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UNITED STATES
ATOMIC ENERGY COMMISSION
WASHINGTON, D.C. 20545

August 26, 1971

50-220

Niagara Mohawk Power Corporation
ATTN: Mr. J. F. Schneider
Vice President - Operations
300 Erie Boulevard West
Syracuse, New York 13202

Gentlemen:

This letter refers to the inspections conducted on March 3, 10-12, and 16-18, 1971, of your activities authorized under AEC License No. DPR-17. It also refers to the discussions held between Messrs. R. J. McDermott and D. L. Pomeroy, Division of Compliance, and Mr. T. Perkins, Assistant Station Superintendent, on March 18, 1971.

With respect to the inspections, it appears that certain of your activities were not in full compliance with license requirements. These matters, which were discussed with your representatives at the March 18, 1971 meeting, are identified in the enclosure to this letter.

This notice is sent to you pursuant to the provisions of Section 2.201 of the AEC's "Rules of Practice," Part 2, Title 10, Code of Federal Regulations. Section 2.201 requires you to submit to this office, within 20 days of your receipt of this notice, a written statement or explanation in reply including: (1) corrective steps which have been taken and the results achieved; (2) corrective steps which will be taken; and (3) the date when full compliance will be achieved.

In addition to the items of noncompliance, our inspectors also identified another matter we believe warrants your consideration. This matter relates to information in your Final Safety Analysis Report, Appendix D, Section 3.2.1.b., which provides that an investigation to scope the radioactivity buildup taking place in edible aquatic animals will be conducted whenever the maximum permissible concentration (MPCC)1/ guide value for radionuclides in liquid effluents is approached in the unrestricted environment. In this regard, we note that measured

1/ The abbreviation MPCC denotes the maximum permissible concentration for a radionuclide in water considering buildup possibilities in edible aquatic animals.

concentrations of iodine-131 in plant releases have exceeded 75 percent of the MPCC guide concentrations given in Table D-13 of your Final Safety Analysis Report. In your reply to this notice, please provide us with the results of your investigation including the steps taken or planned to reduce these concentrations in subsequent releases.

As discussed in Paragraph No. 2 of the enclosure to this letter, the Technical Specifications require the total activity discharged in liquid effluents to be reported in semi-annual reports to the AEC. For reasons described in the enclosure, liquid effluent activity values in previous semi-annual reports do not accurately reflect the total number of curies discharged. Therefore, in addition to your reply to this letter, please provide the Director, Division of Reactor Licensing (USAEC, Washington, D. C. 20545) with corrected values for the total activity released from the plant in liquid effluents. In the event that precise information is unavailable to correct previous data for the total number of curies released, estimates of the quantities, including the assumptions and bases for these estimates, should be provided.

Very truly yours,

Original signed by:
L. D. Low

Lawrence D. Low, Director
Division of Compliance

Enclosure:
As Stated

cc:w/enclosures
Mr. P. A. Burt, Station
Superintendent
Nine Mile Point Nuclear Station
P. O. Box 32
Lycoming, New York 13093

bcc: A. Giambusso, CO
P. A. Morris, DRL
D. J. Skovholt, DRL
D. L. Ziemann, DRL
DR Reading File
DR Central File
R. F. Fraley, ACRS (3)
PDR
R. L. Shannon, OR
NSIC
CO:I, II, III, IV, And V

OFFICE ▶	7m CO 7M gw	CO	DRL	CO		
SURNAME ▶	FJNolan:mm JGKeppler	RHEngelken	DJSkovholt	LDLow		
DATE ▶	8/24/71	8/25/71	8/25/71	8/26		

Enclosure

NIAGARA MOHAWK POWER CORPORATION
DOCKET NO. 50-220

Items of Noncompliance with Regulatory Requirements: 1/

1. Paragraph 3.C.(2) of the Provisional Operating License requires submittal of a written report to the Director, Division of Reactor Licensing, of "any substantial variance disclosed by operation of the facility from performance specifications contained in the Final Safety Analysis Report (safety analysis report) or the Technical Specifications".

