

YANKEE ATOMIC ELECTRIC COMPANY

20 Turnpike Road Westborough, Massachusetts 01581

September 15, 1977

United States Nuclear Regulatory Commission
Washington, D. C. 20555

SEP 21 1977

Attention: United States Nuclear Regulatory Commission
Office of Management Information & Program Control
Operating Data Branch, 12105 MNBB

Reference: (a) License No. DPR-3 (Docket No. 50-29)
(b) License No. DPR-28 (Docket No. 50-271)
(c) License No. DPR-36 (Docket No. 50-309)
(d) NRC letters to the above licensees dated
August 26, 1977.

Dear Sir:

Subject: Review of NRC Summary of Commercial Nuclear Power
Plant Radioactive Effluents

Review of your preliminary summary sheets, compiled from our semi-annual submittals, has revealed certain differences regarding uniform treatment of less-than (<) values. The use of less-than values in the report represent those calculations based on the minimum detectable limits of the instrumentation. If the input consists of less-than values only, then the total for the period is a summation of the numerical values. However, where input consists of less-than values and real values, only the real values are summarized for the period.

It appears that your summations are not consistent in the use of less-than values. We have prepared summary tables (Attachment I) for each plant consisting of two columns, one including less-than values and the other not including less-than values. Attachment II consists of your preliminary summary sheets with additional marginal notes.

After your review of the attached tables and notes, we recommend that Mr. Decker contact Mr. John Parillo (617-366-9011, Ext. 56-343) for further discussion of our data compilation methods.

Very truly yours,

YANKEE ATOMIC ELECTRIC COMPANY

R. H. Groce
Licensing Engineer

THIS DOCUMENT CONTAINS
POOR QUALITY PAGES

RHG/kg

8010310

712

P

772650076

ATTACHMENT I

Y-R EFFLUENT SUMMARY 1976

<u>AIRBORNE</u>	CURIES	
	TOTAL WITH <	TOTAL WITHOUT<
A) Total Noble Gases	2.57 E+01	2.57 E+01
B) Total I-131	<5.39 E-05	2.55 E-05
C) Total Halogens (including I-131)	<4.82 E-04	1.34 E-04
D) Total Particulates	<2.31 E-05	1.75 E-05
E) Total Tritium	2.02 E+00	2.02 E+00
<u>LIQUID</u>		
A) Total Mixed Fission & Activation Products	*9.41 E-03	9.05 E-03
B) Total Tritium	1.56 E+02	1.56 E+02
C) Dissolved Noble Gases	<3.08 E-02	2.77 E-02

*NRC summed only quarterly values to get 9.29 E-03. Listed total includes all (monthly) reported "less than" values.

VY EFFLUENT SUMMARY 1976

<u>AIRBORNE</u>	CURIES	
	TOTAL WITH <	TOTAL WITHOUT<
A) Total Noble Gases	3.04 E+03	2.87 E+03
B) Total I-131	2.18 E-03	2.18 E-03
C) Total Halogens (including I-131)	7.06 E-02	1.04 E-02
D) Total Particulates	5.87 E-03	5.68 E-03
E) Total Tritium	1.42 E+01	1.42 E+01
<u>LIQUID</u>		
A) Fission and Activation Products	5.23 E-04	5.07 E-04
B) Total Tritium	1.60 E+00	1.60 E+00
C) Dissolved Noble Gases	6.28 E-03	6.28 E-03

MY EFFLUENT SUMMARY 1976

<u>AIRBORNE</u>	CURIES	
	TOTAL WITH <	TOTAL WITHOUT<
A) Total Noble Gases	<1.30 E+03	1.30 E+03
B) Total I-131	<1.80 E-03	1.56 E-03
C) Halogens (including I-131)	<2.25 E-03	1.64 E-03
D) Total Particulates	<2.11 E-03	4.33 E-04
E) Total Tritium	3.68 E+00	3.68 E+00
<u>LIQUID</u>		
A) Fission and Activation Products	<2.84 E+00	2.84 E+00
B) Total Tritium	3.67 E+02	3.67 E+02
C) Dissolved Noble Gases	<5.21 E-02	5.21 E-02

