



U.S.NRC

UNITED STATES NUCLEAR REGULATORY COMMISSION

Protecting People and the Environment

Proposed Options to NRC Form 5, “Occupational Dose Record for a Monitoring Period”

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U.S. Nuclear Regulatory Commission



Discussion Topics:

- Changes to 10 CFR Part 20 Reporting Requirements
- Status of Regulatory Guide 8.7
 - Potential revision to NRC Forms 4, “Cumulative Occupational Dose History” and 5, “Occupational Dose Record for a Monitoring Period”
 - Outreach to NRC Stakeholders
 - Proposed Options of NRC Form 5
- Conclusions



Changes to 10 CFR Part 20 Reporting Requirements:

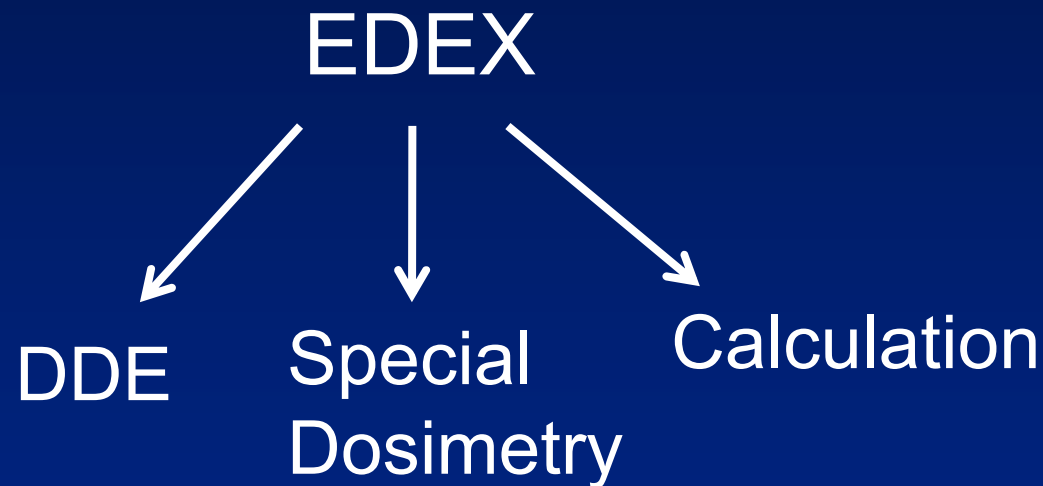
- Federal Register notice concerning changes to Parts 19, 20, and 50 became effective on February 15, 2008
 - No Form 4 required if dose is less than 100 mrem
 - Required per 10 CFR 20.2206
 - No “attempt to obtain” lifetime dose histories
 - Exception – Planned Special Exposure
 - Changes to Total Effective Dose Equivalent (TEDE)
 - Definition change to use EDE (for external exposures) [EDEX] in place of DDE



Regulatory Guide 8.7 Update

- Potential Revision to NRC Forms 4 and 5
 - New Part 20 reporting option of EDE for external exposures
 - Can use EDE for external exposures to calculate TEDE
 - New acronym, **EDEX**, used in Regulatory Guide 8.40
 - **EDEX - Effective Dose Equivalent for eXternal exposures**
- NRC Outreach to Stakeholders
 - March 5, 2010 public meeting with NEI
 - New TEDE definition
 - Feedback on use of current RG and Forms
- Proposed Options for Revised NRC Form 5
 - Include detailed examples of how to fill out NRC Form 5 if using EDEX
 - 3 proposed options

Effective Dose Equivalent for External Exposures (EDEX)



$$\text{EDEX} = \text{DDE} + \text{Special Dosimetry} + \text{Calculation}$$



NRC Form 5 – Example Scenarios

CASE A

A technician wears one whole body dosimeter on his/her collar for the entire monitoring period. The dosimeter results are:

Whole Body Dosimeter = 0.148 rem

CEDE = 0.75 rem

CDE = 1 rem

TEDE = ?

TODE = ?



NRC Form 5 – Option A

NRC FORM 5 DRAFT
(1-2008)
10 CFR PART 20

U.S. NUCLEAR REGULATORY COMMISSION

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OCCUPATIONAL DOSE RECORD FOR A MONITORING PERIOD OPTION A

1. NAME (LAST, FIRST, MIDDLE INITIAL)	2. IDENTIFICATION NUMBER	3. ID TYPE	4. SEX <input type="checkbox"/> MALE <input type="checkbox"/> FEMALE	5. DATE OF BIRTH (MM/DD/YYYY)
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6. MONITORING PERIOD (MM/DD/YYYY – MM/DD/YYYY) —	7. LICENSEE NAME	8. LICENSE NUMBER(S)	9A. <input type="checkbox"/> RECORD <input type="checkbox"/> ESTIMATE	9B. <input type="checkbox"/> ROUTINE <input type="checkbox"/> PSE
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INTAKES				DOSES (in rem)	
10A. RADIONUCLIDE	10B. CLASS	10C. MODE	10D. INTAKE IN μ Ci		
				DEEP DOSE EQUIVALENT (FOR PERIODS WHEN EDEX IS DETERMINED) (DDE)	11. 0.00
				SPECIAL DOSIMETRY	12. 0.00
				EFFECTIVE DOSE EQUIVALENT (FOR EXTERNAL EXPOSURES) (ADD BLOCKS 11 AND 12) (EDEX)	13. 0.00
				DEEP DOSE EQUIVALENT (FOR THE ENTIRE MONITORING PERIOD) (DDE)	14. 0.148
				LENS (EYE) DOSE EQUIVALENT (LDE)	15.
				SHALLOW DOSE EQUIVALENT, WHOLE BODY (SDE,WB)	16.
				SHALLOW DOSE EQUIVALENT, MAX EXTREMITY (SDE,ME)	17.
				COMMITTED EFFECTIVE DOSE EQUIVALENT (CEDE)	18. 0.75
				COMMITTED DOSE EQUIVALENT, MAXIMALLY EXPOSED ORGAN (CDE)	19. 1.00
				TOTAL EFFECTIVE DOSE EQUIVALENT (ADD BLOCKS 13 AND 18) (TEDE)	20. 0.898
				TOTAL ORGAN DOSE EQUIVALENT MAX ORGAN (ADD BLOCKS 11 AND 19) (TODE)	21. 1.148
				22. COMMENTS	

