

# Manhattan College

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MECHANICAL ENGINEERING DEPARTMENT

August 17, 1983

Mr. Richard W. Starostecki, Director  
Division of Project and Resident Programs  
United States Nuclear Regulatory Commission  
Region 1  
631 Park Avenue  
King of Prussia, Pa. 19406

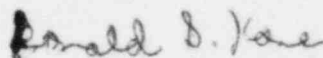
Subject: Inspection No. 50-199/83-01

Dear Mr. Starostecki:

In accordance with our August 5, 1983 response to your letter of July 11, 1983, we submit our complete response to the Notice of Violation (a Severity Level IV violation pertaining to an operator requalification program) and our response to the suggestions (not involving violations) in the report. By copy of this letter, we submit the Operator Requalification Program to the Licensee Qualifications Branch for their review and approval.

We hope our response to the inspection report and notice of violation is satisfactory. We will provide you with a status report on implementation of the operator requalification program at least three weeks prior to resumption of reactor operation. If we receive no response to our letter, we will still implement the program and assume it is acceptable to your office.

Very truly yours,



Dr. Ronald S. Kane  
Chairman, Mechanical Engineering Dept.  
Reactor Administrator

RSK/w  
encs

cc: U.S. Nuclear Regulatory Commission  
Licensee Qualification Branch  
Division of Human Factors Safety  
Phillips Building  
Bethesda, Maryland 20014

Att: H. Booher, Branch Chief for  
Licensee Qualification

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## ATTACHMENT A

Since the Manhattan College Zero Power Reactor is a research and test reactor licensed only for 0.1 watt maximum, the requalification program is guided by paragraph 7 of 10CFR55, Appendix A. The requalification program will be operated by Bro. Gabriel Kane, FSC, Ph.D. who has been reappointed Chief Reactor Supervisor, effective July 1, 1983. Bro. Gabriel Kane had been Chief Reactor Supervisor until June 30, 1980. Dr. Joseph Augustus served as Chief Reactor Supervisor from July 1, 1980 to June 30, 1983. In order to requalify Bro. Kane, Dr. Augustus (who remains on the Reactor Operations Committee) will evaluate any necessary requalification examinations administered to Bro. Kane. The requalification examination for Bro. Kane will be administered on September 1, 1983. We note that Bro. Kane holds a Doctorate in Physics from the Catholic University of America, has held a Senior Reactor Operator's License from November 6, 1968 to the present, and served as Chief Reactor Supervisor from November 6, 1968 to January 13, 1972 and again from May 4, 1973 to June 30, 1980.

On successful completion of the requalification examination by Bro. Kane, Bro. Kane will then operate requalification programs thereafter. In accordance with paragraph 7 of 10CFR55, Appendix A, the requalification program will conform generally but will not be identical to paragraphs 1 through 6 of 10CFR55, Appendix A.

1.           Schedule. The requalification program will be conducted continuously over two year cycles. The program will be revised as needed for each succeeding cycle to account for changes in equipment or operating procedures. For any individual whose operator or senior operator license approaches expiration during the two year cycle, a written examination illustrating the effectiveness of the program will be administered.
2.           Lectures. In consideration of the primary use of the Manhattan College Zero Power Reactor (MCZPR) as a teaching and demonstration tool for nuclear engineering courses, each licensed operator or senior operator normally must prepare and present lectures each semester on the theory, operation, and safety features of the MCZPR and nuclear facility. As part of the requalification program, the preparation and presentation of at least one lecture each semester on these subjects will be required of each licensed operator or senior operator.