ATTACHMENT II

FACILITY: YANKEE ROWE
 TYPE: PWR
 LOCATION: 20 MI NW GREENFIELD MA
 COOLING WATER SOURCE: DEERFIELD RIVER

DOCKET NO: 50-29

LICENSED POWER (MWT): 600.0 0.0 0.0

INITIAL CRITICALITY: 08/19/60

OPERATION

GROSS THERMAL GENERATION

47,000 (110)
812009.0

MWT

NET ELECTRICAL

241916.0
1,211 (100%)

MWE

THERMAL CAPACITY FACTOR
 DURING COMMERCIAL OPERATION)

15.4

PER CENT

SUMMARY OF EFFLUENTS

AIRBORNE

A)	TOTAL NOBLE GASES	2.57E+01	CURIES
B)	TOTAL I-131	2.55E-05	CURIES
C)	TOTAL HALOGENS (INCLUDING I-131)	1.33E-04	CURIES
D)	TOTAL PARTICULATES	<1.04E-05	< 2.22 E-05 CURIES
E)	TOTAL TRITIUM	2.02E+00	CURIES

LIQUID

A)	TOTAL MIXED FISSION AND ACTIVATION PRODUCTS	<9.47E-03	<9.30E-03 CURIES
B)	TOTAL TRITIUM	1.56E+02	CURIES
C)	DISSOLVED NOBLE GASES	2.77E-02	CURIES
D)	VOLUME OF LIQUID WASTE RELEASED	1.06E+07	LITERS
E)	VOLUME OF DILUTION WATER	2.50E+11	LITERS

SOLID WASTE

A)	VOLUME	3.60E+02	CUBIC METERS
B)	ACTIVITY	2.65E+01	CURIES
C)	NUMBER OF SHIPMENTS	2.50E+01	

* IF SUMMARY
 VALUES ARE
 DIFFERENT THAN
 THE SUM OF
 ISOTOPES PLEASE
 EXPLAIN DISCREPANCY.

AIRBORNE EFFLUENTS (CURIES)

NOBLE GAS

AR-37	4.34E-01
AR-41	2.96E-01
KR-85	7.49E-02
KR-85M	2.50E-01
KR-87	1.60E-01
KR-88	3.95E-01
XE-131M -	3.47E-02
XE-133	1.91E+01
XE-133M -	3.79E-01
XE-135	3.39E+00
XE-135M	1.21E+00
XE-138	2.59E-02

HALOGENS

I-131	2.55E-05
I-133	4.07E-05
I-135	5.91E-05

PARTICULATES

U-14	1.22E-01 ← reported as a fission gas
CR-51	<1.80E-06
MN-54	<6.74E-07
FE-59	1.87E-06
CU-58	1.82E-06
CU-60	9.44E-06
SE-75	<3.83E-07
RB-86	1.26E+00 ← ? reported as a fission gas
SR-89	<1.14E-07
SR-90	<6.81E-08
MO/ZR-95	<6.14E-07
CS-134	<5.38E-07
CS-137	<5.12E-07
AG-110M	<7.12E-07
SB-124	<6.69E-07
BA/LA-140	<1.02E-07
C-14	0.0

TRITIUM

H-3	2.02E+
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PLEASE EXPLAIN USE OF UNUSUALLY LARGE
NUMBER OF LESS THAN VALUE

LIQUID EFFLUENTS (CURIES)

XE-133	2.74E-02
XE-135	2.91E-04
I-131	1.24E-03
I-133	3.85E-04
C-14	6.14E-03
GM-51	<4.61E-05
MN-54	1.41E-04
CO-58	2.58E-05
FE-59	<1.76E-05
CU-60	2.38E-04
ZN-65	<2.26E-05
SE-75	<6.64E-06
SR-89	1.00E-04
SR-90	5.59E-06
ZR/NB-95	<2.83E-05
MO-99	<9.89E-05
TC-99M	<1.01E-05
AG-110M	3.99E-06
SB-124	<8.65E-06
CS-134	1.99E-04
CS-136	1.68E-04
CS-137	4.38E-04
DA/LA-140	<2.55E-05
CE-141	7.97E-06
CE-144	<5.07E-05
UNIDENTIFIED	6.31E-05
TRITIUM	
H-3	1.56E+02

