CCNPP3COLA PEmails

From: Quinn, Laura
Sent: Tuesday, May 26, 2009 9:04 AM
To: Williamson, Alicia; Kugler, Andrew; Mussatti, Daniel; Fuller, Edward; Weiss, Eric; Cicotte, George; Stirewalt, Gerry; Nash, Harriet; Jones, Henry; Cushing, Jack; Biggins, James; Shepherd, James; Brand, Javier; Lee, Jay; Caverly, Jill; Cook, John; Dusaniwskyj, Michael; Mazaika, Michael; Hart, Michelle; Tiruneh, Nebiyu; Garcia-Santos, Norma; Emch, Richard; Bernal, Sara; Tammara, Seshagiri; Echols, Stan; Fredrichs, Thomas; corey.duberstein@pnl.gov; Elaine Chapman; lance.vail@pnl.gov; Lissa Staven; maryann.parkhurst@pnl.gov; Michelle Niemeyer; Mike Fayer (mike.fayer@pnl.gov); paul.hendrickson@pnl.gov; Philip M Daling; roy.kropp@pnl.gov; Tara O'neil; Van Ramsdell
Attachments: ML0914104320.pdf

Here is the latest RAI response from UniStar regarding the DBA source terms and the national waste policy act.
Thanks
Laura

Hearing Identifier: CalvertCliffs_Unit3Cola_Public_EX
Email Number: 767

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Subject:
Sent Date: 5/26/2009 9:03:38 AM
Received Date: 5/26/2009 9:03:00 AM
From: Quinn, Laura

Created By: Laura.Quinn@nrc.gov

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Options
Priority: Standard
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Recipients Received:

Greg Gibson
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UniStar
NUCLEAR ENERGY

10 CFR 50.4
10 CFR 52.79

May 19, 2009

UN#09-220

ATTN: Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Subject: UniStar Nuclear Energy, NRC Docket No. 52-016
Calvert Cliffs Nuclear Power Plant, Unit 3
RAI No. 1012, Design Basis Accidents
RAI No. 1013, Nuclear Waste Policy Act Status

References:
1) Laura Quinn (NRC) to Greg Gibson (UniStar Nuclear Energy), Request for Additional Information Related to the Environmental Report for the Calvert Cliffs Combined License Application – Design Basis Accident Source Terms and Nuclear Waste Policy Act Status, dated April 22, 2009.

2) Letter UN#08-039, Greg Gibson (UniStar Nuclear Energy) to Document Control Desk (NRC), Submittal of Updated Response to Calvert Cliffs Nuclear Power Plant, Unit 3 Environmental RAI, dated September 30, 2008.

The purpose of this letter is to respond to the requests for additional information (RAIs) identified in NRC letter to UniStar Nuclear Energy, dated April 22, 2009 (Reference 1). RAI No. 1012 addresses Design Basis Accidents as discussed in Section 7.1 of the Environmental Report (ER), as submitted in Part 3 of the Calvert Cliffs Nuclear Power Plant (CCNPP) Unit 3 Combined License Application (COLA), Revision 4. RAI No. 1012 is related to the UniStar Nuclear Energy environmental RAI response No. 147 (Reference 2). RAI No. 1013 involves a Nuclear Waste Policy Act question for ER Section 1.3, "Status of Reviews, Approval, and Consultations."

D096
NRO

The enclosure provides our responses to RAI No. 1012 and RAI No. 1013. A Licensing Basis Document Change Request has been initiated to incorporate the changes into a future revision of the CCNPP Unit 3 COLA. This response does not include any new regulatory commitments.

If there are any questions regarding this transmittal, please contact me at (410) 470-4205, or Mr. Dimitri Lutchenkov at (410) 470-5524.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on May 19, 2009

Greg Gibson

Enclosure: Responses to NRC Requests for Additional Information
RAI No. 1012, Design Basis Accidents
RAI No. 1013, Nuclear Waste Policy Act Status, Calvert Cliffs Nuclear Power Plant Unit 3

cc: John Rycyna, NRC Project Manager, U.S. EPR COL Application
Laura Quinn, NRC Environmental Project Manager, U.S. EPR COL Application
Getachew Tesfaye, NRC Project Manager, U.S. EPR DC Application (w/o enclosure)
Loren Plisco, Deputy Regional Administrator, NRC Region II (w/o enclosure)
Silas Kennedy, U.S. NRC Resident Inspector, CCNPP, Units 1 and 2
U.S. NRC Region I Office

GTG/FRP/jmm

Enclosure
Responses to NRC Requests for Additional Information
RAI No. 1012, Design Basis Accidents
RAI No. 1013, Nuclear Waste Policy Act Status
Calvert Cliffs Nuclear Power Plant Unit 3

RAI No 1012

Background: Environmental Standard Review Plan NUREG-1555, Section 7.1, Design Basis Accidents (DBA), directs the staff to review the applicant's calculated dose consequences presented in the environmental report (ER). The staff also performs a safety review of the dose consequences presented in the applicant's Final Safety Analysis Report (FSAR). The source terms presented in your ER should be consistent with your FSAR for the corresponding accidents. DBA source terms used in the ER are provided in UniStar's environmental RAI response No.147 dated June 12, 2008. However, the source terms provided in RAI response No.147 for the Locked Rotor, Rod Ejection, and Main Steam Line Break accidents are inconsistent with the doses listed for those accidents in the U.S. EPR FSAR (DCD) submitted to the NRC on December 11, 2007, that are incorporated by reference in the COL FSAR.

Provide updated analyses that resolve the inconsistencies noted below:

1) The Locked Rotor accident source term in the RAI response No.147 postulates 8% clad failure. However, the DCD Tier 2 section 15.0.3.8 presents dose estimates for 9.5% clad failure.

2) The Rod Ejection accident source term in the RAI response No.147 postulates 26% clad failure. However, the DCD Tier 2 Table 15.0-44 and Section 15.0.3.9 presents dose estimates for 36.7% clad failure.

3) RAI response No.147 provides source terms for the Main Steam Line Break (MSLB) accident that are inconsistent with the DCD. The differences are (a) the ER includes a source term for the MSLB with 1.24% clad failure, but the DCD does not analyze this case; and (b) the DCD in Tier 2 Section 15.0.3.7 and Table 15.0-34 analyzes the MSLB with 3.3% clad failure and 0.58% full-rod fuel melt, but the ER does not provide source terms for these cases.

Response

The listed atmospheric releases for the Steam System Piping Failure (Table 7.1-16), Pump Locked Rotor Accident (Table 7.1-17) and Rod Ejection Accident (Table 7.1-23), with clad failure and fuel overheat (as applicable), have been revised to correspond to the DBA scenarios in US EPR FSAR Chapter 15.0 with maximized fuel damage selected to yield 90% of the dose acceptance criterion at the critical receptor.

