August 1, 2001

NOTE TO: Docket File

FROM: David E. LaBarge, Senior Project Manager, Section 1 ***/RA/***
Project Directorate II
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

SUBJECT: OCONEE NUCLEAR STATION, UNIT 3 RE: INFORMATION RELATED TO PROPOSED TECHNICAL SPECIFICATION FOR A ONE-TIME CHANGE TO THE CONTAINMENT INTEGRATED LEAK RATE SCHEDULE (TAC NO. MB1377)

By letter dated March 5, 2001, Duke Energy Corporation (Duke) submitted a proposed one-time change to the Oconee Nuclear Station, Unit 3 Technical Specifications (TSs) to extend the containment integrated leak rate test interval. This extension is needed so that performance of two Type A tests will not be required in successive refueling outages, one at the TS-required interval and one following replacement of the once-through steam generators. The attached probabilistic risk analysis calculation was performed by the NRC staff and supplied to Duke as an example of the results that can be obtained using an analysis method designed by the staff and employing Oconee-specific data. It is preliminary (draft) information that has been used for discussion purposes. The purpose of this note is to make the information publicly available.

Docket No. 50-287

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IP3 calculation to extend Type A Test Interval							
From 1 in 10 Years to 1 in 15 Years							
Removing Class 3A and 3B from the No Containment Failure Bin							
From Table 1 on page 11 of IP3's January 18, 2001 submittal							
CDF =	4.40e-05						
No containment failure frequency =			2.79e-05				
		Table 1 - Baseline Mean Consequence Measures					
Class	Description				Frequency	Person-Rem	Person-Rem
					Per Rx-yr		per year
1	No Containment Failure				2.42e-05	1.41e+06	3.41e+01
2	Large Cont Isolation Failures (failure to close)				5.15e-09	4.94e+07	2.54e-01
3a	Small Isolation Failure (Type A test)				2.82e-06	1.41e+07	3.97e+01
3b	Large Isolation Failure (Type A test)				9.24e-07	4.94e+07	4.56e+01
6	Other Isolation Failures (dependent failures)				8.94e-09	4.94e+07	4.41e-01
7	Severe Accident Phenomena (Early and Late)				1.36e-05	1.41e+08	1.92e+03
8	Containment Bypassed (SGTR)				2.43e-06	5.33e+09	1.30e+04
CDF					4.39e-05		14989.566
Class 1 frequency = D8-Class3a-Class3b =					2.42e-05		
Class 2 frequency = From Table 1=					5.15e-09		
Class 3a frequency = .064*CDF=					2.82e-06		
Class 3b frequency = .021*CDF =					9.24e-07		
Class 6 frequency = From Table 1 =					8.94e-09		
Class 7 frequency = With Class 3A and 3B =					1.36e-05		
Class 8 frequency = From Table 1 =					2.43e-06		
Class 1 dose = From Table 2 =				1.41e+06			
Class 2 dose = From Table 2 =				4.94e+07			
Class 3a dose = From Table 2 =				1.41e+07			
Class 3b dose = From Table 2 =				4.94e+07			
Class 6 dose = From Table 2 =				4.94e+07			
Class 7 dose = From Table 2 =				1.41e+08			
Class 8 dose = From Table 2 =				5.33e+09			

CCFP = 1 minus (Class 1 plus Class 3a/CDF) =				3.861e-01			
		Table 2 - Mean Consequence Measures for 10 Year Test Interval					
Class	Description				Frequency	Person-Rem	Person-Rem
					Per Rx-yr		per year
1	No Containment Failure				2.38e-05	1.41e+06	3.35e+01
2	Large Cont Isolation Failures (failure to close)				5.15e-09	4.94e+07	2.54e-01
3a	Small Isolation Failure (Type A test)				3.10e-06	1.41e+07	4.37e+01
3b	Large Isolation Failure (Type A test)				1.02e-06	4.94e+07	5.02e+01
6	Other Isolation Failures (dependent failures)				8.94e-09	4.94e+07	4.41e-01
7	Severe Accident Phenomena (Early and Late)				1.36e-05	1.41e+08	1.92e+03
8	Containment Bypassed (SGTR)				2.43e-06	5.33e+09	1.30e+04
CDF					4.39e-05		14997.569
Class 1 frequency = D8-Class3a-Class3b =					2.38e-05		
Class 2 frequency = From Table 1=					5.15e-09		
Class 3a frequency = .064*CDF*1.1=					3.10e-06		
Class 3b frequency = .021*CDF*1.1 =					1.02e-06		
Class 6 frequency = From Table 1 =					8.94e-09		
Class 7 frequency = With Class 3A and 3B =					1.36e-05		
Class 8 frequency = From Table 1 =					2.43e-06		
CCFP = 1 minus (Class 1 plus Class 3a/CDF) =				3.882e-01			
		Table 3 - Mean Consequence Measures for 15 Year Test Interval					
Class	Description				Frequency	Person-Rem	Person-Rem
					Per Rx-yr		Per Year
1	No Containment Failure				2.36e-05	1.41e+06	3.33e+01
2	Large Cont Isolation Failures (failure to close)				5.15e-09	4.94e+07	2.54e-01
3a	Small Isolation Failure (Type A test)				3.24e-06	1.41e+07	4.57e+01
3b	Large Isolation Failure (Type A test)				1.06e-06	4.94e+07	5.24e+01
6	Other Isolation Failures (dependent failures)				8.94e-09	4.94e+07	4.41e-01
7	Severe Accident Phenomena (Early and Late)				1.36e-05	1.41e+08	1.92e+03
8	Containment Bypassed (SGTR)				2.43e-06	5.33e+09	1.30e+04

CDF					4.39e-05		15001.571
Class 1 frequency = D8-Class3a-Class3b =					2.36e-05		
Class 2 frequency = From Table 1=					5.15e-09		
Class 3a frequency = .064*CDF*1.15 =					3.24e-06		
Class 3b frequency = .021*CDF*1.15 =					1.06e-06		
Class 6 frequency = From Table 1 =					8.94e-09		
Class 7 frequency = With Class 3A and 3B =					1.36e-05		
Class 8 frequency = From Table 1 =					2.43e-06		
CCFP = 1 minus (Class 1 plus Class 3a/CDF) =				3.893e-01			
		Table 4 - Mean Consequence Measures for 20 Year Test Interval					
Class	Description				Frequency	Person-Rem	Person-Rem
					Per Rx-yr		Per Year
1	No Containment Failure				2.34e-05	1.41e+06	3.30e+01
2	Large Cont Isolation Failures (failure to close)				5.15e-09	4.94e+07	2.54e-01
3a	Small Isolation Failure (Type A test)				3.38e-06	1.41e+07	4.76e+01
3b	Large Isolation Failure (Type A test)				1.11e-06	4.94e+07	5.47e+01
6	Other Isolation Failures (dependent failures)				8.94e-09	4.94e+07	4.41e-01
7	Severe Accident Phenomena (Early and Late)				1.36e-05	1.41e+08	1.92e+03
8	Containment Bypassed (SGTR)				2.43e-06	5.33e+09	1.30e+04
CDF					4.39e-05		15005.572
Class 1 frequency = D8-Class3a-Class3b =					2.34e-05		
Class 2 frequency = From Table 1=					5.15e-09		
Class 3a frequency = .064*CDF*1.2 =					3.38e-06		
Class 3b frequency = .021*CDF*1.2 =					1.11e-06		
Class 6 frequency = From Table 1 =					8.94e-09		
Class 7 frequency = With Class 3A and 3B =					1.36e-05		
Class 8 frequency = From Table 1 =					2.43e-06		
CCFP = 1 minus (Class 1 plus Class 3a/CDF) =				3.903e-01			