3. On-the-Job Training. Since the MCZPR is a small research and test reactor, the requalification program requirements for production or utilization facilities do not strictly apply. However all licensed operators and senior operators will be required to make a complete checkout of the reactor and bring it to criticality at least once every four months. As has been the practice, all licensed operators and senior operators will serve on the Reactor Operations Committee. This insures that each licensed operator and senior operator is cognizant of facility design changes, procedure changes, facility license changes and is aware of emergency procedures. The Reactor Operations Committee meets at least once each semester and maintains complete records of its meetings and activities.
4. Evaluation. Each licensed operator and senior operator shall be required to submit biennially to a written examination. The examination will include the following topics:
  - a) Fundamentals of reactor theory, including fission process, neutron multiplication, source effects, control rod effects, and criticality indications.
  - b) General design features of the core, including core structure, fuel elements, control rods, and core instrumentation.
  - c) General operating characteristics including effects of temperature and reactivity changes.
  - d) Design, components and functions of safety systems, including instrumentation, signals, automatic and manual features.
  - e) Components, capacity and functions of reserve and emergency systems.
  - f) Standard and emergency operating procedures for the facility.
  - g) Purpose and operation of radiation monitoring system including survey equipment.
  - h) Radiological safety principles and procedures.
  - i) Conditions and limitations in the facility license or authorization.
  - j) Facility license procedures required to obtain authority for design and operating changes in the facility.

4. (continued)

- k) Reactor theory, including details of fission process, neutron multiplication, source effects, control rod effects, and criticality indications.
- l) Procedures and limitations involved in initial core loading, determination of various internal and external effects on core reactivity.

Any licensed operator or senior operator who scores less than 80% in the biennial examination will be required to take a make-up examination. All examinations will be kept on file for at least two years.

As administrator of the requalification program, the Chief Reactor Supervisor will be exempt from the requirement to submit to an annual examination. However, a newly appointed Chief Reactor Supervisor must submit to a written examination (administered by the outgoing Chief Reactor Supervisor) at some time during the first three months of his appointment. Operators or senior operators possessing at least a Master's Degree in Nuclear Engineering and who have taught an undergraduate or graduate nuclear engineering course during the preceding or current academic year may be exempted by the Chief Reactor Supervisor from the theoretical part of the written examination.

Licensed operators or senior operators shall be observed by the Chief Reactor Supervisor, at least once every four months, in checking out the reactor and bringing the reactor to criticality. A newly appointed Chief Reactor Supervisor, upon certification by the previous Chief Reactor Supervisor that his performance in checking out and operating the reactor is satisfactory, shall be exempt from further observation.

- 5. Records. Records documenting the participation of each licensed operator and senior operator in the requalification program will be maintained for a minimum of two years from the date of each recorded event. The records shall contain copies of all examinations and evaluations.
- 6. Alternative training programs. Such programs are not required for the MCZPR.

ATTACHMENT B

Comments on Inspection Report

- a) Item 3, Organization (No violations)  
Mr. R. Berlin is identified as the "Radiological Safety Officer". This position is more correctly identified as the "Radiation Safety Officer".  
Mr. M. Niknam is identified as "Reactor Operator Trainer", this should be "Reactor Operator Trainee".
- b) Item 6, Separation of Potentially Contaminated Water from Water Supply. (No violations)  
As noted in the report, this has not been a problem, however steps have been taken to assure that an air brake will always be present between the end of the plastic hose and the reactor pool water surface during the addition of water to the pool. A vacuum breaker and check valve were installed on the bantam demineralizer to provide the requested air break. (83-01-01).
- c) Item 9, Operator Requalification Program (Level IV Violation)  
(This is discussed earlier in this response letter; also refer to our August 5, 1983 letter discussing the statements in the inspection report with regard to approval or disapproval of the program submitted in our July 7, 1975 letter; the words "did not approve" might be more correctly stated as "did not respond to".)
- d) Item 10, Procedures (no violations noted)  
The suggested review, revision if needed, approval, and dating of the procedures noted in the inspection report will be done during the fall semester. These items will be on the agenda of the Fall 1983 meeting of the Reactor Operations Committee (83-01-03).
- e) Item 11, Surveillance Activities (no violations)  
Baseline acceptance values for the modulus of rigidity tests on the lucite hold-down rods will be established during the fall semester and will be discussed at the next meeting of the Reactor Operations Committee (83-01-04).
- f) Item 12, Radiation Control (no violations)  
The nomenclature and units on radioactive contamination will be revised in accordance with the suggestions of the inspector.