   Contrary to Paragraph 3.C.(2) of the Provisional Operating License, a written report was not provided to the Division of Reactor Licensing to reflect the substantial variance from performance specifications in the operation of the liquid radioactive waste system. Plant records disclosed that the isotopic concentrations in liquid wastes released for the year 1970 were substantially in excess of the predicted values contained in the Final Safety Analysis Report, Appendix D, Table D-18. Specific examples of the above include the following:

   a. The measured concentration of iodine-131 in liquid effluents during October, 1970, was 1.8×10^{-8} uCi/ml, or greater than 20 times the expected value of 8×10^{-10} uCi/ml.

   b. The measured iron-59 concentration in plant liquid releases for September, 1970, was 1.4×10^{-8} uCi/ml, or 700 times the expected value of 2×10^{-11} uCi/ml.

   c. The annual average concentration of radioactivity measured in liquid effluents for 1970; based on a gross beta analysis, was 1.8×10^{-8} uCi/ml, or 1.5 times the expected total concentration of 1.2×10^{-8} uCi/ml, in Table D-18.

2. Paragraph 6.7.b.(1)(a) of the Technical Specifications requires the total activity discharged in liquid effluents to be reported in the semi-annual reports to the AEC.

   Contrary to Paragraph 6.7.b.(1)(a) of the Technical Specifications, the semi-annual reports did not report the total activity discharged in liquid effluents. The semi-annual reports provided the total number of curies of activity released in radioactive effluents based

1/ The references shown for the items of noncompliance are those corresponding to your license in effect at the time of the inspection.

on gross beta analyses of the effluents. Our review of periodic gamma analyses of liquid effluents disclosed that the gross beta analyses account for only approximately one-third of the total activity.

3. Paragraph 10 CFR 20.201(b) of the AEC's "Standards for Protection Against Radiation" requires each licensee to make such surveys as may be necessary to comply with the regulations in 10 CFR 20.

   Contrary to paragraph 10 CFR 20.201(b) "Surveys", surveys were not adequate to determine compliance with 10 CFR 20.103 with respect to airborne concentrations of radioactive material to which employees were exposed on September 29, 1970, during maintenance activities on the No. 10 cleanup system valve. It was found that one individual received nasal contamination of 4×10^5 disintegrations per minute. Furthermore, whole body counting was not performed until November 18, 1970, to determine the extent of exposure to this individual.

JUN 17 1971

D. J. Skovholt, Assistant Director for Reactor Operations (3)
Division of Reactor Licensing

NIAGARA MOHAWK POWER CORPORATION (NINE MILE POINT) -
DOCKET NO. 50-220

The enclosed report of inspections of the subject facility on March 2-5, 10-12, and 16-18, 1971, is forwarded for information.

Several deficiencies involving noncompliance or safety considerations were identified during these inspections. The most significant of these are as follows:

a. The performance of the liquid waste system is not meeting design objectives to limit radioactive effluents from the plant. Furthermore, the system evaporator has not been utilized to the extent practicable. System design objectives were specified to limit liquid effluent releases to 0.2 curies per month for current levels of radioactivity in the primary system. Actual releases have averaged 2.8 curies per month for the last 14 months.

b. Certain isotopic concentrations in liquid effluents released during calendar year 1970 were substantially in excess of predicted values specified in the FSAR. Specifically,

   1. Iodine 131 releases exceeded the expected value by a factor of 20 during October 1970.

   2. Iron 59 releases exceeded the expected value by a factor of 700 during September 1970.

c. Inadequate radiological safety controls during a maintenance activity resulted in one individual receiving nasal contamination levels of 4×10^5 dpm. Whole body counting of this individual was not performed until 50 days later.

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We are currently reviewing our findings and expect to issue an enforcement letter to the licensee in the near future.