Delta LERF going from 3 in 10 year test interval to 1 in 15 year test interval =							
Difference in Class 3b frequency =			1.39e-07				
Delta LERF going from 3 in 10 year test interval to 1 in 20 year test interval =							
Difference in Class 3b frequency =			1.85e-07				
Delta LERF going from 3 in 10 year test interval to 1 in 15 year test interval =							
Using IP3 Methodolgy = Class3bBase*.12 =				1.11e-07			
Delta LERF going from 1 in 10 year test interval to 1 in 15 year test interval =							
Difference in Class 3b frequency =			4.62e-08				
Delta LERF going from 1 in 10 year test interval to 1 in 15 year test interval =							
Using IP3 Methodolgy = Class3b10*.05 =				5.08e-08			
Delta person-rem/year going from 3 in 10 year test interval to 1 in 15 year interval =							12.00474
Percentage increase = ((Total15 - Total Base)/Total Base)*100 =						0.08%	
Delta person-rem/year going from 1 in 10 year test interval to 1 in 15 year interval =							4.00158
Percentage increase = ((Total15 - Total10)/Total10)*100 =					0.03%		
Delta increase in CCFP going from 3 in 10 year test interval to 1 in 15 year interval =							0.32%
Delta increase in CCFP going from 1 in 10 year test interval to 1 in 15 year interval =							0.11%
For a plant with CDF =		1e-04					
Class 3b frequency = 0.021*CDF =			0.0000021				
Class 3b frequency for 15 year interval = 0.021*CDF*1.15 =					0.0000024		
Class 3b frequency for 20 year interval = 0.021*CDF*1.2 =					0.0000025		
Delta LERF going from 3 in 10 year test interval to 1 in 15 year test interval =							
Difference in Class 3b frequency =			3.15e-07				
Delta LERF going from 3 in 10 year test interval to 1 in 20 year test interval =							
Difference in Class 3b frequency =			4.20e-07				

If data base was 1 large failure out of 145 tests then:							
For a plant with CDF =		1e-04					
Class 3b frequency = 0.033*CDF =			0.0000033				
Class 3b frequency for 15 year interval = 0.033*CDF*1.15 =					0.0000038		
Class 3b frequency for 20 year interval = 0.033*CDF*1.2 =					0.000004		
Delta LERF going from 3 in 10 year test interval to 1 in 15 year test interval =							
Difference in Class 3b frequency =			4.95e-07				
Delta LERF going from 3 in 10 year test interval to 1 in 20 year test interval =							
Difference in Class 3b frequency =			6.60e-07				
Reproduction of IP3 calculation to extend Type A Test Interval							
From 1 in 10 Years to 1 in 15 Years For Crystal River Increasing No Containment Failure Frequency							
From Table 6 on page 9 of Crystal River's April 25, 2001 submittal							
CDF =	1.38e-05						
No containment failure frequency =			7.80e-06				
		Table 1 - Baseline Mean Consequence Measures					
Class	Description				Frequency	Person-Rem	Person-Rem
					Per Rx-yr		per year
1	No Containment Failure				6.63e-06	1.97e+03	1.31e-02
3a	small liner breach				8.83e-07	9.87e+03	8.72e-03
3b	large liner breach				2.90e-07	3.45e+04	1.00e-02
7	Severe Accident Phenomena (Early and Late)				5.36e-06	9.87e+04	5.29e-01
8	Containment Bypassed (SGTR)				6.69e-07	2.02e+05	1.35e-01
CDF					1.38e-05		0.69598
Class 1 frequency = RC8+RC9-Class3a-Class3b=				6.63e-06			
Class 3a frequency = .064*CDF=			8.83e-07				
Class 3b frequency = .021*CDF =			2.90e-07				
Class 7 frequency =		5.36e-06		From Table 6			

Class 8 frequency =		6.69e-07		From Table 6			
Class 1 dose = 987 person-rem*2La =				1.97e+03			
Class 3a dose = 987 person-rem*10La =				9.87e+03			
Class 3b dose = 987 person-rem*35La =				3.45e+04			
Class 7 dose = 987 person-rem*100La =				9.87e+04			
Class 8 dose =				2.02e+05			
CCFP = 1 minus (Class 1 plus Class 3a/CDF) =				4.569e-01			
		Table 2 - Mean Consequence Measures for 10 Year Test Interval					
Class	Description				Frequency	Person-Rem	Person-Rem
					Per Rx-yr		per year
1	No Containment Failure				6.51e-06	1.97e+03	1.29e-02
3a	small liner breach				9.72e-07	9.87e+03	9.59e-03
3b	large liner breach				3.19e-07	3.45e+04	1.10e-02
7	Severe Accident Phenomena (Early and Late)				5.36e-06	9.87e+04	5.29e-01
8	Containment Bypassed (SGTR)				6.69e-07	2.02e+05	1.35e-01
CDF					1.38e-05		0.6976213
Class 1 frequency = RC8+RC9-Class3a-Class3b=				6.51e-06			
Class 3a frequency = .064*CDF*1.1=			9.72e-07				
Class 3b frequency = .021*CDF*1.1 =			3.19e-07				
Class 7 frequency =		5.36e-06					
Class 8 frequency =		6.69e-07					
CCFP = 1 minus (Class 1 plus Class 3a/CDF) =				4.590e-01			
		Table 3 - Mean Consequence Measures for 15 Year Test Interval					
Class	Description				Frequency	Person-Rem	Person-Rem
					Per Rx-yr		Per Year
1	No Containment Failure				6.45e-06	1.97e+03	1.27e-02
3a	small liner breach				1.02e-06	9.87e+03	1.00e-02
3b	large liner breach				3.33e-07	3.45e+04	1.15e-02

7	Severe Accident Phenomena (Early and Late)				5.36e-06	9.87e+04	5.29e-01
8	Containment Bypassed (SGTR)				6.69e-07	2.02e+05	1.35e-01
CDF					1.38e-05		0.6984419
Class 1 frequency = RC8+RC9-Class3a-Class3b=				6.45e-06			
Class 3a frequency = .064*CDF*1.15 =				1.02e-06			
Class 3b frequency = .021*CDF*1.15 =				3.33e-07			
Class 7 frequency =				5.36e-06			
Class 8 frequency =				6.69e-07			
CCFP = 1 minus (Class 1 plus Class 3a/CDF) =				4.601e-01			
Delta LERF going from 3 in 10 year test interval to 1 in 15 year test interval =							
Difference in Class 3b frequency =			4.35e-08				
Delta LERF going from 3 in 10 year test interval to 1 in 15 year test interval =							
Using IP3 Methodolgy = Class3bBase*.12 =				3.48e-08			
Delta LERF going from 1 in 10 year test interval to 1 in 15 year test interval =							
Difference in Class 3b frequency =			1.45e-08				
Delta LERF going from 3 in 10 year test interval to 1 in 15 year test interval =							
Using IP3 Methodolgy = Class3b10*.05 =				1.59e-08			
Delta person-rem/year going from 3 in 10 year test interval to 1 in 15 year interval =							0.0024619
Percentage increase = ((Total15 - Total Base)/Total Base)*100 =						0.35%	
Delta person-rem/year going from 1 in 10 year test interval to 1 in 15 year interval =							0.0008206
Percentage increase = ((Total15 - Total10)/Total10)*100 =					0.12%		
Percent increase in CCFP going from 3 in 10 year test interval to 1 in 15 year interval =							0.69%
Percent increase in CCFP going from 1 in 10 year test interval to 1 in 15 year interval =							0.23%

Reproduction of Crystal River calculation to extend Type A Test Interval							
From 1 in 10 Years to 1 in 15 Years							
From Table 6 on page 9 of Crystal River's April 25, 2001 submittal							
CDF =	1.38e-05						
No containment failure frequency =			4.00e-06				
		Table 1 - Baseline Mean Consequence Measures					