} Dissolved noble gases

-- Not reported by YR

$$\Sigma - (XE\ 133 + XE\ 135 + CS\ 136) = 9.3E-03$$

FACILITY: VERMONT YANKEE
 TYPE: BWR
 LOCATION: 5 MI S BRATTLEBORO VT
 COOLING WATER SOURCE: CONNECTICUT RIVER

DOCKET NO: 50-271

LICENSED POWER (MWT):

1593.0

0.0

0.0

INITIAL CRITICALITY:

03/24/72

OPERATION

GROSS THERMAL GENERATION

10192187.0

MWHT

NET ELECTRICAL

3260016.0

MWHE

THERMAL CAPACITY FACTOR
 (DURING COMMERCIAL OPERATION)

72.8

PER CENT

SUMMARY OF EFFLUENTS

* IF SUMMARY
 VALUES ARE
 DIFFERENT THAN
 THE SUM OF
 ISOTOPES PLEASE
 EXPLAIN DISCREPANCY

* D+C sum includes
 Less Than values

* YAEK sum does
 not include
 Less than values
 unless all values
 are less than

AIRBORNE

A) TOTAL NOBLE GASES

* 3.03E+03

CURIES

B) TOTAL I-131

2.10E-03

CURIES

C) TOTAL HALOGENS (INCLUDING I-131)

7.06E-02

CURIES

D) TOTAL PARTICULATES

5.84E-03

CURIES

E) TOTAL TRITIUM

1.43E+01

CURIES

LIQUID

A) TOTAL MIXED FISSION AND ACTIVATION PRODUCTS

5.23E-04

CURIES

B) TOTAL TRITIUM

1.60E+00

CURIES

C) DISSOLVED NOBLE GASES

6.28E-03

CURIES

D) VOLUME OF LIQUID WASTE RELEASED

3.14E+05

LITERS

E) VOLUME OF DILUTION WATER

8.72E+05

LITERS

SOLID WASTE

A) VOLUME

2.38E+02

CUBIC METERS

B) ACTIVITY

2.93E+01

CURIES

C) NUMBER OF SHIPMENTS

3.00E+01

AIRBORNE EFFLUENTS (CURIES)

NOBLE GAS

KR-85	<1.43E+02
KR-85M	<3.92E+01
KR-87	<6.16E+01
KR-88	<5.08E+01
XE-133	<4.47E+02
XE-135	<4.99E+01
XE-135M	<2.97E+02
XE-138	<1.95E+03

HALOGENS

I-131	2.18E-03
I-133	8.23E-03
I-135	<6.02E-02

PARTICULATES

CO-58	2.93E-04
CO-60	9.20E-04
ZN-65	9.07E-04
SR-89	2.24E-03
SR-90	8.23E-06
ZR-95	<1.59E-04
CS-134	<6.53E-05
CS-137	4.53E-05
CE-141	<1.73E-05
SB-124	2.76E-05
BA-140	8.08E-04
BA/LA-140	3.54E-04

TRITIUM

H-3	1.43E+01
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PLEASE EXPLAIN USE OF SO MANY
LESS THAN NOTATIONS

LIQUID EFFLUENTS (CURIES)

XE-133	3.14E-03
XE-135	3.14E-03
MN-54	1.34E-05
CO-57	5.37E-06
CO-60	8.73E-05
ZN-65	7.16E-05
SR-89	<1.57E-05
SR-90	1.44E-05
SD-124	5.00E-05
CS-134	3.53E-05
CS-137	1.83E-04
UNIDENTIFIED	1.70E-05
TRITIUM	
H-3	1.60E+00

FACILITY: MAINE YANKEE
 TYPE: PWR
 LOCATION: 3.9 MI S WICASSETT ME
 COOLING WATER SOURCE: BACK RIVER (ATLANTIC OCEAN)

DOCKET NO: 50-309
 LICENSED POWER (MWT): 2440.0 0.0 0.0
 INITIAL CRITICALITY: 10/23/72

OPERATION

GROSS THERMAL GENERATION	19552768.0	MWHT
NET ELECTRICAL	5928868.0	MWHE
THERMAL CAPACITY FACTOR (DURING COMMERCIAL OPERATION)	91.2	PER CENT