Reactor operations were resumed on May 31, 1971, following a six-weeks maintenance outage. Since that time operations have been interrupted on two occasions as a result of vibration problems with the high pressure turbine moisture separator. The projected stack off-gas release rate at 1538 Mwt is 20,000 microcuries per second.

In addition to our findings on this inspection, recent inspections of Ginna (CO Report No. 244/71-2), Oyster Creek (CO Report No. 219/71-1), Saxton (CO Report No. 146/71-1), San Onofre (CO Report No. 206/71-2), Big Rock Point (CO Report No. 155/71-5), and Dresden 1, 2, and 3 (CO Report No. 237/71-6) have revealed problems and deficiencies in the handling, processing, and evaluation of radioactive effluents. Some of these problems appear to have broad applicability to licensed facilities. We are currently assembling and evaluating our inspection findings. Following completion of our evaluation, we plan to meet with you and other cognizant regulatory representatives to discuss our overall findings and our recommended plan of action.

Original signed by
R. H. Engelken

R. H. Engelken, Assistant Director
for Inspection and Enforcement
Division of Compliance

Enclosure:
Inspection Report -
Nine Mile Point

cc w/enclosure:
M. M. Mann, DR
E. G. Case, DRS (3)
R. S. Boyd, DRL (2)
R. C. DeYoung, DRL (2)
H. Denton, DRL (2)
A. Giambusso, CO
L. Kornblith, Jr., CO
Regional Directors, CO
R. Carlson, CO:I
REG Files

OFFICE ▷	CO	CO				
SURNAME ▷	JGKepplerAEP JPOReilly	RHEngelken				
DATE ▷	6/16/71	6/16/71				

MAR 27 1971

R. T. Carlson, Senior Reactor Inspector, CO:I
THRU: H. R. Denton, Chief, Technical Support Branch, CO:HQ

ASSIST INSPECTION - NINE MILE POINT - LIQUID WASTE SYSTEMS
DOCKET NO. 50-220

Introduction

This memo contains the result of an assist inspection conducted by Mr. D. Pomeroy on March 10 and on March 16-18, 1971, of the liquid waste system at Nine Mile Point. The assigned inspector, Mr. R. McDermott, participated in the discussions on the noncompliance and nonconformance items with the licensee's management.

Scope

The inspection followed the procedures in PI-3300/1 for liquid waste systems, with particular emphasis on Section 3315.04.C which required a determination of the extent to which waste treatment facilities are being utilized. Operations for 1970 and for the first two months of 1971 were reviewed. Within these areas, the inspection consisted of selective examinations of representative records, interviews with plant personnel, and observations by the inspector.

Principal Findings

a. Released Liquid Activity

The Technical Specifications allow liquid effluents to be determined only on the basis of gross beta activity. On this basis, the licensee has reported[1/] a total of 9.44 curies of radioactivity released to the lake in 1970. A review of the station records of monthly gross gamma analysis indicates that approximately 28 curies were actually released. It appears that the control of liquid effluents is in accordance with Technical Specification 3.6.1.B. However, the licensee appears to be in noncompliance with Section 6.7.D(1) which

1/ Nine Mile Point Semi-Annual Reports, January 1, 1970 - June 30, 1970 - July 1, 1970 - December 31, 1970.

requires that the total activity discharged in liquid wastes be reported in the semi-annual reports. Table I provides a summary of beta and gamma activity released in liquids for the period of the inspection.

b. Sampling Lake Water

The licensee interprets the basis of Technical Specification 3.6.1.B for weekly lake samples when the circulating water system discharge rate exceeds 1/3 of the annual limit (1/3 of 1×10^{-7} uCi/ml) to apply only when this rate has persisted for 52 weeks. On the gross beta analysis basis, the 1/3 rate was exceeded for the months of January and May, 1970 and January and February 1971. Only two lake water samples were taken in 1970 and plans for 1971 include only two samples. The licensee, therefore, appears to be in nonconformance with the basis in that a weekly sampling program is not initiated when the release rate exceeds 1/3 of the limit.