Class	Description				Frequency	Persn-Rem	Persn-Rem
					per Rx-yr		per year
1	No Containment Failure				2.81e-06	9.87e+02	2.78e-03
2	Large Cont Isolation Failures (failure to close)				9.24e-08	6.58e+05	6.08e-02
3a	Small Isolation Failure (Type A test)				8.83e-07	9.87e+03	8.72e-03
3b	Large Isolation Failure (Type A test)				2.90e-07	3.45e+04	1.00e-02
6	Other Isolation Failures (dependent failures)				1.38e-08	3.45e+04	4.77e-04
7	Severe Accident Phenomena (Early and Late)				9.06e-06	1.97e+05	1.78e+00
8	Containment Bypassed (SGTR)				6.69e-07	2.02e+05	1.35e-01
CDF					1.38e-05		2.0027389
Class 1 frequency = RC9-Class3a-Class3b-Class6 =					2.81e-06		
Class 2 frequency =					9.24e-08		
Class 3a frequency = .064*CDF=					8.83e-07		
Class 3b frequency = .021*CDF =					2.90e-07		
Class 6 frequency =					1.38e-08		
Class 7 frequency = From Table 6 =					9.06e-06		
Class 8 frequency = From Table 6 =					6.69e-07		
Class 1 dose = 987 person-rem*La =				9.87e+02			
Class 2 dose = CR Level 3 =				6.58e+05			
Class 3a dose = 987 person-rem*10La =				9.87e+03			
Class 3b dose = 987 person-rem*35La =				3.45e+04			
Class 6 dose = 987 person-rem*35La =				3.45e+04			
Class 7 dose = CR Level 3 =				1.97e+05			
Class 8 dose = CR Level 3 =				2.02e+05			
CCFP = 1 minus (Class 1 plus Class 3a/CDF) =				7.326e-01			
		Table 2 - Mean Consequence Measures for 10 Year Test Interval					
Class	Description				Frequency	Persn-Rem	Persn-Rem
					per Rx-yr		per year
1	No Containment Failure				2.70e-06	9.87e+02	2.66e-03
2	Large Cont Isolation Failures (failure to close)				9.24e-08	6.58e+05	6.08e-02
3a	Small Isolation Failure (Type A test)				9.72e-07	9.87e+03	9.59e-03

3b	Large Isolation Failure (Type A test)				3.19e-07	3.45e+04	1.10e-02
6	Other Isolation Failures (dependent failures)				1.38e-08	3.45e+04	4.77e-04
7	Severe Accident Phenomena (Early and Late)				9.06e-06	1.97e+05	1.78e+00
8	Containment Bypassed (SGTR)				6.69e-07	2.02e+05	1.35e-01
CDF					1.38e-05		2.0044959
Class 1 frequency = RC9-Class3a-Class3b-Class 6 =					2.70e-06		
Class 2 frequency =					9.24e-08		
Class 3a frequency = .064*CDF*1.1=					9.72e-07		
Class 3b frequency = .021*CDF*1.1 =					3.19e-07		
Class 6 frequency =					1.38e-08		
Class 7 frequency = From Table 6 =					9.06e-06		
Class 8 frequency = From Table 6 =					6.69e-07		
CCFP = 1 minus (Class 1 plus Class 3a/CDF) =				7.347e-01			
		Table 3 - Mean Consequence Measures for 15 Year Test Interval					
Class	Description				Frequency	Persn-Rem	Persn-Rem
					per Rx-yr		per year
1	No Containment Failure				2.64e-06	9.87e+02	2.60e-03
2	Large Cont Isolation Failures (failure to close)				9.24e-08	6.58e+05	6.08e-02
3a	Small Isolation Failure (Type A test)				1.02e-06	9.87e+03	1.00e-02
3b	Large Isolation Failure (Type A test)				3.33e-07	3.45e+04	1.15e-02
6	Other Isolation Failures (dependent failures)				1.38e-08	3.45e+04	4.77e-04
7	Severe Accident Phenomena (Early and Late)				9.06e-06	1.97e+05	1.78e+00
8	Containment Bypassed (SGTR)				6.69e-07	2.02e+05	1.35e-01
CDF					1.38e-05		2.0053745
Class 1 frequency = RC9-Class3a-Class3b-Class6 =					2.64e-06		
Class 2 frequency =					9.24e-08		
Class 3a frequency = .064*CDF*1.15 =					1.02e-06		
Class 3b frequency = .021*CDF*1.15 =					3.33e-07		
Class 6 frequency =					1.38e-08		
Class 7 frequency = From Table 6 =					9.06e-06		
Class 8 frequency = From Table 6 =					6.69e-07		

CCFP = 1 minus (Class 1 plus Class 3a/CDF) =				7.357e-01			
		Table 4 - Mean Consequence Measures for 20 Year Test Interval					
Class	Description				Frequency	Persn-Rem	Persn-Rem
					per Rx-yr		per year
1	No Containment Failure				2.58e-06	9.87e+02	2.55e-03
2	Large Cont Isolation Failures (failure to close)				9.24e-08	6.58e+05	6.08e-02
3a	Small Isolation Failure (Type A test)				1.06e-06	9.87e+03	1.05e-02
3b	Large Isolation Failure (Type A test)				3.48e-07	3.45e+04	1.20e-02
6	Other Isolation Failures (dependent failures)				1.38e-08	3.45e+04	4.77e-04
7	Severe Accident Phenomena (Early and Late)				9.06e-06	1.97e+05	1.78e+00
8	Containment Bypassed (SGTR)				6.69e-07	2.02e+05	1.35e-01
CDF					1.38e-05		2.006253
Class 1 frequency = RC9-Class3a-Class3b-Class6 =					2.58e-06		
Class 2 frequency =					9.24e-08		
Class 3a frequency = .064*CDF*1.2 =					1.06e-06		
Class 3b frequency = .021*CDF*1.2 =					3.48e-07		
Class 6 frequency =					1.38e-08		
Class 7 frequency = From Table 6 =					9.06e-06		
Class 8 frequency = From Table 6 =					6.69e-07		
Delta LERF going from 3 in 10 year test interval to 1 in 15 year test interval =							
Difference in Class 3b frequency =			4.35e-08				
Delta LERF going from 3 in 10 year test interval to 1 in 20 year test interval =							
Difference in Class 3b frequency =			5.80e-08				
Delta LERF going from 3 in 10 year test interval to 1 in 15 year test interval =							
Using IP3 Methodolgy = Class3bBase*.12 =				3.48e-08			
Delta LERF going from 1 in 10 year test interval to 1 in 15 year test interval =							
Difference in Class 3b frequency =			1.45e-08				

Delta LERF going from 1 in 10 year test interval to 1 in 15 year test interval =							
Using IP3 Methodolgy = Class3b10*.05 =				1.59e-08			
Delta person-rem/year going from 3 in 10 year test interval to 1 in 15 year interval =							0.0026356
Percentage increase = ((Total15 - Total Base)/Total Base)*100 =						0.13%	
Delta person-rem/year going from 1 in 10 year test interval to 1 in 15 year interval =							0.0008785
Percentage increase = ((Total15 - Total10)/Total10)*100 =					0.04%		
Delta increase in CCFP going from 3 in 10 year test interval to 1 in 15 year interval =							0.31%
Delta increase in CCFP going from 1 in 10 year test interval to 1 in 15 year interval =							0.10%