The isotope activity release tables from NRC RAI No. 147 were previously incorporated in ER Section 7.1 of CCNPP Unit 3 COLA, Revision 4. These isotope activity release tables have now been modified using coolant source activity assumptions consistent with those used in the U.S. EPR Design Control Document (DCD). Revised activity results are provided below for the CCNPP Unit 3 ER Section 7.1.

COLA Impact

ER Section 7.1 will be updated as follows in a future COLA revision:

Table 7.1-6—{Steam System Piping Failure}

Time	Site TEDE Dose (rem/Sv)	
	EAB	LPZ
Pre-Existing Iodine Spike		
0-2 hr	1.96E-02/1.96E-04	3.71E-03/3.71E-05
2-8 hr		1.58E-03/1.58E-05
8-24 hr		9.10E-05/9.10E-05
24-96 hr		0.00E+00/0.00E+00
96-720 hr		0.00E+00/0.00E+00
Total	1.96E-02/1.96E-04	5.38E-03/5.38E-05
Limit	25/0.25	25/0.25
Accident-Initiated Iodine Spike		
0-2 hr	2.17E-02/2.17E-04	4.11E-03/4.11E-05
2-8 hr		1.25E-02/1.25E-04
8-24 hr		1.30E-03/1.30E-05
24-96 hr		0.00E+00/0.00E+00
96-720 hr		0.00E+00/0.00E+00
Total	3.3 2.17E-02/2.17E-04	1.80E-02/1.80E-04
Limit	2.5/0.025	2.5/0.025
Accidental-Induced ~~1.24~~% Fuel Rod Clad Failure		
0-2 hr	4.26E-01/4.26E-03 → ~~1.70E-01/1.70E-03~~	8.05E-02/8.05E-04 → ~~3.21E-02/3.21E-04~~
2-8 hr		1.41E-01/1.41E-03 → ~~5.30E-02/5.30E-04~~
8-24 hr		8.62E-03/8.62E-05 → ~~3.24E-03/3.24E-05~~
24-96 hr		0.00E+00/0.00E+00 → ~~0.00E+00/0.00E+00~~
96-720 hr		0.00E+00/0.00E+00 → ~~0.00E+00/0.00E+00~~
Total	4.26E-01/4.26E-03 → ~~1.70E-01/1.70E-03~~	2.30E-01/2.30E-03 → ~~8.83E-02/8.83E-04~~
Limit	25/0.25	25/0.25

Note: Replace numbers in cloud with numbers in box to left.

Append table with the following:

Accident-Induced 0.58% Fuel Overheat		
0-2 hr	4.72E-01/4.72E-03	8.92E-02/8.92E-04
2-8 hr		1.44E-01/1.44E-03
8-24 hr		8.47E-03/8.47E-05
24-96 hr		0.00E+00/0.00E+00
96-720 hr		0.00E+00/0.00E+00
Total	4.72E-01/4.72E-03	2.42E-01/2.42E-03
Limit	25/0.25	25/0.25

Table 7.1-7—{Reactor Coolant Pump Locked Rotor Accident / Broken Shaft}

Time	Site TEDE Dose (rem/Sv)	
	~~EAB~~	~~LPZ~~
0-2 hr	~~1.57E-01/1.57E-03~~	~~2.92E-02/2.92E-04~~
2-8 hr		~~3.48E-02/3.48E-04~~
8-24 hr		0.00E+00/0.00E+00
24-96 hr		0.00E+00/0.00E+00
96-720 hr		0.00E+00/0.00E+00
Total	~~1.57E-01/1.57E-03~~	~~6.39E-02/6.39E-04~~
Limit	~~25/0.25~~	~~25/0.25~~

Insert 7.1-7

Insert 7.1-7

1.82E-01 / 1.82E-03	3.43E-02 / 3.43E-04
	4.13E-02 / 4.13E-04
	0.00E+00 / 0.00E+00
	0.00E+00 / 0.00E+00
	0.00E+00 / 0.00E+00
1.82E-01 / 1.82E-03	7.56E-02 / 7.56E-04
2.5 / 0.025	2.5 / 0.025

Table 7.1-12—~~{~~Rod Ejection Accident~~}~~

Time	Site TEDE Dose (rem/Sv)	
	EAB	LPZ
0-2 hr	~~3.24E-01/3.24E-03~~	~~6.12E-02/6.12E-04~~
2-8 hr		~~1.55E-01/1.55E-03~~
8-24 hr	4.57E-01/4.57E-03	0.00E+00/0.00E+00
24-96 hr		0.00E+00/0.00E+00
96-720 hr		0.00E+00/0.00E+00
Total	~~3.24E-01/3.24E-03~~	~~2.16E-01/2.16E-03~~
Limit	6.3/0.063	6.3/0.063

4.57E-01/4.57E-03

2.19E-01/2.19E-03

8.63E-02/8.63E-04

3.05E-01/3.05E-03

Table 7.1-13—{Summary of DBA Radiological Consequences of Offsite Receptors Form CCNPP Unit 3}

Design Basis Accident	EAB TEDE Dose(rem / ~~Sieverts~~) Sv	LPZ TEDE Dose(rem / ~~Sieverts~~) Sv	Regulatory TEDE Dose Acceptance Criteria[b] (rem / ~~Sieverts~~) Sv
Steam System Piping Failures			
Pre-accident Iodine Spike	2.0E-02/2.0E-04	5.4E-03/5.4E-05	25 / 0.25
Concurrent Iodine Spike	2.2E-02/2.2E-04	1.8/1.8E-04	2.5 / 0.025
~~1.24% Fuel Rod Clad Failure~~	~~1.7E-01/1.7E-03~~	~~8.8E-01/8.8E-03~~	~~25 / 0.25~~
Reactor Coolant Pump Locked Rotor Accident / Broken Shaft (~~8%~~ clad failure)	~~1.5E-01/1.5E-03~~ 9.5	~~6.4E-02/6.4E-04~~ 1.8E-01/1.8E-03	2.5 / 0.025 7.6E-02/7.6E-04
Failure of Small Lines Carrying Primary Coolant Outside Containment	1.5E-01/1.5E-03	2.8E-02/2.8E-04	2.5 / 0.025
Steam Generator Tube Rupture		1.0E+00/1.0E-02	
Pre-accident Iodine Spike	8.9E-01/8.9E-03	2.9E-02/2.9E-04	25 / 0.25
Concurrent Iodine Spike	5.9E-01/5.9E-03	7.0E-02/7.0E-04	2.5 / 0.025
LOCA	~~1.10E+00/1.10E-02~~	1.1E+00/1.1E-02	25 / 0.25
Fuel Handling Accident	4.5E-01/4.5E-03	9.0E-02/9.0E-04	6.3 / 0.063
Rod Ejection Accident	~~3.2E-01/3.2E-03~~	~~2.2E-01/2.2E-03~~ 4.6E-01/4.6E-03	6.3 / 0.063 3.1E-01/3.1E-03

