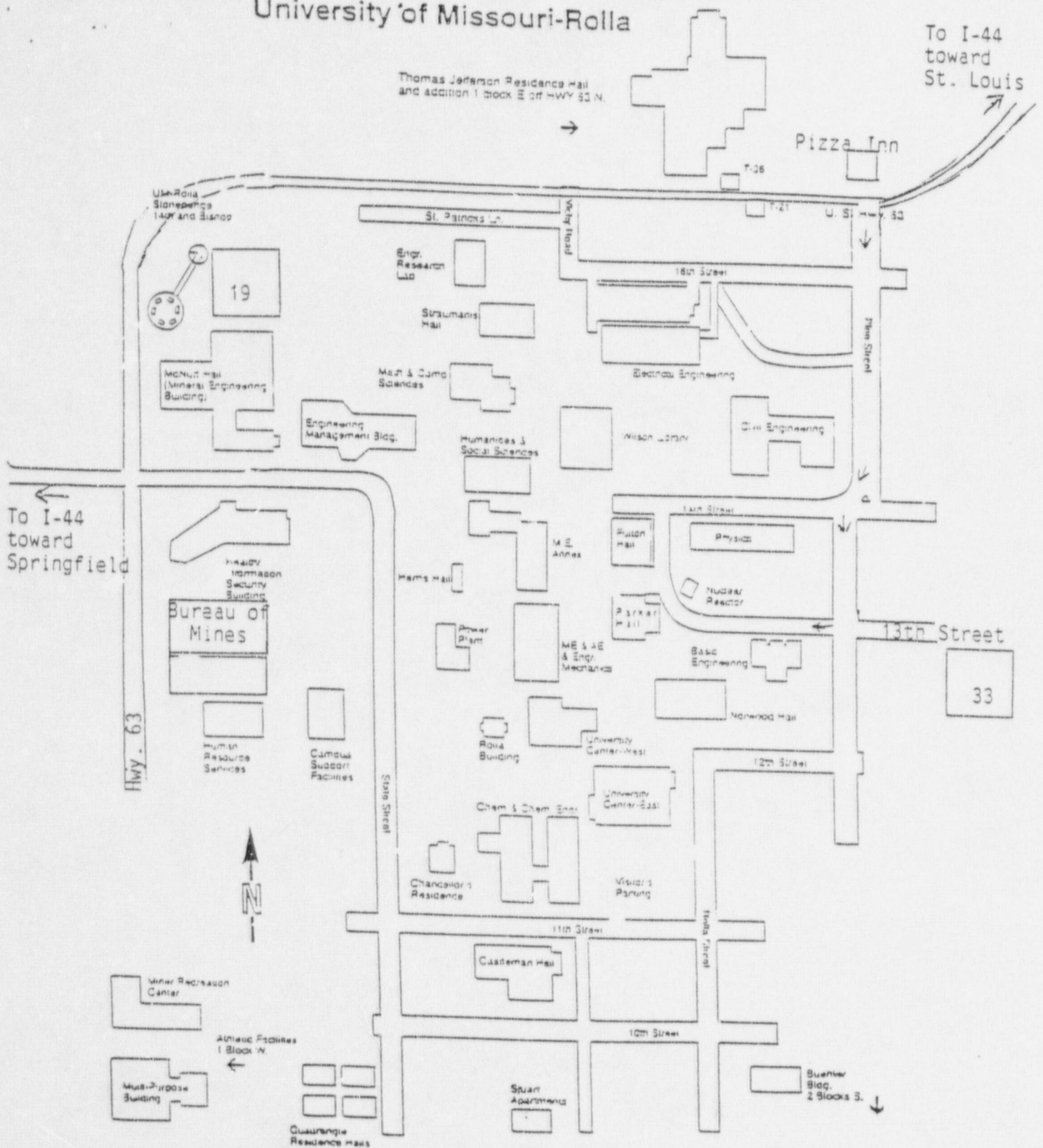


Figure 1. University of Missouri-Rolla Campus

The principle activities carried on with the reactor are instruction, training and research. Typical experimental activities include nuclear engineering education experiments and demonstrations, basic research, neutron activation analysis, student operator training, neutron radiography, prompt gamma analysis, and spectroscopy studies.

The reactor core sits near the bottom of an approximate 30,000 gallon concrete pool. The reactor is cooled by natural convection flow of pool water and thus has no secondary cooling system or cooling tower. Heat generated by the reactor is transferred to the pool and ultimately dissipated through the pool walls and into the reactor bay.

The UMR Reactor is typically operated during normal working hours. Table 1 presents the annual operating history in MW-hrs back to 1984. On average, the reactor is operated about 9 MW-hrs per year. Future operations are expected to follow the historical patterns.

Table 1. UMRR Annual Operating History	
Year	MW-hours
83-84	6.3
84-85	9.4
85-86	5.0
86-87	12.0
87-88	26.0
88-89	6.0
89-90	11.4
90-91	11.6
91-92	6.4
92-93	5.8
93-94	8.6
94-95	4.6
95-96	8.9
96-97	5.7
97-98	6.8
98-99	10.2
Average	9.0

The facility is equipped with a ventilation system that exhausts the atmosphere in the building through vent fans located on the reactor facility roof, approximately 10 meters above grade.