Sensitivity of Crystal River calculation to extend Type A Test Interval							
From 1 in 10 Years to 1 in 15 Years and Increasing Class 6 Doses							
From Table 6 on page 9 of Crystal River's April 25, 2001 submittal							
CDF =	1.38e-05						
No containment failure frequency =			4.00e-06				
		Table 1 - Baseline Mean Consequence Measures					
Class	Description				Frequency	Person-Rem	Person-Rem
					Per Rx-yr		per year
1	No Containment Failure				2.81e-06	9.87e+02	2.78e-03
2	Large Cont Isolation Failures (failure to close)				9.24e-08	6.58e+05	6.08e-02
3a	Small Isolation Failure (Type A test)				8.83e-07	9.87e+03	8.72e-03
3b	Large Isolation Failure (Type A test)				2.90e-07	3.45e+04	1.00e-02
6	Other Isolation Failures (dependent failures)				1.38e-08	6.58e+05	9.08e-03
7	Severe Accident Phenomena (Early and Late)				9.06e-06	1.97e+05	1.78e+00
8	Containment Bypassed (SGTR)				6.69e-07	2.02e+05	1.35e-01
CDF					1.38e-05		2.0113426
Class 1 frequency = RC9-Class3a-Class3b-Class6 =					2.81e-06		
Class 2 frequency =					9.24e-08		
Class 3a frequency = .064*CDF=					8.83e-07		
Class 3b frequency = .021*CDF =					2.90e-07		
Class 6 frequency =					1.38e-08		
Class 7 frequency = From Table 6 =					9.06e-06		
Class 8 frequency = From Table 6 =					6.69e-07		
Class 1 dose = 987 person-rem*La =				9.87e+02			
Class 2 dose = CR Level 3 =				6.58e+05			
Class 3a dose = 987 person-rem*10La =				9.87e+03			

Class 3b dose = 987 person-rem*35La =				3.45e+04			
Class 6 dose = Similar to Class 2 =				6.58e+05			
Class 7 dose = CR Level 3 =				1.97e+05			
Class 8 dose = CR Level 3 =				2.02e+05			
CCFP = 1 minus (Class 1 plus Class 3a/CDF) =				7.326e-01			
		Table 2 - Mean Consequence Measures for 10 Year Test Interval					
Class	Description				Frequency	Person-Rem	Person-Rem
					Per Rx-yr		per year
1	No Containment Failure				2.70e-06	9.87e+02	2.66e-03
2	Large Cont Isolation Failures (failure to close)				9.24e-08	6.58e+05	6.08e-02
3a	Small Isolation Failure (Type A test)				9.72e-07	9.87e+03	9.59e-03
3b	Large Isolation Failure (Type A test)				3.19e-07	3.45e+04	1.10e-02
6	Other Isolation Failures (dependent failures)				1.38e-08	6.58e+05	9.08e-03
7	Severe Accident Phenomena (Early and Late)				9.06e-06	1.97e+05	1.78e+00
8	Containment Bypassed (SGTR)				6.69e-07	2.02e+05	1.35e-01
CDF					1.38e-05		2.0130996
Class 1 frequency = RC9-Class3a-Class3b-Class 6 =					2.70e-06		
Class 2 frequency =					9.24e-08		
Class 3a frequency = .064*CDF*1.1=					9.72e-07		
Class 3b frequency = .021*CDF*1.1 =					3.19e-07		
Class 6 frequency =					1.38e-08		
Class 7 frequency = From Table 6 =					9.06e-06		
Class 8 frequency = From Table 6 =					6.69e-07		
CCFP = 1 minus (Class 1 plus Class 3a/CDF) =				7.347e-01			
		Table 3 - Mean Consequence Measures for 15 Year Test Interval					
Class	Description				Frequency	Person-Rem	Person-Rem
					Per Rx-yr		Per Year
1	No Containment Failure				2.64e-06	9.87e+02	2.60e-03
2	Large Cont Isolation Failures (failure to close)				9.24e-08	6.58e+05	6.08e-02

3a	Small Isolation Failure (Type A test)				1.02e-06	9.87e+03	1.00e-02
3b	Large Isolation Failure (Type A test)				3.33e-07	3.45e+04	1.15e-02
6	Other Isolation Failures (dependent failures)				1.38e-08	6.58e+05	9.08e-03
7	Severe Accident Phenomena (Early and Late)				9.06e-06	1.97e+05	1.78e+00
8	Containment Bypassed (SGTR)				6.69e-07	2.02e+05	1.35e-01
CDF					1.38e-05		2.0139781
Class 1 frequency = RC9-Class3a-Class3b-Class6 =					2.64e-06		
Class 2 frequency =					9.24e-08		
Class 3a frequency = .064*CDF*1.15 =					1.02e-06		
Class 3b frequency = .021*CDF*1.15 =					3.33e-07		
Class 6 frequency =					1.38e-08		
Class 7 frequency = From Table 6 =					9.06e-06		
Class 8 frequency = From Table 6 =					6.69e-07		
CCFP = 1 minus (Class 1 plus Class 3a/CDF) =				7.357e-01			
Delta LERF going from 3 in 10 year test interval to 1 in 15 year test interval =							
Difference in Class 3b frequency =			4.35e-08				
Delta LERF going from 3 in 10 year test interval to 1 in 15 year test interval =							
Using IP3 Methodolgy = Class3bBase*.12 =				3.48e-08			
Delta LERF going from 1 in 10 year test interval to 1 in 15 year test interval =							
Difference in Class 3b frequency =			1.45e-08				
Delta LERF going from 1 in 10 year test interval to 1 in 15 year test interval =							
Using IP3 Methodolgy = Class3b10*.05 =				1.59e-08			
Delta person-rem/year going from 3 in 10 year test interval to 1 in 15 year interval =							0.0026356
Percentage increase = ((Total15 - Total Base)/Total Base)*100 =						0.13%	
Delta person-rem/year going from 1 in 10 year test interval to 1 in 15 year interval =							0.0008785
Percentage increase = ((Total15 - Total10)/Total10)*100 =					0.04%		
Delta increase in CCFP going from 3 in 10 year test interval to 1 in 15 year interval =							0.31%
Delta increase in CCFP going from 1 in 10 year test interval to 1 in 15 year interval =							0.10%

Reproduction of Crystal River calculation to extend Type A Test Interval
From 1 in 10 Years to 1 in 15 Years Using Peach Bottom Plant Specific Data

From Table 5-1 of Peach Bottom's May 30, 2001 submittal

CDF = 4.53e-06

No containment failure frequency = 2.94e-06

Table 1 - Baseline Mean Consequence Measures

Class	Description	Frequency per Rx-yr	Persn-Rem per Rx-yr	Persn-Rem per year
1a	No Containment Failure	1.79e-06	8.30e+03	1.49e-02
1b	No Containment Failure (including suc venting)	2.25e-08	3.28e+06	7.38e-02
1c	No Containment Failure (some TW like seqs)	7.38e-07	3.44e+05	2.54e-01
2	Large Cont Isolation Failures (failure to close)		4.98e+06	0.00e+00
3a	Small Isolation Failure (Type A test)	2.90e-07	8.30e+04	2.41e-02
3b	Large Isolation Failure (Type A test)	9.51e-08	2.90e+05	2.76e-02