Key:
EAB – Exclusion Area Boundary
LPZ – Low Population Zone
TEDE – Total effective dose equivalent (36.7% clad failure)

0.58% Fuel Overheat	4.7E-01/4.7E-03	2.4E-01/2.4E-03	25/0.25
3.3% Fuel Rod Clad Failure	4.3E-01/4.3E-03	2.3E-01/2.3E-03	25/0.25

Insert 7.1-16a

3.3

and 0.58% Fuel Overheat

Table 7.1-16—Radionuclide Releases to Atmosphere for Main Steam Line Break with Accident-Induced ~~1.24~~% Clad Failure

(Page 1 of 2)

Nuclide	Releases to Atmosphere During Specified Time Intervals (hrs)							
	0 to 2		2 to 8		8 to 24		Total	
	Ci	Bq	Ci	Bq	Ci	Bq	Ci	Bq
~~Kr-83m~~	~~1.23E+01~~	~~4.566E+11~~	~~1.339E+01~~	~~4.954E+11~~	~~4.654E-01~~	~~1.722E+10~~	~~2.619E+01~~	~~9.690E+11~~
~~Kr-85m~~	~~3.18E+01~~	~~1.177E+12~~	~~5.299E+01~~	~~1.961E+12~~	~~1.250E+00~~	~~4.625E+10~~	~~8.604E+01~~	~~3.183E+12~~
~~Kr-85~~	~~4.63E+00~~	~~1.712E+11~~	~~1.388E+01~~	~~5.136E+11~~	~~5.781E-01~~	~~2.139E+10~~	~~1.908E+01~~	~~7.060E+11~~
~~Kr-87~~	~~4.48E+01~~	~~1.659E+12~~	~~2.183E+01~~	~~8.077E+11~~	~~9.054E-02~~	~~3.350E+09~~	~~6.675E+01~~	~~2.470E+12~~
~~Kr-88~~	~~8.29E+01~~	~~3.066E+12~~	~~1.011E+02~~	~~3.741E+12~~	~~1.647E+00~~	~~6.094E+10~~	~~1.857E+02~~	~~6.871E+12~~
~~Kr-89~~	~~5.01E+00~~	~~1.853E+11~~	~~2.014E-11~~	~~7.452E-01~~	~~3.276E-46~~	~~1.212E-35~~	~~5.007E+00~~	~~1.853E+11~~
~~Xe-131m~~	~~1.50E+00~~	~~5.546E+10~~	~~4.467E+00~~	~~1.653E+11~~	~~1.887E-01~~	~~6.982E+09~~	~~6.154E+00~~	~~2.277E+11~~
~~Xe-133m~~	~~7.50E+00~~	~~2.775E+11~~	~~2.160E+01~~	~~7.992E+11~~	~~9.244E-01~~	~~3.420E+10~~	~~3.002E+01~~	~~1.111E+12~~
~~Xe-133~~	~~2.56E+02~~	~~9.483E+12~~	~~7.562E+02~~	~~2.798E+13~~	~~3.187E+01~~	~~1.179E+12~~	~~1.044E+03~~	~~3.863E+13~~
~~Xe-135m~~	~~1.56E+01~~	~~5.776E+11~~	~~1.737E+01~~	~~6.427E+11~~	~~1.804E+00~~	~~6.675E+10~~	~~3.479E+01~~	~~1.287E+12~~
~~Xe-135~~	~~7.55E+01~~	~~2.795E+12~~	~~2.021E+02~~	~~7.478E+12~~	~~1.331E+01~~	~~4.925E+11~~	~~2.910E+02~~	~~1.077E+13~~
~~Xe-137~~	~~9.45E+00~~	~~3.497E+11~~	~~3.495E-09~~	~~1.293E+02~~	~~4.426E-38~~	~~1.638E-27~~	~~9.450E+00~~	~~3.497E+11~~
~~Xe-138~~	~~3.39E+01~~	~~1.254E+12~~	~~9.589E-02~~	~~3.548E+09~~	~~5.105E-10~~	~~1.889E+01~~	~~3.398E+01~~	~~1.257E+12~~
~~Br-83~~	~~4.27E+00~~	~~1.579E+11~~	~~3.443E+00~~	~~1.274E+11~~	~~1.707E-01~~	~~6.316E+09~~	~~7.881E+00~~	~~2.916E+11~~
~~Br-84~~	~~4.05E+00~~	~~1.497E+11~~	~~2.171E-01~~	~~8.033E+09~~	~~5.883E-05~~	~~2.177E+06~~	~~4.262E+00~~	~~1.577E+11~~
~~Br-85~~	~~6.25E-01~~	~~2.313E+10~~	~~8.120E-14~~	~~3.004E-03~~	~~1.228E-51~~	~~4.544E-41~~	~~6.252E-01~~	~~2.313E+10~~
~~I-129~~	~~2.90E-06~~	~~1.074E+05~~	~~5.616E-06~~	~~2.078E+05~~	~~8.492E-07~~	~~3.142E+04~~	~~9.369E-06~~	~~3.467E+05~~
~~I-130~~	~~3.92E+00~~	~~1.452E+11~~	~~6.706E+00~~	~~2.481E+11~~	~~8.338E-01~~	~~3.085E+10~~	~~1.146E+01~~	~~4.240E+11~~
~~I-131~~	~~6.93E+01~~	~~2.563E+12~~	~~1.468E+02~~	~~5.432E+12~~	~~2.198E+01~~	~~8.133E+11~~	~~2.380E+02~~	~~8.806E+12~~
~~I-132~~	~~4.43E+01~~	~~1.640E+12~~	~~3.363E+01~~	~~1.244E+12~~	~~1.588E+00~~	~~5.876E+10~~	~~7.955E+01~~	~~2.943E+12~~
~~I-133~~	~~9.13E+01~~	~~3.377E+12~~	~~1.655E+02~~	~~6.124E+12~~	~~2.231E+01~~	~~8.255E+11~~	~~2.791E+02~~	~~1.033E+13~~
~~I-134~~	~~4.73E+01~~	~~1.751E+12~~	~~8.856E+00~~	~~3.277E+11~~	~~4.002E-02~~	~~1.481E+09~~	~~5.623E+01~~	~~2.081E+12~~
~~I-135~~	~~7.31E+01~~	~~2.704E+12~~	~~1.083E+02~~	~~4.007E+12~~	~~1.126E+01~~	~~4.166E+11~~	~~1.926E+02~~	~~7.126E+12~~
~~Rb-86m~~	~~6.63E-04~~	~~2.453E+07~~	~~1.126E-39~~	~~4.166E-29~~	~~0.000E+00~~	~~0.000E+00~~	~~6.630E-04~~	~~2.453E+07~~
~~Rb-86~~	~~3.59E-01~~	~~1.329E+10~~	~~9.232E-01~~	~~3.416E+10~~	~~1.396E-01~~	~~5.165E+09~~	~~1.422E+00~~	~~5.261E+10~~
~~Rb-88~~	~~9.05E+01~~	~~3.350E+12~~	~~1.129E+02~~	~~4.177E+12~~	~~1.838E+00~~	~~6.801E+10~~	~~2.052E+02~~	~~7.592E+12~~
~~Rb-89~~	~~3.11E+01~~	~~1.150E+12~~	~~9.210E-02~~	~~3.408E+09~~	~~4.812E-09~~	~~1.780E+02~~	~~3.116E+01~~	~~1.153E+12~~
~~Cs-134~~	~~4.03E+01~~	~~1.490E+12~~	~~1.041E+02~~	~~3.852E+12~~	~~1.582E+01~~	~~5.853E+11~~	~~1.602E+02~~	~~5.927E+12~~
~~Cs-136~~	~~9.98E+00~~	~~3.693E+11~~	~~2.558E+01~~	~~9.465E+11~~	~~3.858E+00~~	~~1.427E+11~~	~~3.942E+01~~	~~1.459E+12~~
~~Cs-137~~	~~1.54E+01~~	~~5.687E+11~~	~~3.975E+01~~	~~1.471E+12~~	~~6.041E+00~~	~~2.235E+11~~	~~6.116E+01~~	~~2.263E+12~~
~~Cs-138~~	~~1.01E+02~~	~~3.748E+12~~	~~8.553E+00~~	~~3.165E+11~~	~~1.560E-03~~	~~5.772E+07~~	~~1.099E+02~~	~~4.066E+12~~