c. MPCC Guide Values[2/]

The environmental monitoring program in Appendix D.4.2 to the FSAR is referenced as the basis for the liquid release rate. This appendix states that "the relation between radionuclide concentration and associated MPCC values will be closely watched". The licensee appears to be in nonconformance with this basis in that releases have approached MPCC guide concentrations (see Table II), but Mr. R. Burns stated that there is no program to study this relationship nor determine the appropriateness of these guides.

d. Extent of System Usage

The principal sources of radioactivity released to the lake is the floor drain system. Radioactivity is removed from this system by filtration. The filtered floor drains may then be processed by the waste concentrator or may be released. It does not appear that the waste concentrator has been used in processing floor drains to the extent practical, in that although the concentrator is used only about one day a week for neutralizer wastes, it was operated for only four days during 1970 for floor drains. The licensee's procedures to concentrate floor drain water only when the gross beta concentration is above 2×10^{-3} uCi/ml are in noncompliance with the proposed Technical Specifications[3/] which incorporate the low as practicable requirements.

2/ These values are developed in the FSAR by considering buildup in edible aquatic animals.

3/ Ltr. P. A. Morris to D. J. Bronsan. Notice of Proposed Issuance of Amendment to Provisional Operating License. March 3, 1971.

e. System Performance

A review of the liquid radwaste system design objectives was made and compared with system performance. The review of the design objectives[4/] indicate that the expected liquid release rate for the fuel failures experienced to date (as measured by the activity in the primary coolant) is approximately 0.2 curies per month. The average performance during this period (the past 14 months) has been 2.8 curies per month. (See chart - Figure 1).

Mr. Burns stated that the only program for studying the performance of the liquid radwaste system consists of a utility industry-wide - General Electric research and development project. The details of this project are being developed. In the meantime, the licensee has no plans to sample incomming water; to determine equipment decontamination factors nor access the overall performance of the liquid radwaste system.

f. Expected Isotopic Distribution

The isotope concentrations expected to be released during operation without significant fuel failures are listed in Table D-18 of the FSAR. A comparison of this table with the monthly average concentrations at the point of discharge listed in the licensee's second semi-annual report for 1970, indicates a wide disparity. For example, actual concentrations for iodine 131 for October 1970, were over 20 times the expected value. The iron 59 concentrations for September 1970 were 700 times the expected value.

The expected MPC for a mixture of liquid effluents from a reactor free of fuel failures has been given by GE as 2×10^{-5} uCi/ml[5/]. The actual MPC's for the mixtures being released have been as high as 1×10^{-6} uCi/ml[6/].

g. Isotopic Analysis

The Technical Specifications (4.6.1.B) require an isotopic analysis to be performed monthly when effluent concentrations are greater than 10% of the annual average limit. In reviewing the methods used to determine the isotopic analysis from the gamma scan, an error in the

4/ General Electric Company, Drawing No. 104R36, last issued January 1967.

5/ General Electric Input for Safety Analysis Report (GEISAR), Table 9.2.2.

6/ Calculated from second Semi-Annual Report - 1970, for October; 6×10^{-8} uCi/ml = 6%.

chromium 51 geometry - self-shielding factor was detected. Further investigation revealed that the detector efficiency used for chromimum 51 was also in error. These errors were acknowledged by Mr. Burns and the calculations were redone before the close of the inspection. The errors affected only the January and February 1971 releases and had a net effect of increasing the Cr-51 concentrations by a factor of 2.5 and the gamma to beta ratio increased from about 1.3 for each month to 3.1 for January and 4.6 for February.

Exit Interview

During the exit interview, at the conclusion of the inspection, Mr. Perkins was informed that the principal station staff[7] believed that the performance of the liquid waste treatment had generally been satisfactory (with the exception of minor maintenance items), that releases were as expected or less than expected and isotopic distribution was normal. The findings of the inspection were then presented to Mr. Perkins, and he was informed that the performance of the radwaste system should be covered in the next semi-annual report. (This requirement is specified in the proposed Technical Specifications as follows: "If quantities...are unusual... the report shall cover this specifically".) Mr. Perkins made no commitments concerning any of these findings.