6	Other Isolation Failures (dependent failures)					4.98e+06	0.00e+00
7	Severe Accident Phenomena (Early and Late)				1.59e-06	3.70e+06	5.88e+00
8	Containment Bypassed (Event V)				2.30e-09	3.78e+06	8.69e-03
CDF					4.53e-06		6.2859586
Class 1a frequency = D7-Class1a-Class1b-Class3a-Class3b =					1.79e-06		
Class 1b frequency =					2.25e-08		
Class 1c frequency =					7.38e-07		
Class 2 frequency = From Table 5-1 =					n/a		
Class 3a frequency = .064*CDF=					2.90e-07		
Class 3b frequency = .021*CDF =					9.51e-08		
Class 6 frequency = From Table 5-1 =					n/a		
Class 7 frequency = From Table 5-1 =					1.59e-06		
Class 8 frequency = From Table 5-1 =					2.30e-09		
Class 1a dose = From Table 5-2 =				8.30e+03			
Class 1b dose = From Table 5-2 =				3.28e+06			
Class 1c dose = From Table 5-2 =				3.44e+05			
Class 2 dose = From Table 5-2 =				4.98e+06			
Class 3a dose = 8.30E+03 person-rem*10La =				8.30e+04			
Class 3b dose = 8.30E+03 person-rem*35La =				2.90e+05			
Class 6 dose = From Table 5-2 =				4.98e+06			
Class 7 dose = From Table 5-2 =				3.70e+06			
Class 8 dose = From Table 5-2 =				3.78e+06			
CCFP = 1 minus (Class 1 plus Class 3a/CDF) =				3.723e-01			
		Table 2 - Mean Consequence Measures for 10 Year Test Interval					
Class	Description				Frequency	Persn-Rem	Persn-Rem
					per Rx-yr		per year
1a	No Containment Failure				1.76e-06	8.30e+03	1.46e-02
1b	No Containment Failure (including suc venting)				2.25e-08	3.28e+06	7.38e-02
1c	No Containment Failure (some TW like seqs)				7.38e-07	3.44e+05	2.54e-01
2	Large Cont Isolation Failures (failure to close)					4.98e+06	0.00e+00
3a	Small Isolation Failure (Type A test)				3.19e-07	8.30e+04	2.65e-02
3b	Large Isolation Failure (Type A test)				1.05e-07	2.90e+05	3.04e-02

6	Other Isolation Failures (dependent failures)					4.98e+06	0.00e+00
7	Severe Accident Phenomena (Early and Late)				1.59e-06	3.70e+06	5.88e+00
8	Containment Bypassed (Event V)				2.30e-09	3.78e+06	8.69e-03
CDF					4.53e-06		6.2908088
Class 1a frequency = D7-Class1a-Class1b-Class3a-Class3b =					1.76e-06		
Class 1b frequency =					2.25e-08		
Class 1c frequency =					7.38e-07		
Class 2 frequency = From Table 5-1 =					n/a		
Class 3a frequency = .064*CDF*1.1=					3.19e-07		
Class 3b frequency = .021*CDF*1.1 =					1.05e-07		
Class 6 frequency = From Table 5-1 =					n/a		
Class 7 frequency = From Table 5-1 =					1.59e-06		
Class 8 frequency = From Table 5-1 =					2.30e-09		
CCFP = 1 minus (Class 1 plus Class 3a/CDF) =				3.744e-01			
		Table 3 - Mean Consequence Measures for 15 Year Test Interval					
Class	Description				Frequency	Persn-Rem	Persn-Rem
					per Rx-yr		Per Year
1a	No Containment Failure				1.74e-06	8.30e+03	1.44e-02
1b	No Containment Failure (including suc venting)				2.25e-08	3.28e+06	7.38e-02
1c	No Containment Failure (some TW like seqs)				7.38e-07	3.44e+05	2.54e-01
2	Large Cont Isolation Failures (failure to close)					4.98e+06	0.00e+00
3a	Small Isolation Failure (Type A test)				3.33e-07	8.30e+04	2.77e-02
3b	Large Isolation Failure (Type A test)				1.09e-07	2.90e+05	3.18e-02
6	Other Isolation Failures (dependent failures)					4.98e+06	0.00e+00
7	Severe Accident Phenomena (Early and Late)				1.59e-06	3.70e+06	5.88e+00
8	Containment Bypassed (Event V)				2.30e-09	3.78e+06	8.69e-03
CDF					4.53e-06		6.293234
Class 1a frequency = D7-Class1a-Class1b-Class3a-Class3b =					1.74e-06		
Class 1b frequency =					2.25e-08		
Class 1c frequency =					7.38e-07		
Class 2 frequency = From Table 5-1 =					n/a		

Class 3a frequency = .064*CDF*1.15 =					3.33e-07		
Class 3b frequency = .021*CDF*1.15 =					1.09e-07		
Class 6 frequency = From Table 5-1 =					n/a		
Class 7 frequency = From Table 5-1 =					1.59e-06		
Class 8 frequency = From Table 5-1 =					2.30e-09		
CCFP = 1 minus (Class 1 plus Class 3a/CDF) =				3.755e-01			
Delta LERF going from 3 in 10 year test interval to 1 in 15 year test interval =							
Difference in Class 3b frequency =			1.43e-08				
Delta LERF going from 3 in 10 year test interval to 1 in 15 year test interval =							
Using IP3 Methodolgy = Class3bBase*.12 =				1.14e-08			
Delta LERF going from 1 in 10 year test interval to 1 in 15 year test interval =							
Difference in Class 3b frequency =			4.76e-09				
Delta LERF going from 1 in 10 year test interval to 1 in 15 year test interval =							
Using IP3 Methodolgy = Class3b10*.05 =				5.23e-09			
Delta person-rem/year going from 3 in 10 year test interval to 1 in 15 year interval =							0.0072754
Percentage increase = ((Total15 - Total Base)/Total Base)*100 =						0.12%	
Delta person-rem/year going from 1 in 10 year test interval to 1 in 15 year interval =							0.0024251
Percentage increase = ((Total15 - Total10)/Total10)*100 =					0.04%		
Delta increase in CCFP going from 3 in 10 year test interval to 1 in 15 year interval =							0.31%
Delta increase in CCFP going from 1 in 10 year test interval to 1 in 15 year interval =							0.10%

Reproduction of Crystal River calculation to extend Type A Test Interval
From 1 in 10 Years to 1 in 15 Years Using Waterford Plant Specific Data

From Table 5-2 and 5-6 of CEOG topical report dated July 19, 2001							
CDF =	2.54e-05						
No containment failure frequency =			1.31e-05				
		Table 1 - Baseline Mean Consequence Measures					
Class	Description				Frequency	Persn-Rem	Persn-Rem
					per Rx-yr		per year
1	No Containment Failure				1.09e-05	6.73e+04	7.36e-01
2	Large Cont Isolation Failures (failure to close)				2.54e-08	6.73e+06	1.71e-01
3a	Small Isolation Failure (Type A test)				1.63e-06	6.73e+05	1.09e+00
3b	Large Isolation Failure (Type A test)				5.33e-07	2.36e+06	1.26e+00
6	Other Isolation Failures (dependent failures)				4.78e-10	2.36e+06	1.13e-03
7	Severe Accident Phenomena (Early and Late)				1.08e-05	1.88e+07	2.04e+02
8	Containment Bypassed (SGTR)				1.47e-06	1.08e+08	1.59e+02
CDF					2.54e-05		365.53405
Class 1 frequency = D7-Class3a-Class3b =					1.09e-05		
Class 2 frequency = From Table 5-2 =					2.54e-08		
Class 3a frequency = .064*CDF=					1.63e-06		
Class 3b frequency = .021*CDF =					5.33e-07		
Class 6 frequency = From Table 5-2 =					4.78e-10		
Class 7 frequency = From Table 5-2 =					1.08e-05		
Class 8 frequency = From Table 5-2 =					1.47e-06		
Class 1 dose = La =				6.73e+04			
Class 2 dose = 100*La =				6.73e+06			
Class 3a dose = 10*La =				6.73e+05			
Class 3b dose = 35*La =				2.36e+06			
Class 6 dose = 35*La =				2.36e+06			
Class 7 dose = 280*La =				1.88e+07			
Class 8 dose = Table 5-4 =				1.08e+08			
CCFP = 1 minus (Class 1 plus Class 3a/CDF) =				5.052e-01			
		Table 2 - Mean Consequence Measures for 10 Year Test Interval					