3.3

and 0.58% Fuel Overheat

Table 7.1-16—Radionuclide Releases to Atmosphere for Main Steam Line Break with Accident-Induced ~~1.24~~% Clad Failure

(Page 2 of 2)

Nuclide	Releases to Atmosphere During Specified Time Intervals (hrs)							
	0 to 2		2 to 8		8 to 24		Total	
	Ci	Bq	Ci	Bq	Ci	Bq	Ci	Bq
~~Sr-89~~	~~2.07E-02~~	~~7.644E+08~~	~~7.312E-02~~	~~2.705E+09~~	~~9.210E-03~~	~~3.408E+08~~	~~1.030E-01~~	~~3.811E+09~~
~~Ba-137m~~	~~1.45E+01~~	~~5.380E+11~~	~~3.760E+01~~	~~1.391E+12~~	~~5.714E+00~~	~~2.114E+11~~	~~5.785E+01~~	~~2.140E+12~~
~~Total~~	~~1.22E+03~~	~~4.525E+13~~	~~2.008E+03~~	~~7.430E+13~~	~~1.437E+02~~	~~5.317E+12~~	~~3.375E+03~~	~~1.249E+14~~

Insert 7.1-16a

Kr-83m	3.280E+01	1.214E+12	3.559E+01	1.317E+12	1.238E+00	4.581E+10	6.963E+01	2.576E+12
Kr-85m	8.444E+01	3.124E+12	1.407E+02	5.206E+12	3.320E+00	1.228E+11	2.285E+02	8.455E+12
Kr-85	1.031E+01	3.815E+11	3.093E+01	1.144E+12	1.288E+00	4.766E+10	4.253E+01	1.574E+12
Kr-87	1.192E+02	4.410E+12	5.806E+01	2.148E+12	2.408E-01	8.910E+09	1.775E+02	6.568E+12
Kr-88	2.202E+02	8.147E+12	2.688E+02	9.946E+12	4.376E+00	1.619E+11	4.934E+02	1.826E+13
Kr-89	1.332E+01	4.928E+11	5.359E-11	1.983E+00	8.719E-46	3.226E-35	1.332E+01	4.928E+11
Xe-131m	3.583E+00	1.326E+11	1.068E+01	3.952E+11	4.523E-01	1.674E+10	1.472E+01	5.446E+11
Xe-133m	1.946E+01	7.200E+11	5.604E+01	2.073E+12	2.403E+00	8.891E+10	7.790E+01	2.882E+12
Xe-133	6.466E+02	2.392E+13	1.908E+03	7.060E+13	8.055E+01	2.980E+12	2.635E+03	9.750E+13
Xe-135m	4.150E+01	1.536E+12	4.615E+01	1.708E+12	4.800E+00	1.776E+11	9.245E+01	3.421E+12
Xe-135	1.998E+02	7.393E+12	5.351E+02	1.980E+13	3.532E+01	1.307E+12	7.702E+02	2.850E+13
Xe-137	2.515E+01	9.306E+11	9.302E-09	3.442E+02	1.178E-37	4.359E-27	2.515E+01	9.306E+11
Xe-138	9.017E+01	3.336E+12	2.552E-01	9.442E+09	1.358E-09	5.025E+01	9.042E+01	3.346E+12
Br-83	1.094E+01	4.048E+11	9.155E+00	3.387E+11	4.542E-01	1.681E+10	2.055E+01	7.604E+11
Br-84	1.069E+01	3.955E+11	5.777E-01	2.137E+10	1.566E-04	5.794E+06	1.126E+01	4.166E+11
Br-85	1.663E+00	6.153E+10	2.161E-13	7.996E-03	3.269E-51	1.210E-40	1.663E+00	6.153E+10
I-129	6.476E-06	2.396E+05	1.488E-05	5.506E+05	2.258E-06	8.355E+04	2.362E-05	8.739E+05
I-130	9.312E+00	3.445E+11	1.780E+01	6.586E+11	2.217E+00	8.203E+10	2.933E+01	1.085E+12
I-131	1.643E+02	6.079E+12	3.897E+02	1.442E+13	5.846E+01	2.163E+12	6.125E+02	2.266E+13
I-132	1.121E+02	4.148E+12	8.941E+01	3.308E+12	4.225E+00	1.563E+11	2.057E+02	7.611E+12

Insert 7.1-16a (continued)

I-133	2.124E+02	7.859E+12	4.391E+02	1.625E+13	5.933E+01	2.195E+12	7.109E+02	2.630E+13
I-134	1.242E+02	4.595E+12	2.356E+01	8.717E+11	1.065E-01	3.941E+09	1.479E+02	5.472E+12
I-135	1.789E+02	6.619E+12	2.877E+02	1.064E+13	2.996E+01	1.109E+12	4.966E+02	1.837E+13
Rb-86m	1.764E-03	6.527E+07	2.996E-39	1.109E-28	0.000E+00	0.000E+00	1.764E-03	6.527E+07
Rb-86	9.539E-01	3.529E+10	2.456E+00	9.087E+10	3.714E-01	1.374E+10	3.781E+00	1.399E+11
Rb-88	2.406E+02	8.902E+12	2.999E+02	1.110E+13	4.885E+00	1.807E+11	5.454E+02	2.018E+13
Rb-89	8.269E+01	3.060E+12	2.451E-01	9.069E+09	1.281E-08	4.740E+02	8.293E+01	3.068E+12
Cs-134	1.069E+02	3.955E+12	2.768E+02	1.024E+13	4.209E+01	1.557E+12	4.258E+02	1.575E+13
Cs-136	2.650E+01	9.805E+11	6.805E+01	2.518E+12	1.026E+01	3.796E+11	1.048E+02	3.878E+12
Cs-137	4.081E+01	1.510E+12	1.057E+02	3.911E+12	1.607E+01	5.946E+11	1.626E+02	6.016E+12
Cs-138	2.696E+02	9.975E+12	2.276E+01	8.421E+11	4.151E-03	1.536E+08	2.923E+02	1.082E+13
Sr-89	5.497E-02	2.034E+09	1.946E-01	7.200E+09	2.451E-02	9.069E+08	2.741E-01	1.014E+10
Ba-137m	3.860E+01	1.428E+12	1.000E+02	3.700E+12	1.520E+01	5.624E+11	1.538E+02	5.691E+12
Total	3.138E+03	1.161E+14	5.224E+03	1.933E+14	3.776E+02	1.397E+13	8.739E+03	3.233E+14