D. L. Pomeroy
Nuclear Engineer
Technical Support Branch
Division of Compliance

Attachments:
As stated

cc: A. Giambusso, CO
L. Kornblith, CO
R. H. Engleken, CO
J. P. O'Reilly, CO
Senior Reactor Inspectors

[7] Mr. R. Burns, Health Physics Supervisor; Mr. T. E. Lempges, Operations Supervisor and Mr. M. Silliman, Results Supervisor.

OFFICE ▶	CO:TSB	CO:TSB				
SURNAME ▶	DLPomeroy:kaf	HRDenton				
DATE ▶	3/26/71	3/ /71				

Nine Mile Point - Liquid Release Summary
Jan 70 - Feb 71

Month	Curies Reported	Waste Discharged Gallons	Dilution Water Gallons	Reported Concentrations µCi/ml	γ/B	Estimated[1/] Actual Curies
JAN	1.529	5.65 (5)	8.22 (9)	4.89 (-8)	3.5	5.35
FEB	1.095	6.23 (5)	9.43 (9)	3.06 (-8)	4.2	4.60
MAR	0.377	5.10 (5)	10.26 (9)	0.96 (-8)	1.9	0.72
AP	0.446	3.78 (5)	6.56 (9)	1.79 (-8)	2.9	1.30
MAY	0.965	5.64 (5)	6.32 (9)	4.02 (-8)	5.0	4.82
JUNE	0.336	3.87 (5)	9.34 (9)	9.47 (-9)	4.5	1.51
JULY	0.130	5.64 (5)	11.41 (9)	3.00 (-9)	2.0	0.26
AUG	0.564	5.89 (5)	11.86 (9)	1.25 (-8)	1.1	0.62
SEPT	1.252	6.17 (5)	12.09 (9)	2.72 (-8)	3.5	4.38
OCT	1.247	4.64 (5)	11.21 (9)	2.93 (-8)	2.1	2.62
NOV	0.854	2.71 (5)	11.23 (9)	2.00 (-8)	1.2	1.03
DEC	0.642	2.52 (5)	11.35 (9)	1.52 (-8)	1.3	0.84
JAN	1.471	3.42 (5)	8.64 (9)	4.48 (-8)	3.1	4.56
FEB	1.526	3.14 (5)	8.07 (9)	4.99 (-8)	4.6	7.02

1/ Assumes measured γ/B constant for the month.

TABLE I

Operating Experience Compared With
Guide Values

Isotope	MPCC 1/	Actual Concentration CWS 2/	% of MPCC
Cr^{51}	4×10^{-7}	0.5×10^{-7}	12
Co^{58}	6.7×10^{-8}	1.5×10^{-8}	22
Co^{60}	4.5×10^{-8}	0.8×10^{-8}	17
Fe^{59}	2.0×10^{-8}	1.4×10^{-8}	70
I^{131}	2.3×10^{-8}	1.8×10^{-8}	78

1/ From Table D-13, FSAR
2/ Highest Monthly Average from 2nd Semi-annual Report 1970