Class	Description				Frequency	Persn-Rem	Persn-Rem
					per Rx-yr		per year
1	No Containment Failure				1.07e-05	6.73e+04	7.22e-01
2	Large Cont Isolation Failures (failure to close)				2.54e-08	6.73e+06	1.71e-01
3a	Small Isolation Failure (Type A test)				1.79e-06	6.73e+05	1.20e+00
3b	Large Isolation Failure (Type A test)				5.87e-07	2.36e+06	1.38e+00
6	Other Isolation Failures (dependent failures)				4.78e-10	2.36e+06	1.13e-03
7	Severe Accident Phenomena (Early and Late)				1.08e-05	1.88e+07	2.04e+02
8	Containment Bypassed (SGTR)				1.47e-06	1.08e+08	1.59e+02
CDF					2.54e-05		365.75456
Class 1 frequency = D7-Class3a-Class3b =					1.07e-05		
Class 2 frequency = From Table 5-2 =					2.54e-08		
Class 3a frequency = .064*CDF*1.1 =					1.79e-06		
Class 3b frequency = .021*CDF*1.1 =					5.87e-07		
Class 6 frequency = From Table 5-2 =					4.78e-10		
Class 7 frequency = From Table 5-2 =					1.08e-05		
Class 8 frequency = From Table 5-2 =					1.47e-06		
CCFP = 1 minus (Class 1 plus Class 3a/CDF) =				5.073e-01			

Table 3 - Mean Consequence Measures for 15 Year Test Interval

Class	Description				Frequency	Persn-Rem	Persn-Rem
					per Rx-yr		per year
1	No Containment Failure				1.06e-05	6.73e+04	7.15e-01
2	Large Cont Isolation Failures (failure to close)				2.54e-08	6.73e+06	1.71e-01
3a	Small Isolation Failure (Type A test)				1.87e-06	6.73e+05	1.26e+00
3b	Large Isolation Failure (Type A test)				6.13e-07	2.36e+06	1.44e+00
6	Other Isolation Failures (dependent failures)				4.78e-10	2.36e+06	1.13e-03
7	Severe Accident Phenomena (Early and Late)				1.08e-05	1.88e+07	2.04e+02
8	Containment Bypassed (SGTR)				1.47e-06	1.08e+08	1.59e+02
CDF					2.54e-05		365.86482
Class 1 frequency = D7-Class3a-Class3b =					1.06e-05		

Class 2 frequency = From Table 5-2 =					2.54e-08		
Class 3a frequency = .064*CDF*1.15 =					1.87e-06		
Class 3b frequency = .021*CDF*1.15 =					6.13e-07		
Class 6 frequency = From Table 5-2 =					4.78e-10		
Class 7 frequency = From Table 5-2 =					1.08e-05		
Class 8 frequency = From Table 5-2 =					1.47e-06		
CCFP = 1 minus (Class 1 plus Class 3a/CDF) =				5.083e-01			
		Table 4 - Mean Consequence Measures for 20 Year Test Interval					
Class	Description				Frequency	Persn-Rem	Persn-Rem
					per Rx-yr		per year
1	No Containment Failure				1.05e-05	6.73e+04	7.07e-01
2	Large Cont Isolation Failures (failure to close)				2.54e-08	6.73e+06	1.71e-01
3a	Small Isolation Failure (Type A test)				1.95e-06	6.73e+05	1.31e+00
3b	Large Isolation Failure (Type A test)				6.40e-07	2.36e+06	1.51e+00
6	Other Isolation Failures (dependent failures)				4.78e-10	2.36e+06	1.13e-03
7	Severe Accident Phenomena (Early and Late)				1.08e-05	1.88e+07	2.04e+02
8	Containment Bypassed (SGTR)				1.47e-06	1.08e+08	1.59e+02
CDF					2.54e-05		365.97508
Class 1 frequency = D7-Class3a-Class3b =					1.05e-05		
Class 2 frequency = From Table 5-2 =					2.54e-08		
Class 3a frequency = .064*CDF*1.2 =					1.95e-06		
Class 3b frequency = .021*CDF*1.2 =					6.40e-07		
Class 6 frequency = From Table 5-2 =					4.78e-10		
Class 7 frequency = From Table 5-2 =					1.08e-05		
Class 8 frequency = From Table 5-2 =					1.47e-06		
Delta LERF going from 3 in 10 year test interval to 1 in 15 year test interval =							
Difference in Class 3b frequency =			8.00e-08				
Delta LERF going from 3 in 10 year test interval to 1 in 20 year test interval =							
Difference in Class 3b frequency =			1.07e-07				

Delta LERF going from 1 in 10 year test interval to 1 in 15 year test interval =							
Difference in Class 3b frequency =			2.67e-08				
Delta person-rem/year going from 3 in 10 year test interval to 1 in 15 year interval =							0.3307728
Percentage increase = ((Total15 - Total Base)/Total Base)*100 =						0.09%	
Delta person-rem/year going from 1 in 10 year test interval to 1 in 15 year interval =							0.1102576
Percentage increase = ((Total15 - Total10)/Total10)*100 =					0.03%		
Delta increase in CCFP going from 3 in 10 year test interval to 1 in 15 year interval =							0.32%
Delta increase in CCFP going from 1 in 10 year test interval to 1 in 15 year interval =							0.11%

Reproduction of Waterford calculation to extend Type A Test Interval							
From 1 in 10 Years to 1 in 15 Years Using CEOG topical report dated July 19, 2001							
From Table 5-2 and 5-6 of CEOG topical report dated July 19, 2001							
CDF =	2.54e-05						
No containment failure frequency =			1.31e-05				
		Table 1 - Baseline Mean Consequence Measures					
Class	Description				Frequency	Persn-Rem	Persn-Rem
					per Rx-yr		per year
1	No Containment Failure				1.27e-05	6.73e+04	8.57e-01
2	Large Cont Isolation Failures (failure to close)				2.54e-08	1.35e+07	3.42e-01
3a	Small Isolation Failure (Type A test)				3.67e-07	1.68e+06	6.17e-01
3b	Large Isolation Failure (Type A test)				2.20e-09	1.35e+07	2.96e-02
6	Other Isolation Failures (dependent failures)				4.78e-10	4.71e+06	2.25e-03
7	Severe Accident Phenomena (Early and Late)				1.08e-05	3.77e+07	4.07e+02
8	Containment Bypassed (SGTR)				1.47e-06	1.08e+08	1.59e+02
CDF					2.54e-05		567.63841
Class 1 frequency = D7-Class3a-Class3b =					1.27e-05		
Class 2 frequency = From Table 5-2 =					2.54e-08		
Class 3a frequency = From Table 5-6 =					3.67e-07		
Class 3b frequency = From Table 5-6 =					2.20e-09		
Class 6 frequency = From Table 5-2 =					4.78e-10		