Insert 7.1-16a (continued)

Kr-83m	1.098E+02	4.063E+12	1.038E+02	3.841E+12	2.549E+00	9.431E+10	2.162E+02	7.999E+12
Kr-85m	2.957E+02	1.094E+13	4.928E+02	1.823E+13	1.158E+01	4.285E+11	8.001E+02	2.960E+13
Kr-85	1.721E+01	6.368E+11	5.163E+01	1.910E+12	2.150E+00	7.955E+10	7.099E+01	2.627E+12
Kr-87	4.179E+02	1.546E+13	2.035E+02	7.530E+12	8.440E-01	3.123E+10	6.223E+02	2.303E+13
Kr-88	7.737E+02	2.863E+13	9.445E+02	3.495E+13	1.537E+01	5.687E+11	1.733E+03	6.412E+13
Kr-89	4.684E+01	1.733E+12	1.884E-10	6.971E+00	3.065E-45	1.134E-34	4.684E+01	1.733E+12
Xe-131m	1.197E+01	4.429E+11	3.560E+01	1.317E+12	1.483E+00	5.487E+10	4.905E+01	1.815E+12
Xe-133m	6.769E+01	2.505E+12	1.938E+02	7.171E+12	8.011E+00	2.964E+11	2.695E+02	9.972E+12
Xe-133	2.213E+03	8.188E+13	6.514E+03	2.410E+14	2.708E+02	1.002E+13	8.997E+03	3.329E+14
Xe-135m	1.112E+02	4.114E+12	8.124E+01	3.006E+12	8.435E+00	3.121E+11	2.008E+02	7.430E+12
Xe-135	6.807E+02	2.519E+13	1.677E+03	6.205E+13	8.537E+01	3.159E+12	2.443E+03	9.039E+13
Xe-137	8.839E+01	3.270E+12	3.271E-08	1.210E+03	4.140E-37	1.532E-26	8.839E+01	3.270E+12
Xe-138	3.178E+02	1.176E+13	8.992E-01	3.327E+10	4.786E-09	1.771E+02	3.187E+02	1.179E+13
Br-83	1.904E+01	7.045E+11	1.609E+01	5.953E+11	7.982E-01	2.953E+10	3.592E+01	1.329E+12
Br-84	1.875E+01	6.938E+11	1.015E+00	3.756E+10	2.752E-04	1.018E+07	1.976E+01	7.311E+11
Br-85	2.922E+00	1.081E+11	3.798E-13	1.405E-02	5.745E-51	2.126E-40	2.922E+00	1.081E+11
I-129	1.081E-05	4.000E+05	2.613E-05	9.668E+05	3.967E-06	1.468E+05	4.091E-05	1.514E+06
I-130	1.585E+01	5.865E+11	3.127E+01	1.157E+12	3.897E+00	1.442E+11	5.102E+01	1.888E+12
I-131	1.792E+02	6.630E+12	4.277E+02	1.582E+13	6.411E+01	2.372E+12	6.709E+02	2.482E+13
I-132	1.943E+02	7.189E+12	1.571E+02	5.813E+12	7.425E+00	2.747E+11	3.588E+02	1.328E+13

Insert 7.1-16a (continued)

I-133	3.595E+02	1.330E+13	7.712E+02	2.853E+13	1.043E+02	3.859E+12	1.235E+03	4.570E+13
I-134	2.175E+02	8.048E+12	4.141E+01	1.532E+12	1.872E-01	6.926E+09	2.591E+02	9.587E+12
I-135	3.073E+02	1.137E+13	5.054E+02	1.870E+13	5.265E+01	1.948E+12	8.654E+02	3.202E+13
Rb-86m	1.290E-03	4.773E+07	2.191E-39	8.107E-29	0.000E+00	0.000E+00	1.290E-03	4.773E+07
Rb-86	7.010E-01	2.594E+10	1.804E+00	6.675E+10	2.727E-01	1.009E+10	2.777E+00	1.027E+11
Rb-88	6.770E+02	2.505E+13	1.053E+03	3.896E+13	1.716E+01	6.349E+11	1.747E+03	6.464E+13
Rb-89	9.740E+01	3.604E+12	3.763E-01	1.392E+10	1.278E-08	4.729E+02	9.778E+01	3.618E+12
Cs-134	7.845E+01	2.903E+12	2.031E+02	7.515E+12	3.087E+01	1.142E+12	3.124E+02	1.156E+13
Cs-136	1.947E+01	7.204E+11	4.995E+01	1.848E+12	7.537E+00	2.789E+11	7.696E+01	2.848E+12
Cs-137	2.990E+01	1.106E+12	7.740E+01	2.864E+12	1.177E+01	4.355E+11	1.191E+02	4.407E+12
Cs-138	4.164E+02	1.541E+13	5.014E+01	1.855E+12	5.701E-03	2.109E+08	4.666E+02	1.726E+13
Sr-89	7.331E-02	2.712E+09	2.692E-01	9.960E+09	2.321E-02	8.588E+08	3.657E-01	1.353E+10
Ba-137m	2.829E+01	1.047E+12	7.327E+01	2.711E+12	1.113E+01	4.118E+11	1.127E+02	4.170E+12
Total	7.814E+03	2.891E+14	1.376E+04	5.091E+14	7.187E+02	2.659E+13	2.229E+04	8.247E+14

Table 7.1-17—Radionuclide Releases to Atmosphere for Pump Locked Rotor Accident (LRA) with Accident-Induced ~~8.0~~ 9.5% Clad Failure