SUMMARY OF EFFLUENTS

AIRBORNE

A)	TOTAL NOBLE GASES	< 1.30E+03	CURIES
B)	TOTAL I-131	< 1.80E-03	CURIES
C)	TOTAL HALOGENS (INCLUDING I-131)	< 2.24E-03	CURIES
D)	TOTAL PARTICULATES	< 2.11E-03	CURIES
E)	TOTAL TRITIUM	3.68E+00	CURIES

LIQUID

A)	TOTAL MIXED FISSION AND ACTIVATION PRODUCTS	< 2.84E+00	CURIES
B)	TOTAL TRITIUM	3.67E+02	CURIES
C)	DISSOLVED NOBLE GASES	< 5.21E-02	CURIES
D)	VOLUME OF LIQUID WASTE RELEASED	1.33E+08	LITERS
E)	VOLUME OF DILUTION WATER	8.03E+11	LITERS

SOLID WASTE

A)	VOLUME	1.84E+02	CUBIC METERS
B)	ACTIVITY	5.04E+02	CURIES
C)	NUMBER OF SHIPMENTS	1.60E+01	

Y AEC SUM
 TABLE 1A.

* IF SUMMARY
 VALUES ARE
 DIFFERENT THAN
 THE SUM OF
 ISOTOPES PLEASE
 EXPLAIN DISCREPANCY

* NYC sums < values
 Y AEC does not
 unless all values
 are <

AIRBORNE EFFLUENTS (CURIES)

NOBLE GAS

KR-85	6.89E+01
KR-85M	<7.00E-07
KR-87	<2.10E-06
KR-88	<2.45E-06
XE-131M	<3.00E-06
XE-133	1.22E+03
XE-133M	<1.05E-06
XE-135	<9.77E+00
XE-135M	<2.90E-06
XE-138	<1.58E-06

HALOGENS

I-131	<1.80E-03
I-133	<2.31E-04
I-135	<2.10E-04

PARTICULATES

MN-54	1.01E-04
CO-58	<3.08E-04
CO-60	<3.29E-04
SR-89	2.92E-06
SR-90	1.33E-07
CS-134	<3.97E-04
CS-137	<5.64E-04
CE-141	1.01E-04
BA/LA-140	<3.03E-04
UNIDENTIFIED	2.83E-05

TRITIUM

H-3	3.68E+00
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PLEASE EXPLAIN USE OF SO MANY LESS
THAN NOTATIONS. SIMILARLY FOR LIQUID CASE.

LIQUID EFFLUENTS (CURIES)

XE-133	5.17E-02
XE-135	<2.36E-04
I-131	1.91E-01
I-133	9.28E-04
CR-51	<1.08E-05
MN-54	5.10E-03
CU-58	1.31E-01
FE-59	<2.78E-06
CO-60	1.77E-01
ZN-65	<1.24E-06
SR-89	<4.46E-04
SR-90	<4.45E-03
ZR/NB-95	<2.48E-06
MO-99	<3.28E-05
TC-99M	<3.08E-06
CS-134	6.55E-01
CS-137	1.54E+00
BA/LA-140	<6.57E-06
CE-141	<3.08E-06
UNIDENTIFIED	1.40E-01
TRITIUM	
H-3	3.67E+02

NRC DISTRIBUTION FOR PART 50 DOCKET MATERIAL

TO: NRC		FROM: Yankee Atomic Elec Co Westborough, Massachusetts 01581 R. H. Groce		DATE OF DOCUMENT 09/15/77
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DESCRIPTION	Furnishing information on review of NRC Summary of Commercial Nuclear Power Plant Effluents and advising certain differences regarding uniform treatment of less-than () values...	ENCLOSURE	Consists of summary tables for each plant consisting of two columns, one including less than values and the other not including less-than values. And consists of preliminary summary sheets with additional marginal notes...
TRANS	The Following:		

PLANT NAME: YANKEE ROWE
VERTMONT YANKEE
MAIN YANKEE
jcm 09/22/77

FOR ACTION/INFORMATION

BRANCH CHIEF: SCHWENGER (7) ✓ REID (9)
PROJECT MANAGER: _____
LIC. ASST: (5) **
**FOR DISTRIBUTION AS FOLLOWS:
1 EACH TO EPA HQS. EPA REGION, NOAA, F & W, S F & D

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TIC
NSIC
ACRS W/1 CY SENT AS CATEGORY B

CONTROL NUM

272650