Class 7 frequency = From Table 5-2 =					1.08e-05		
Class 8 frequency = From Table 5-2 =					1.47e-06		
Class 1 dose = La =				6.73e+04			
Class 2 dose = 100*La/0.5 =				1.35e+07			
Class 3a dose = 25*La =				1.68e+06			
Class 3b dose = 100*La/0.5 =				1.35e+07			
Class 6 dose = 35*La/0.5 =				4.71e+06			
Class 7 dose = 280*La/0.5 =				3.77e+07			
Class 8 dose = Table 5-4 =				1.08e+08			
CCFP = 1 minus (Class 1 plus Class 3a/CDF) =				4.843e-01			
		Table 2 - Mean Consequence Measures for 10 Year Test Interval					
Class	Description				Frequency	Persn-Rem	Persn-Rem
					per Rx-yr		per year
1	No Containment Failure				1.20e-05	6.73e+04	8.07e-01
2	Large Cont Isolation Failures (failure to close)				2.54e-08	1.35e+07	3.42e-01
3a	Small Isolation Failure (Type A test)				1.10e-06	1.68e+06	1.85e+00
3b	Large Isolation Failure (Type A test)				6.60e-09	1.35e+07	8.88e-02
6	Other Isolation Failures (dependent failures)				4.78e-10	4.71e+06	2.25e-03
7	Severe Accident Phenomena (Early and Late)				1.08e-05	3.77e+07	4.07e+02
8	Containment Bypassed (SGTR)				1.47e-06	1.08e+08	1.59e+02
CDF					2.54e-05		568.88128
Class 1 frequency = D7-Class3a-Class3b =					1.20e-05		
Class 2 frequency = From Table 5-2 =					2.54e-08		
Class 3a frequency = From Table 5-6 =					1.10e-06		
Class 3b frequency = From Table 5-6 =					6.60e-09		
Class 6 frequency = From Table 5-2 =					4.78e-10		
Class 7 frequency = From Table 5-2 =					1.08e-05		
Class 8 frequency = From Table 5-2 =					1.47e-06		
CCFP = 1 minus (Class 1 plus Class 3a/CDF) =				4.844e-01			

		Table 3 - Mean Consequence Measures for 15 Year Test Interval					
Class	Description				Frequency	Persn-Rem	Persn-Rem
					per Rx-yr		per year
1	No Containment Failure				1.14e-05	6.73e+04	7.70e-01
2	Large Cont Isolation Failures (failure to close)				2.54e-08	1.35e+07	3.42e-01
3a	Small Isolation Failure (Type A test)				1.65e-06	1.68e+06	2.78e+00
3b	Large Isolation Failure (Type A test)				9.90e-09	1.35e+07	1.33e-01
6	Other Isolation Failures (dependent failures)				4.78e-10	4.71e+06	2.25e-03
7	Severe Accident Phenomena (Early and Late)				1.08e-05	3.77e+07	4.07e+02
8	Containment Bypassed (SGTR)				1.47e-06	1.08e+08	1.59e+02
CDF					2.54e-05		569.81383
Class 1 frequency = D7-Class3a-Class3b =					1.14e-05		
Class 2 frequency = From Table 5-2 =					2.54e-08		
Class 3a frequency = From Table 5-6 =					1.65e-06		
Class 3b frequency = From Table 5-6 =					9.90e-09		
Class 6 frequency = From Table 5-2 =					4.78e-10		
Class 7 frequency = From Table 5-2 =					1.08e-05		
Class 8 frequency = From Table 5-2 =					1.47e-06		
CCFP = 1 minus (Class 1 plus Class 3a/CDF) =				4.846e-01			
		Table 4 - Mean Consequence Measures for 20 Year Test Interval					
Class	Description				Frequency	Persn-Rem	Persn-Rem
					per Rx-yr		per year
1	No Containment Failure				1.09e-05	6.73e+04	7.33e-01
2	Large Cont Isolation Failures (failure to close)				2.54e-08	1.35e+07	3.42e-01
3a	Small Isolation Failure (Type A test)				2.20e-06	1.68e+06	3.70e+00
3b	Large Isolation Failure (Type A test)				1.32e-08	1.35e+07	1.78e-01
6	Other Isolation Failures (dependent failures)				4.78e-10	4.71e+06	2.25e-03
7	Severe Accident Phenomena (Early and Late)				1.08e-05	3.77e+07	4.07e+02
8	Containment Bypassed (SGTR)				1.47e-06	1.08e+08	1.59e+02
CDF					2.54e-05		570.74639

Class 1 frequency = D7-Class3a-Class3b =					1.09e-05		
Class 2 frequency = From Table 5-2 =					2.54e-08		
Class 3a frequency = From Table 5-6 =					2.20e-06		
Class 3b frequency = From Table 5-6 =					1.32e-08		
Class 6 frequency = From Table 5-2 =					4.78e-10		
Class 7 frequency = From Table 5-2 =					1.08e-05		
Class 8 frequency = From Table 5-2 =					1.47e-06		
Delta LERF going from 3 in 10 year test interval to 1 in 15 year test interval =							
Difference in Class 3b frequency =			7.70e-09				
Delta LERF going from 3 in 10 year test interval to 1 in 20 year test interval =							
Difference in Class 3b frequency =			1.10e-08				
Delta LERF going from 1 in 10 year test interval to 1 in 15 year test interval =							
Difference in Class 3b frequency =			3.30e-09				
Delta person-rem/year going from 3 in 10 year test interval to 1 in 15 year interval =							2.1754254
Percentage increase = ((Total15 - Total Base)/Total Base)*100 =						0.38%	
Delta person-rem/year going from 1 in 10 year test interval to 1 in 15 year interval =							0.9325559
Percentage increase = ((Total15 - Total10)/Total10)*100 =					0.16%		
Delta increase in CCFP going from 3 in 10 year test interval to 1 in 15 year interval =							0.03%
Delta increase in CCFP going from 1 in 10 year test interval to 1 in 15 year interval =							0.01%
For a plant with CDF =		1e-04	The previously approved methodology estimates				
Class 3b frequency = 0.021*CDF =			0.0000021				
Class 3b frequency for 10 year interval = 0.021*CDF*1.10 =					0.0000023		
Class 3b frequency for 15 year interval = 0.021*CDF*1.15 =					0.0000024		
Class 3b frequency for 20 year interval = 0.021*CDF*1.2 =					0.0000025		
Delta LERF going from 3 in 10 year test interval to 1 in 15 year test interval =							

Difference in Class 3b frequency =			3.15e-07				
Delta LERF going from 3 in 10 year test interval to 1 in 20 year test interval =							
Difference in Class 3b frequency =			4.20e-07				
Delta LERF going from 10 year test interval to 1 in 20 year test interval =							
Difference in Class 3b frequency =			2.10e-07				
From page 5-19 CEOG topical report estimates delta LERF in going from a 10 year test interval							
to a 20 year test interval to be			3.80e-08				
If data base was 1 large failure out of 145 tests then:							
For a plant with CDF =		1e-04					
Class 3b frequency = 0.033*CDF =			0.0000033				
Class 3b frequency for 15 year interval = 0.033*CDF*1.15 =					0.0000038		
Class 3b frequency for 20 year interval = 0.033*CDF*1.2 =					0.000004		
Delta LERF going from 3 in 10 year test interval to 1 in 15 year test interval =							
Difference in Class 3b frequency =			4.95e-07				
Delta LERF going from 3 in 10 year test interval to 1 in 20 year test interval =							
Difference in Class 3b frequency =			6.60e-07				
Reproduction of Crystal River calculation to extend Type A Test Interval							
From 1 in 10 Years to 1 in 15 Years Using Oconee Plant Specific Data							
CDF =	2.60e-05						
No containment failure frequency =			5.50e-06				
		Table 1 - Baseline Mean Consequence Measures					
Class	Description				Frequency	Persn-Rem	Persn-Rem
					per Rx-yr		per year