Insert 7.1-17

Nuclide	Releases to Atmosphere During Specified Time Intervals (hrs)					
	0 to 2		2 to 8		Total	
	Ci	Bq	Ci	Bq	Ci	Bq
Kr-83m	5.781E+01	2.139E+12	4.552E+01	1.684E+12	1.033E+02	3.822E+12
Kr-85m	1.604E+02	5.935E+12	2.552E+02	9.442E+12	4.156E+02	1.538E+13
Kr-85	1.822E+01	6.741E+11	5.241E+01	1.939E+12	7.063E+01	2.613E+12
Kr-87	2.309E+02	8.543E+12	1.056E+02	3.907E+12	3.365E+02	1.245E+13
Kr-88	4.212E+02	1.558E+13	4.890E+02	1.809E+13	9.102E+02	3.368E+13
Kr-89	3.203E+01	1.185E+12	9.752E-11	3.608E+00	3.203E+01	1.185E+12
Xe-131m	6.515E+00	2.411E+11	1.857E+01	6.871E+11	2.509E+01	9.283E+11
Xe-133m	3.645E+01	1.349E+12	9.966E+01	3.687E+12	1.361E+02	5.036E+12
Xe-133	1.201E+03	4.444E+13	3.385E+03	1.252E+14	4.585E+03	1.696E+14
Xe-135m	4.917E+01	1.819E+12	9.850E+00	3.645E+11	5.902E+01	2.184E+12
Xe-135	3.604E+02	1.333E+13	7.953E+02	2.943E+13	1.156E+03	4.277E+13
Xe-137	6.002E+01	2.221E+12	1.694E-08	6.268E+02	6.002E+01	2.221E+12
Xe-138	1.927E+02	7.130E+12	4.645E-01	1.719E+10	1.931E+02	7.145E+12
Br-83	3.612E+00	1.336E+11	1.721E+00	6.368E+10	5.333E+00	1.973E+11
Br-84	5.315E+00	1.967E+11	7.391E-02	2.735E+09	5.389E+00	1.994E+11
Br-85	1.964E+00	7.267E+10	2.103E-14	7.781E-04	1.964E+00	7.267E+10
I-129	1.995E-06	7.382E+04	3.356E-06	1.242E+05	5.352E-06	1.980E+05
I-130	2.843E+00	1.052E+11	3.859E+00	1.428E+11	6.702E+00	2.480E+11
I-131	4.887E+01	1.808E+12	8.686E+01	3.214E+12	1.357E+02	5.021E+12
I-132	3.739E+01	1.383E+12	1.672E+01	6.186E+11	5.410E+01	2.002E+12
I-133	6.484E+01	2.399E+12	9.667E+01	3.577E+12	1.615E+02	5.976E+12
I-134	5.113E+01	1.892E+12	3.473E+00	1.285E+11	5.460E+01	2.020E+12
I-135	5.503E+01	2.036E+12	6.044E+01	2.236E+12	1.155E+02	4.274E+12
Rb-86m	2.139E-03	7.914E+07	2.855E-40	1.056E-29	2.139E-03	7.914E+07
Rb-86	2.655E-01	9.824E+09	5.398E-01	1.997E+10	8.053E-01	2.980E+10
Rb-88	3.718E+02	1.376E+13	5.449E+02	2.016E+13	9.167E+02	3.392E+13
Rb-89	7.557E+01	2.796E+12	1.480E-01	5.476E+09	7.572E+01	2.802E+12
Cs-134	2.971E+01	1.099E+12	6.089E+01	2.253E+12	9.061E+01	3.353E+12
Cs-136	7.377E+00	2.729E+11	1.495E+01	5.532E+11	2.232E+01	8.258E+11
Cs-137	1.134E+01	4.196E+11	2.325E+01	8.603E+11	3.460E+01	1.280E+12
Cs-138	2.418E+02	8.947E+12	2.320E+01	8.584E+11	2.650E+02	9.805E+12
Sr-89	2.770E-02	1.025E+09	1.157E-01	4.281E+09	1.434E-01	5.306E+09
Ba-137m	8.491E+00	3.142E+11	2.200E+01	8.140E+11	3.049E+01	1.128E+12
Total	3.844E+03	1.422E+14	6.216E+03	2.300E+14	1.006E+04	3.722E+14

Insert 7.1-17

Kr-83m	6.864E+01	2.540E+12	5.405E+01	2.000E+12	1.227E+02	4.540E+12
Kr-85m	1.905E+02	7.049E+12	3.030E+02	1.121E+13	4.935E+02	1.826E+13
Kr-85	2.146E+01	7.940E+11	6.173E+01	2.284E+12	8.319E+01	3.078E+12
Kr-87	2.742E+02	1.015E+13	1.254E+02	4.640E+12	3.996E+02	1.479E+13
Kr-88	5.001E+02	1.850E+13	5.806E+02	2.148E+13	1.081E+03	4.000E+13
Kr-89	3.803E+01	1.407E+12	1.158E-10	4.285E+00	3.803E+01	1.407E+12
Xe-131m	7.701E+00	2.849E+11	2.195E+01	8.122E+11	2.966E+01	1.097E+12
Xe-133m	4.324E+01	1.600E+12	1.182E+02	4.373E+12	1.615E+02	5.976E+12
Xe-133	1.423E+03	5.265E+13	4.010E+03	1.484E+14	5.433E+03	2.010E+14
Xe-135m	5.836E+01	2.159E+12	1.167E+01	4.318E+11	7.003E+01	2.591E+12
Xe-135	4.279E+02	1.583E+13	9.442E+02	3.494E+13	1.372E+03	5.076E+13
Xe-137	7.127E+01	2.637E+12	2.011E-08	7.441E+02	7.127E+01	2.637E+12
Xe-138	2.288E+02	8.466E+12	5.516E-01	2.041E+10	2.293E+02	8.484E+12
Br-83	4.263E+00	1.577E+11	2.041E+00	7.552E+10	6.304E+00	2.332E+11
Br-84	6.306E+00	2.333E+11	8.774E-02	3.246E+09	6.394E+00	2.366E+11
Br-85	2.332E+00	8.628E+10	2.497E-14	9.239E-04	2.332E+00	8.628E+10
I-129	2.293E-06	8.484E+04	3.969E-06	1.469E+05	6.262E-06	2.317E+05
I-130	3.307E+00	1.224E+11	4.570E+00	1.691E+11	7.877E+00	2.914E+11
I-131	5.682E+01	2.102E+12	1.029E+02	3.807E+12	1.597E+02	5.909E+12
I-132	4.404E+01	1.629E+12	1.982E+01	7.333E+11	6.386E+01	2.363E+12
I-133	7.514E+01	2.780E+12	1.144E+02	4.233E+12	1.896E+02	7.015E+12
I-134	6.060E+01	2.242E+12	4.122E+00	1.525E+11	6.472E+01	2.395E+12
I-135	6.439E+01	2.382E+12	7.163E+01	2.650E+12	1.360E+02	5.032E+12
Rb-86m	2.540E-03	9.398E+07	3.391E-40	1.255E-29	2.540E-03	9.398E+07
Rb-86	3.151E-01	1.166E+10	6.410E-01	2.372E+10	9.561E-01	3.538E+10
Rb-88	4.415E+02	1.634E+13	6.471E+02	2.394E+13	1.089E+03	4.029E+13
Rb-89	8.974E+01	3.320E+12	1.757E-01	6.501E+09	8.992E+01	3.327E+12
Cs-134	3.527E+01	1.305E+12	7.231E+01	2.675E+12	1.076E+02	3.981E+12
Cs-136	8.757E+00	3.240E+11	1.775E+01	6.568E+11	2.651E+01	9.809E+11
Cs-137	1.347E+01	4.984E+11	2.761E+01	1.022E+12	4.108E+01	1.520E+12
Cs-138	2.872E+02	1.063E+13	2.755E+01	1.019E+12	3.147E+02	1.164E+13
Sr-89	3.289E-02	1.217E+09	1.374E-01	5.084E+09	1.702E-01	6.297E+09
Ba-137m	1.008E+01	3.730E+11	2.612E+01	9.664E+11	3.620E+01	1.339E+12
Total	4.557E+03	1.686E+14	7.371E+03	2.727E+14	1.193E+04	4.414E+14

