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February 2, 1994

U. S. Nuclear Regulatory Commission
 Washington, D. C. 20555
 ATTN: James L. Caldwell, Mail Stop 10/D/22

Reference: Oregon State University TRIGA Reactor (OSTR),
 Docket No. 50-243, License No. R-106

Subject: Licensing Examination for Mr. S. P. Smith, and Mr. J. S. Bae.

Gentlemen:

In accordance with the procedures specified in your letter of November 3, 1993, we would like to take this opportunity to submit formal comments on the written examination conducted at our facility on January 31, 1994. Before addressing specific questions, we would first like to state that everyone involved in the exam felt that it was fair and reasonable. We would also like to thank the examiner, Mr. Eresian, for his effort to put the examinees at ease.

Our comments on specific questions are given below in the required format.

Question A.006

- a. Answer b., 0.104 delta k/k (\$13.33); Reference OSTR Training Manual Volume 3, page 11.
- b. 0.104 delta k/k is the correct answer; however, the conversion to dollars is incorrect. Effective beta for the OSTR is 0.007, and therefore, 0.104 delta k/k is equivalent to \$14.86. Consequently, there is no one completely correct answer. All of the other conversions to dollars are also incorrect.

Our recommendation is to still accept b. as the most correct answer since the problem is set up in such a way that most people would obtain a result in delta k/k rather than dollars.

- c. Reference for effective beta: OSTR Training Manual Vol. 3. page 30.

Question A.017

- a. Answer a., Rate of power rise to 1 MW is slower than assumed by the procedure; Reference OSTROP 8.0, step 8.4.E.
- b. This is the only poorly worded question in the examination. We feel that it is written in a very unclear and confusing manner. Each of the answers seems to assume that there is a distinction between measured values of a parameter and the values used in the calculation. In fact, they are the same. In other words, when a power calibration is performed readings are taken of the initial bulk water temperature, the final bulk water temperature, and the length of time at power. These values are then substituted into the equation to determine if the actual power level is above or below the indicated power. Therefore, to talk about, for example, the "actual time of power rise" and the "value used in the calculation" as two separate values is inappropriate and confusing. The same is true of the temperatures.

Our recommendation is to delete this question from the examination.

- c. Reference: OSTROP 8.4 describes the procedure for performing a power calibration, including taking the readings and substituting them into the equation given to determine the actual power level.

Question B.001

- a. Answer c., 1000 degrees C; Reference Technical Specification 2.1, page 6.
- b. While this reference is still in the Technical Specifications, the OSTR has not operated with any standard fuel elements since 1976 when the reactor was refueled with FLIP fuel. In addition, we do not have any standard fuel elements on site, and therefore do not have the possibility of even using a mixed core. It is for this reason that all of our training has related to FLIP fuel, and the FLIP safety limit is the one that we have emphasized because that is the one the operators need to know.

Our recommendation is to delete this question from the examination as being irrelevant to the operation of the OSTR.

- c. References for the non-availability of standard fuel elements include the Fuel Element History Log, and the Special Nuclear Material accountability log.

Question B.014

- a. Answer a., Ventilation system inoperable; Reference Technical Specification 3.7.1, page 14.
- b. This answer is incorrect. There are two correct answers, b. and c.

Our recommendation is to accept either b. or c. as correct.

- c. Reference for a. being incorrect: Technical Specification 3.7.1, page 14.

Reference for b. being correct: Technical Specification 5.2.d, page 25, which states that the reactor "shall not be operated at power levels exceeding 1 kW with a core lattice position vacant...". This clearly infers that at power levels less than or equal 1 kW it is acceptable to operate with a vacant core lattice position.

Reference for c. being correct: Technical Specification 3.8.g, page 16. This states that "the total inventory of iodine isotopes 131 through 135 in the experiment is no greater than 1.5 curies." Therefore, 1.5 curies is acceptable.

Question B.018

- a. Answer b., "is required to be present at the complex only during the initial startup each day or at the initial startup of a new experiment.": Reference OSTROP 6.6.B.1, page IV.6.19.
- b. While the wording in answer b. is a direct quotation from the referenced page, in practice there are at least two other times when the reactor supervisor is required to be present at the facility, which is contradictory to the "only" in answer b.

OSTROP 3 on page IV.3.1 states that the "senior reactor operator in charge will review the checklist form and affix his signature when the shutdown checks have been satisfactorily completed." The terms "senior reactor operator in charge" and "reactor supervisor" are synonymous in the OSTR procedures and have been used interchangeably over the years. Therefore, the reactor supervisor must also be present in the facility to sign off on the shutdown checklist and the console log book.

In addition, OSTROP 4.7.C on page IV.4.12 states that "Each and every time an unplanned scram occurs, the console operator will inform the Reactor Supervisor. The console operator will not restart the reactor without the permission of the Reactor Supervisor and will obtain his initials in the console log book." Therefore, this is another instance in which the reactor supervisor has to be present in the facility. OSTROP 1.2.c has a similar statement.

Our recommendation is that this question be deleted from the examination because there is no correct answer.

- c. References giving other times the reactor supervisor must be present include: OSTROP 3, page IV.3.1, OSTROP 4.7.C on page IV.4.12 and OSTROP 1.2.c, page IV.1.2.

Question B.020

- a. Answer a., Reactor Power; Reference OSTROP 4.2.18 page, IV.4.4.
- b. The referenced procedure states correctly that "if the reactor is to be

operated at a power of 100 kW or greater, turn on the primary and secondary cooling systems." However, the parameter which is practically used to determine whether the secondary water cooling systems are used or not is the bulk water temperature, i.e. answer b.

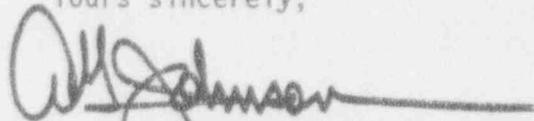
The bulk water temperature is the parameter which directly determines how much, if any, secondary cooling is necessary. Clearly, this is normally a function of the reactor power, but it is also a function of the ambient outside temperature. The operator watches the bulk water temperature and adjusts the cooling requirements accordingly. The procedure tells the operator to turn on cooling capacity if the reactor is to be operated above 100 kW because at those power levels it is usually necessary. However, there are various procedures, which allow the reactor to be operated without primary and/or secondary cooling (such as reactor power calibration), but in each case the primary limiting parameter is the bulk water temperature and not the reactor power. Further evidence for this is given in Technical Specification 3.7.2.b on page 14, which requires the water temperature not to exceed 49 degrees C.

Our recommendation is that answer b. be accepted as a correct answer in addition to answer a.

- c. The reference for the primacy of water temperature is Technical Specification 3.7.2.b on page 14. OSTROP 8 is the power calibration procedure which is one example of when the power level exceeds 100 kW without the primary or secondary cooling system operating.

We appreciate the opportunity to submit these comments. Also let me once again emphasize that we do not want these comments to be regarded in any way as an indication of our dissatisfaction with the written examination. We merely wish to ensure that the examination is as fair as possible, by eliminating areas of possible ambiguity. Thank you for considering our recommendations.

Yours sincerely,



A. G. Johnson
Director

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