TABLE II

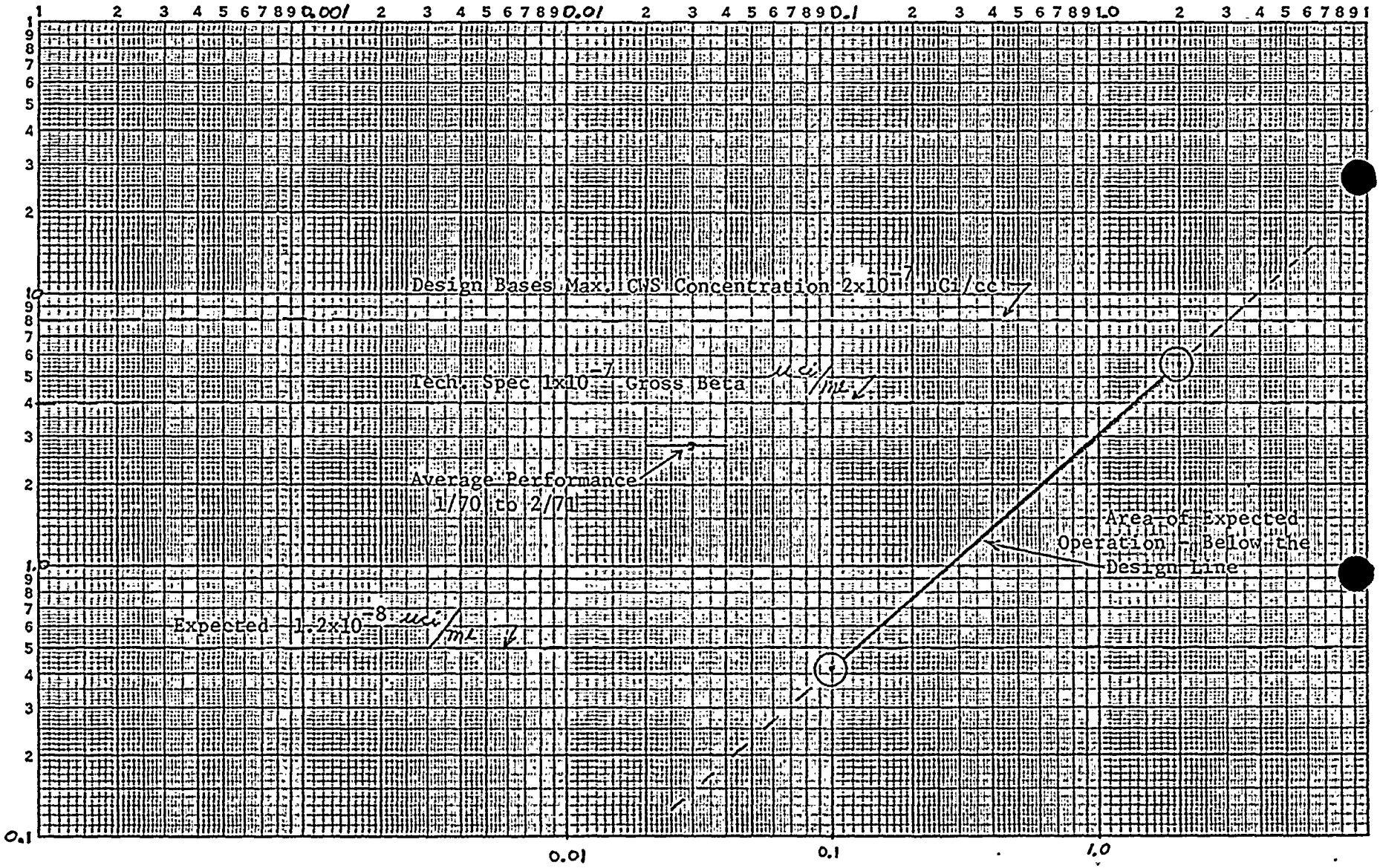
K+E LOGARITHMIC 358-125
KEUFFEL & ESSER CO. MADE IN U.S.A.
3 X 5 CYCLES
PRIMARY COOLANT ACTIVITY µCi/ml
Release Rate Ci/mo.
Design Bases Max. CWS Concentration 2x10⁻⁷ µCi/cc
Tech. Spec 1x10⁻⁷ Gross Beta µCi/ml
Average Performance
1/70 to 2/71
Area of Expected
Operation Below the
Design Line
Expected 1.2x10⁻⁸ µCi/ml
0.001
0.01
0.1
1.0
0.01
0.1
1.0

FIGURE I