Table 7.1-23—Radionuclide Releases to Atmosphere for Rod Ejection Accident (REA) with Accident-Induced ~~26%~~ 36.7 Clad Failure

Insert 7.1-23

Nuclide	Releases to Atmosphere (Ci) During Specified Time Intervals (hrs)					
	0 to 2		2 to 8		Total	
	Ci	Bq	Ci	Bq	Ci	Bq
~~Kr-83m~~	~~4.713E+02~~	~~1.744E+13~~	~~3.879E+02~~	~~1.435E+13~~	~~8.592E+02~~	~~3.179E+13~~
~~Kr-85m~~	~~1.326E+03~~	~~4.906E+13~~	~~2.209E+03~~	~~8.173E+13~~	~~3.535E+03~~	~~1.308E+14~~
~~Kr-85~~	~~7.302E+01~~	~~2.702E+12~~	~~2.188E+02~~	~~8.096E+12~~	~~2.918E+02~~	~~1.080E+13~~
~~Kr-87~~	~~1.878E+03~~	~~6.949E+13~~	~~9.137E+02~~	~~3.381E+13~~	~~2.791E+03~~	~~1.033E+14~~
~~Kr-88~~	~~3.466E+03~~	~~1.282E+14~~	~~4.228E+03~~	~~1.564E+14~~	~~7.695E+03~~	~~2.847E+14~~
~~Kr-89~~	~~2.102E+02~~	~~7.777E+12~~	~~8.446E 10~~	~~3.125E+01~~	~~2.102E+02~~	~~7.777E+12~~
~~Xe-131m~~	~~5.278E+01~~	~~1.953E+12~~	~~1.566E+02~~	~~5.794E+12~~	~~2.094E+02~~	~~7.748E+12~~
~~Xe-133m~~	~~3.008E+02~~	~~1.113E+13~~	~~8.563E+02~~	~~3.168E+13~~	~~1.157E+03~~	~~4.281E+13~~
~~Xe-133~~	~~9.847E+03~~	~~3.643E+14~~	~~2.890E+04~~	~~1.069E+15~~	~~3.875E+04~~	~~1.434E+15~~
~~Xe-135m~~	~~3.493E+02~~	~~1.292E+13~~	~~6.359E+01~~	~~2.353E+12~~	~~4.129E+02~~	~~1.528E+13~~
~~Xe-135~~	~~2.976E+03~~	~~1.101E+14~~	~~6.805E+03~~	~~2.518E+14~~	~~9.781E+03~~	~~3.619E+14~~
~~Xe-137~~	~~3.971E+02~~	~~1.469E+13~~	~~1.468E 07~~	~~5.432E+03~~	~~3.971E+02~~	~~1.469E+13~~
~~Xe-138~~	~~1.423E+03~~	~~5.265E+13~~	~~4.026E+00~~	~~1.490E+11~~	~~1.427E+03~~	~~5.280E+13~~
~~Br-83~~	~~2.318E+00~~	~~8.577E+10~~	~~1.109E+01~~	~~4.103E+11~~	~~1.341E+01~~	~~4.962E+11~~
~~Br-84~~	~~1.340E+00~~	~~4.958E+10~~	~~4.784E 01~~	~~1.770E+10~~	~~1.818E+00~~	~~6.727E+10~~
~~Br-85~~	~~1.816E 02~~	~~6.719E+08~~	~~1.358E 13~~	~~5.025E 03~~	~~1.816E 02~~	~~6.719E+08~~
~~I-129~~	~~1.451E 06~~	~~5.369E+04~~	~~2.134E 05~~	~~7.896E+05~~	~~2.279E 05~~	~~8.432E+05~~
~~I-130~~	~~2.119E+00~~	~~7.840E+10~~	~~2.472E+01~~	~~9.146E+11~~	~~2.684E+01~~	~~9.931E+11~~
~~I-131~~	~~2.406E+01~~	~~8.902E+11~~	~~3.485E+02~~	~~1.289E+13~~	~~3.726E+02~~	~~1.379E+13~~
~~I-132~~	~~2.343E+01~~	~~8.669E+11~~	~~1.077E+02~~	~~3.985E+12~~	~~1.311E+02~~	~~4.851E+12~~
~~I-133~~	~~4.811E+01~~	~~1.780E+12~~	~~6.162E+02~~	~~2.280E+13~~	~~6.643E+02~~	~~2.458E+13~~
~~I-134~~	~~2.052E+01~~	~~7.592E+11~~	~~2.249E+01~~	~~8.321E+11~~	~~4.300E+01~~	~~1.591E+12~~
~~I-135~~	~~4.045E+01~~	~~1.497E+12~~	~~3.877E+02~~	~~1.434E+13~~	~~4.282E+02~~	~~1.584E+13~~
~~Rb-86m~~	~~3.435E 06~~	~~1.271E+05~~	~~9.253E 40~~	~~3.424E 29~~	~~3.435E 06~~	~~1.271E+05~~
~~Rb-86~~	~~1.192E 01~~	~~4.410E+09~~	~~1.756E+00~~	~~6.497E+10~~	~~1.876E+00~~	~~6.941E+10~~
~~Rb-88~~	~~2.836E+03~~	~~1.049E+14~~	~~4.711E+03~~	~~1.743E+14~~	~~7.548E+03~~	~~2.793E+14~~
~~Rb-89~~	~~2.112E+02~~	~~7.814E+12~~	~~1.177E+00~~	~~4.355E+10~~	~~2.124E+02~~	~~7.859E+12~~
~~Cs-134~~	~~1.337E+01~~	~~4.947E+11~~	~~1.981E+02~~	~~7.330E+12~~	~~2.114E+02~~	~~7.822E+12~~
~~Cs-136~~	~~3.309E+00~~	~~1.224E+11~~	~~4.861E+01~~	~~1.799E+12~~	~~5.192E+01~~	~~1.921E+12~~
~~Cs-137~~	~~5.096E+00~~	~~1.886E+11~~	~~7.554E+01~~	~~2.795E+12~~	~~8.064E+01~~	~~2.984E+12~~
~~Cs-138~~	~~1.250E+03~~	~~4.625E+13~~	~~1.935E+02~~	~~7.160E+12~~	~~1.443E+03~~	~~5.339E+13~~
~~Sr-89~~	~~1.940E 01~~	~~7.178E+09~~	~~8.238E 01~~	~~3.048E+10~~	~~1.018E+00~~	~~3.767E+10~~
~~Ba-137m~~	~~4.812E+00~~	~~1.780E+11~~	~~7.146E+01~~	~~2.644E+12~~	~~7.627E+01~~	~~2.822E+12~~
~~Total~~	~~2.726E+04~~	~~1.009E+15~~	~~5.156E+04~~	~~1.908E+15~~	~~7.882E+04~~	~~2.916E+15~~