1	No Containment Failure				3.29e-06	4.27e+02	1.40e-03
2	Large Cont Isolation Failures (failure to close)				7.09e-08	4.27e+05	3.03e-02
3a	Small Isolation Failure (Type A test)				1.66e-06	4.27e+03	7.11e-03
3b	Large Isolation Failure (Type A test)				5.46e-07	1.49e+04	8.16e-03
6	Other Isolation Failures (dependent failures)				0.00e+00	1.49e+04	0.00e+00
7	Severe Accident Phenomena (Early and Late)				2.01e-05	7.52e+04	1.51e+00
8	Containment Bypassed (SGTR)				4.17e-07	7.51e+05	3.13e-01
CDF					2.61e-05		1.8716314
Class 1 frequency = D7-Class3a-Class3b =					3.29e-06		
Class 2 frequency =					7.09e-08		
Class 3a frequency = .064*CDF=					1.66e-06		
Class 3b frequency = .021*CDF =					5.46e-07		
Class 6 frequency = Included in Class 2 =					0.00e+00		
Class 7 frequency =					2.01e-05		
Class 8 frequency =					4.17e-07		
Class 1 dose = La =				4.27e+02			
Class 2 dose = 1000*La =				4.27e+05			
Class 3a dose = 10*La =				4.27e+03			
Class 3b dose = 35*La =				1.49e+04			
Class 6 dose = 35*La =				1.49e+04			
Class 7 dose =				7.52e+04			
Class 8 dose =				7.51e+05			
CCFP = 1 minus (Class 1 plus Class 3a/CDF) =				8.101e-01			
		Table 2 - Mean Consequence Measures for 10 Year Test Interval					
Class	Description				Frequency	Persn-Rem	Persn-Rem
					per Rx-yr		per year
1	No Containment Failure				3.07e-06	4.27e+02	1.31e-03
2	Large Cont Isolation Failures (failure to close)				7.09e-08	4.27e+05	3.03e-02
3a	Small Isolation Failure (Type A test)				1.83e-06	4.27e+03	7.82e-03
3b	Large Isolation Failure (Type A test)				6.01e-07	1.49e+04	8.98e-03
6	Other Isolation Failures (dependent failures)				0.00e+00	1.49e+04	0.00e+00
7	Severe Accident Phenomena (Early and Late)				2.01e-05	7.52e+04	1.51e+00

8	Containment Bypassed (SGTR)				4.17e-07	7.51e+05	3.13e-01
CDF					2.61e-05		1.8730635
Class 1 frequency = D7-Class3a-Class3b =					3.07e-06		
Class 2 frequency =					7.09e-08		
Class 3a frequency = .064*CDF*1.1 =					1.83e-06		
Class 3b frequency = .021*CDF*1.1 =					6.01e-07		
Class 6 frequency = Included in Class 2 =					0.00e+00		
Class 7 frequency =					2.01e-05		
Class 8 frequency =					4.17e-07		
CCFP = 1 minus (Class 1 plus Class 3a/CDF) =				8.122e-01			
		Table 3 - Mean Consequence Measures for 15 Year Test Interval					
Class	Description				Frequency	Persn-Rem	Persn-Rem
					per Rx-yr		per year
1	No Containment Failure				2.96e-06	4.27e+02	1.26e-03
2	Large Cont Isolation Failures (failure to close)				7.09e-08	4.27e+05	3.03e-02
3a	Small Isolation Failure (Type A test)				1.91e-06	4.27e+03	8.17e-03
3b	Large Isolation Failure (Type A test)				6.28e-07	1.49e+04	9.38e-03
6	Other Isolation Failures (dependent failures)				0.00e+00	1.49e+04	0.00e+00
7	Severe Accident Phenomena (Early and Late)				2.01e-05	7.52e+04	1.51e+00
8	Containment Bypassed (SGTR)				4.17e-07	7.51e+05	3.13e-01
CDF					2.61e-05		1.8737796
Class 1 frequency = D7-Class3a-Class3b =					2.96e-06		
Class 2 frequency =					7.09e-08		
Class 3a frequency = .064*CDF*1.15 =					1.91e-06		
Class 3b frequency = .021*CDF*1.15 =					6.28e-07		
Class 6 frequency = Included in Class 2 =					0.00e+00		
Class 7 frequency =					2.01e-05		
Class 8 frequency =					4.17e-07		
CCFP = 1 minus (Class 1 plus Class 3a/CDF) =				8.132e-01			

		Table 4 - Mean Consequence Measures for 20 Year Test Interval					
Class	Description				Frequency	Persn-Rem	Persn-Rem
					per Rx-yr		per year
1	No Containment Failure				2.85e-06	4.27e+02	1.22e-03
2	Large Cont Isolation Failures (failure to close)				7.09e-08	4.27e+05	3.03e-02
3a	Small Isolation Failure (Type A test)				2.00e-06	4.27e+03	8.53e-03
3b	Large Isolation Failure (Type A test)				6.55e-07	1.49e+04	9.79e-03
6	Other Isolation Failures (dependent failures)				0.00e+00	1.49e+04	0.00e+00
7	Severe Accident Phenomena (Early and Late)				2.01e-05	7.52e+04	1.51e+00
8	Containment Bypassed (SGTR)				4.17e-07	7.51e+05	3.13e-01
CDF					2.61e-05		1.8744957
Class 1 frequency = D7-Class3a-Class3b =					2.85e-06		
Class 2 frequency =					7.09e-08		
Class 3a frequency = .064*CDF*1.2 =					2.00e-06		
Class 3b frequency = .021*CDF*1.2 =					6.55e-07		
Class 6 frequency = Included in Class 2 =					0.00e+00		
Class 7 frequency =					2.01e-05		
Class 8 frequency =					4.17e-07		
Delta LERF going from 3 in 10 year test interval to 1 in 15 year test interval =							
Difference in Class 3b frequency =			8.19e-08				
Delta LERF going from 3 in 10 year test interval to 1 in 20 year test interval =							
Difference in Class 3b frequency =			1.09e-07				
Delta LERF going from 1 in 10 year test interval to 1 in 15 year test interval =							
Difference in Class 3b frequency =			2.73e-08				
Delta person-rem/year going from 3 in 10 year test interval to 1 in 15 year interval =							0.0021482
Percentage increase = ((Total15 - Total Base)/Total Base)*100 =						0.11%	
Delta person-rem/year going from 1 in 10 year test interval to 1 in 15 year interval =							0.0007161
Percentage increase = ((Total15 - Total10)/Total10)*100 =					0.04%		

Delta increase in CCFP going from 3 in 10 year test interval to 1 in 15 year interval =							0.31%
Delta increase in CCFP going from 1 in 10 year test interval to 1 in 15 year interval =							0.10%
For a plant with CDF =		1e-04	The previously approved methodology estimates				
Class 3b frequency = 0.021*CDF =			0.0000021				
Class 3b frequency for 10 year interval = 0.021*CDF*1.10 =					0.0000023		
Class 3b frequency for 15 year interval = 0.021*CDF*1.15 =					0.0000024		
Class 3b frequency for 20 year interval = 0.021*CDF*1.2 =					0.0000025		
Delta LERF going from 3 in 10 year test interval to 1 in 15 year test interval =							
Difference in Class 3b frequency =			3.15e-07				
Delta LERF going from 3 in 10 year test interval to 1 in 20 year test interval =							
Difference in Class 3b frequency =			4.20e-07				
Delta LERF going from 10 year test interval to 1 in 20 year test interval =							
Difference in Class 3b frequency =			2.10e-07				
From page 5-19 CEOG topical report estimates delta LERF in going from a 10 year test interval							
to a 20 year test interval to be			3.80e-08				
If data base was 1 large failure out of 145 tests then:							
For a plant with CDF =		1e-04					
Class 3b frequency = 0.033*CDF =			0.0000033				
Class 3b frequency for 15 year interval = 0.033*CDF*1.15 =					0.0000038		
Class 3b frequency for 20 year interval = 0.033*CDF*1.2 =					0.000004		
Delta LERF going from 3 in 10 year test interval to 1 in 15 year test interval =							
Difference in Class 3b frequency =			4.95e-07				

Delta LERF going from 3 in 10 year test interval to 1 in 20 year test interval =							
Difference in Class 3b frequency =			6.60e-07				