The only gaseous effluent associated with normal operations is Ar-41. Air contains a small amount of Ar-40. Ar-41 is produced when dissolved air in the pool water passes through the reactor core and becomes activated. In order to minimize Ar-41 production, the rabbit facilities are operated with nitrogen gas. Annual Ar-41 releases are minimal. Historical Ar-41 releases since 1984 are presented in Table 2. Information presented in Table 2 shows that the annual average Ar-41 release is only about 100 mCi. Future releases are expected to be similar to the historical releases.

Year	Activity (mCi)
83-84	6.1
84-85	19.4
85-86	46.9
86-87	205.7
87-88	404.4
88-89	63.1
89-90	119.4
90-91	171.1
91-92	138.7
92-93	38.9
93-94	60.2
94-95	60.0
95-96	46.1
96-97	31.7
97-98	135.6
98-99	77.3
Average	101.5

Liquid radioactive waste is produced by the regeneration of the demineralizer system, lowering of the pool level for maintenance, and draining of the demineralizer column in order to replace resins. The general philosophy of the facility administration has been to minimize liquid waste discharge. In recent years, the preference has been to replace resins as they become depleted rather than regenerating in order to minimize liquid waste. Liquid waste are analyzed to assure compliance with regulatory requirements and then released to the sanitary sewer system. Table 3 presents the historical annual liquid releases since 1984. Future liquid releases are expected to be minimal and are not expected to exceed the historical trends.

Table 3. UMRR Annual Liquid Releases		
Year	Activity (mCi)	Volume (Gallons)
83-84	0.198	8985
84-85	0.257	4650
85-86	0.020	3255
86-87	0.076	3255
87-88	0.332	6310
88-89	0.369	3720
89-90	0.014	500
90-91	1.411	38080
91-92	0.263	10678
92-93	0.761	11122
93-94	0.004	214
94-95	0.000	55
95-96	0.000	0
96-97	0.000	0
97-98	0.000	0
98-99	0.000	0
Average	0.232	5677

Solid radioactive waste generated during normal reactor operations typically includes ion exchange resins, pool filters, gloves, paper, and low activity samples from laboratory experiments. Solid

waste is packaged in accordance with applicable NRC and DOT regulations and is transferred to the campus Materials License and then moved to the Radiation Safety Hazardous Waste Building for future disposal in accordance with applicable regulations. Table 4 presents the historical annual solid releases since 1984. As the data in Table 4 shows, the volume and gross activities associated with solid waste is minimal. Future solid releases are not expected to be significantly different from the historical trends.

Year	Volume (ft³)	Activity (uCi)
83-84	0.0	0.0
84-85	37.5	1.0
85-86	0.0	0.0
86-87	7.5	1.0
87-88	0.0	0.0
88-89	0.0	0.0
89-90	0.0	0.0
90-91	67.5	1000.0
91-92	0.0	0.0
92-93	15.0	114.0
93-94	15.0	5.5
94-95	7.5	5.5
95-96	10.0	7.8E-03
96-97	19.3	2.9
97-98	0.0	0.0
98-99	24.0	7.7E-03
Average	12.7	70.6

3.0 Impact Of Proposed Action On Environment

There will be absolutely no impact on the environment resulting from the proposed action. The proposed action simply changes the effective expiration date of the license from November, 1999

to January, 2005.

If the proposed action is denied, a license renewal application will be made in a timely fashion and the license will go into a status of timely renewal. It is anticipated that the license will most likely be in a status of timely renewal for several years before the license is reissued. We are confident that the relicensing process will be successful and that a new license will be issued. Therefore, normal reactor operations are expected to continue during this time frame (i.e. 1999 to 2005) regardless of whether the proposed action is approved or not. Therefore, the impact on the environment will be unchanged.

The environmental impacts of normal reactor operations have been addressed above and have been shown to be insignificant.

4.0 Alternatives to the Proposed Action

The alternative to the proposed action, which simply extends the license expiration date to November 20, 2004, is to not extend the expiration date. In such an instance, the facility administration would submit a license renewal application in the Fall of 1999. As such, the reactor facility would go into "timely renewal" and the facility would continue to operate in the same mode as it has over the past many years. Therefore, the environmental impacts of the facility are identical regardless of whether or not the proposed action is implemented.

If the proposed action is denied, then an undue hardship will be imposed upon the UMRR and the NRC staff by requiring us to go through the time consuming and human resource intensive process of license renewal only 14 years after the previous license renewal. Because the license renewal process is very resource intensive, we believe that the process should not be initiated any more frequently than necessary. The proposed action seeks to establish a time period of 20 years from the date of the last license renewal as a reasonable time before reinitiating the license renewal process.

In fact, it can be argued that not granting the proposed action will adversely impact the environment

in terms of wasting significant amounts of paper, electricity, human resources, ink, pencils, etc. by requiring the license renewal process at intervals more frequently than necessary.

5.0 Conclusion

There will be no significant environmental impacts associated with granting of the proposed action. The benefits will be significant in that the undue burden and use of resources for the license renewal process will be minimized. If the proposed action is granted, facility resources can be used towards promoting nuclear science and engineering education and research instead of on relicensing activities. This is a crucial time for the UMR Reactor Facility. It is imperative that we show strong utilization in research and education over the next few years. Granting of the proposed action will free up our resources for use on the challenges that face us without adversely effecting the environment.