Insert 7.1-23

Kr-83m	6.655E+02	2.462E+13	5.477E+02	2.026E+13	1.213E+03	4.488E+13
Kr-85m	1.872E+03	6.926E+13	3.118E+03	1.154E+14	4.990E+03	1.846E+14
Kr-85	1.026E+02	3.796E+12	3.074E+02	1.137E+13	4.100E+02	1.517E+13
Kr-87	2.651E+03	9.809E+13	1.290E+03	4.773E+13	3.941E+03	1.458E+14
Kr-88	4.894E+03	1.811E+14	5.970E+03	2.209E+14	1.086E+04	4.018E+14
Kr-89	2.967E+02	1.098E+13	1.193E-09	4.414E+01	2.967E+02	1.098E+13
Xe-131m	7.443E+01	2.754E+12	2.209E+02	8.173E+12	2.953E+02	1.093E+13
Xe-133m	4.246E+02	1.571E+13	1.209E+03	4.473E+13	1.633E+03	6.042E+13
Xe-133	1.390E+04	5.143E+14	4.078E+04	1.509E+15	5.467E+04	2.023E+15
Xe-135m	4.932E+02	1.825E+13	8.973E+01	3.320E+12	5.829E+02	2.157E+13
Xe-135	4.202E+03	1.555E+14	9.607E+03	3.555E+14	1.381E+04	5.110E+14
Xe-137	5.606E+02	2.074E+13	2.073E-07	7.670E+03	5.606E+02	2.074E+13
Xe-138	2.009E+03	7.433E+13	5.684E+00	2.103E+11	2.015E+03	7.456E+13
Br-83	3.270E+00	1.210E+11	1.566E+01	5.794E+11	1.893E+01	7.004E+11
Br-84	1.892E+00	7.000E+10	6.754E-01	2.499E+10	2.567E+00	9.498E+10
Br-85	2.564E-02	9.487E+08	1.917E-13	7.093E-03	2.564E-02	9.487E+08
I-129	2.042E-06	7.555E+04	3.009E-05	1.113E+06	3.213E-05	1.189E+06
I-130	2.985E+00	1.104E+11	3.487E+01	1.290E+12	3.786E+01	1.401E+12
I-131	3.385E+01	1.252E+12	4.915E+02	1.819E+13	5.254E+02	1.944E+13
I-132	3.305E+01	1.223E+12	1.520E+02	5.624E+12	1.851E+02	6.849E+12
I-133	6.775E+01	2.507E+12	8.692E+02	3.216E+13	9.369E+02	3.467E+13
I-134	2.896E+01	1.072E+12	3.175E+01	1.175E+12	6.071E+01	2.246E+12
I-135	5.703E+01	2.110E+12	5.471E+02	2.024E+13	6.042E+02	2.236E+13
Rb-86m	4.849E-06	1.794E+05	1.306E-39	4.832E-29	4.849E-06	1.794E+05
Rb-86	1.683E-01	6.227E+09	2.480E+00	9.176E+10	2.648E+00	9.798E+10
Rb-88	4.004E+03	1.481E+14	6.652E+03	2.461E+14	1.066E+04	3.944E+14
Rb-89	2.983E+02	1.104E+13	1.662E+00	6.149E+10	2.999E+02	1.110E+13
Cs-134	1.887E+01	6.982E+11	2.796E+02	1.035E+13	2.985E+02	1.104E+13
Cs-136	4.672E+00	1.729E+11	6.863E+01	2.539E+12	7.330E+01	2.712E+12
Cs-137	7.195E+00	2.662E+11	1.067E+02	3.948E+12	1.139E+02	4.214E+12
Cs-138	1.765E+03	6.531E+13	2.733E+02	1.011E+13	2.038E+03	7.541E+13
Sr-89	2.739E-01	1.013E+10	1.163E+00	4.303E+10	1.437E+00	5.317E+10
Ba-137m	6.794E+00	2.514E+11	1.009E+02	3.733E+12	1.077E+02	3.985E+12
Total	3.848E+04	1.424E+15	7.277E+04	2.692E+15	1.113E+05	4.118E+15

RAI No 1013

Background: 10 CFR 51.45(d) states that the environmental report will contain a status of compliance for all federal permits, licenses, approvals and other entitlements which must be obtained in connection with the proposed action and shall also describe the status of compliance with the requirements.

> The Nuclear Waste Policy Act (NWPA) states that the Commission shall not issue or renew a license to any person to use a utilization or production facility under the authority of section 103 or 104 of the Atomic Energy Act of 1954 [42 U.S.C. 2133, 2134J unless-
>
> > (i) such person has entered into a contract with the Secretary of Energy for the nuclear waste fund; or
> > (ii) the Secretary affirms in writing that such person is actively and in good faith negotiating with the Secretary of Energy for a contract.

Neither Section 1.3 nor Table 1.3-1 in the ER provides a status on the NWPA requirements.

Provide documentation that the requirements in the NWPA have been met or provide a status for meeting the requirements set forth in the NWPA.

Response

CCNPP Unit 3 has entered into a Contract for Disposal of Spent Nuclear Fuel and/or High-level Radioactive Waste with the U.S. Department of Energy (DOE). Under this contract, the DOE will begin the acceptance of Spent Nuclear Fuel (SNF) no earlier than twenty (20) years from the initial discharge date of SNF from CCNPP Unit 3. The subject contract was made and entered into under the authority of the Nuclear Waste Policy Act of 1982.

COLA Impact

A new Section 1.3.1.12 will be added to the ER as follows in a future COLA revision:

> **1.3.1.12 U.S. Department of Energy (DOE)**
>
> CCNPP Unit 3 has entered into a Contract for Disposal of Spent Nuclear Fuel and/or High-level Radioactive Waste with the U.S. Department of Energy (DOE). Under this contract, the DOE will begin the acceptance of Spent Nuclear Fuel (SNF) no earlier than twenty (20) years from the initial discharge date of SNF from CCNPP Unit 3. The subject contract was made and entered into under the authority of the Nuclear Waste Policy Act of 1982.