23. SIGNATURE – LICENSEE	24. DATE PREPARED
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NRC Form 5 – Option B

NRC FORM 5 DRAFT
(1-2008)
10 CFR PART 20

U.S. NUCLEAR REGULATORY COMMISSION

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OCCUPATIONAL DOSE RECORD FOR A MONITORING PERIOD OPTION B

1. NAME (LAST, FIRST, MIDDLE INITIAL)		2. IDENTIFICATION NUMBER		3. ID TYPE	4. SEX <input type="checkbox"/> MALE <input type="checkbox"/> FEMALE	5. DATE OF BIRTH (MM/DD/YYYY)
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6. MONITORING PERIOD (MM/DD/YYYY – MM/DD/YYYY) –	7. LICENSEE NAME	8. LICENSE NUMBER(S)	9A. <input type="checkbox"/> RECORD <input type="checkbox"/> ESTIMATE	9B. <input type="checkbox"/> ROUTINE <input type="checkbox"/> PSE
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INTAKES				DOSES (in rem)	
10A. RADIONUCLIDE	10B. CLASS	10C. MODE	10D. INTAKE IN μ Ci		
				EFFECTIVE DOSE EQUIVALENT (FOR EXTERNAL EXPOSURES) (EDEX)	11. 0.148
				LENS (EYE) DOSE EQUIVALENT (LDE)	12.
				SHALLOW DOSE EQUIVALENT, WHOLE BODY (SDE, WB)	13.
				SHALLOW DOSE EQUIVALENT, MAX EXTREMITY (SDE, ME)	14.
				COMMITTED EFFECTIVE DOSE EQUIVALENT (CEDE)	15. 0.75
				COMMITTED DOSE EQUIVALENT, MAXIMALLY EXPOSED ORGAN (CDE)	16. 1.00
				TOTAL EFFECTIVE DOSE EQUIVALENT (ADD BLOCKS 11 AND 15) (TEDE)	17. 0.898
				TOTAL ORGAN DOSE EQUIVALENT MAX ORGAN (TODE)	18. 1.148
				19. COMMENTS	

20. SIGNATURE – LICENSEE	21. DATE PREPARED
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NRC Form 5 – Option C

NRC FORM 5 DRAFT
(1-2008)
10 CFR PART 20

U.S. NUCLEAR REGULATORY COMMISSION

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OCCUPATIONAL DOSE RECORD FOR A MONITORING PERIOD OPTION C

1. NAME (LAST, FIRST, MIDDLE INITIAL)		2. IDENTIFICATION NUMBER		3. ID TYPE	4. SEX <input type="checkbox"/> MALE <input type="checkbox"/> FEMALE	5. DATE OF BIRTH (MM/DD/YYYY)
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INTAKES				DOSES (in rem)	
10A. RADIONUCLIDE	10B. CLASS	10C. MODE	10D. INTAKE IN μ Ci		
				EFFECTIVE DOSE EQUIVALENT (FOR EXTERNAL EXPOSURES) (EDEX)	11. 0.148
				DEEP DOSE EQUIVALENT (FOR THE ENTIRE MONITORING PERIOD) (DDE)	12. 0.148
				LENS (EYE) DOSE EQUIVALENT (LDE)	13.
				SHALLOW DOSE EQUIVALENT, WHOLE BODY (SDE, WB)	14.
				SHALLOW DOSE EQUIVALENT, MAX EXTREMITY (SDE, ME)	15.
				COMMITTED EFFECTIVE DOSE EQUIVALENT (CEDE)	16. 0.75
				COMMITTED DOSE EQUIVALENT, MAXIMALLY EXPOSED ORGAN (CDE)	17. 1.00
				TOTAL EFFECTIVE DOSE EQUIVALENT (ADD BLOCKS 11 AND 16) (TEDE)	18. 0.898
				TOTAL ORGAN DOSE EQUIVALENT MAX ORGAN (ADD BLOCKS 12 AND 17) (TODE)	19. 1.148
				20. COMMENTS	

21. SIGNATURE – LICENSEE	22. DATE PREPARED
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NRC Form 5 – Example Scenarios

CASE B

A technician works in radiology for the year and wears two dosimeters, one on the collar and one under an apron at all times. The licensee uses one of the approved special dosimetry methods (specified in RG 8.40) to analyze the readings of the two dosimeters. The dosimeter results are:

Collar Dosimeter = 0.202 rem

Special Dosimetry = 0.056 rem

CEDE = 0.75 rem

CDE = 1 rem

TEDE = ?

TODE = ?



NRC Form 5 – Option A

NRC FORM 5 DRAFT <small>(1-2009)</small> <small>10 CFR PART 20</small>				U.S. NUCLEAR REGULATORY COMMISSION				<small>Estimated burden per response to comply with this mandatory collection request: 20 minutes. This information is used to ensure that doses to individual do not exceed regulatory limits. This information is required to record/annually report individual occupational exposure to radiation to ensure that the exposure does not exceed regulatory limits. Send comments regarding burden estimate to the Records and FOIA/Privacy Services Branch (T-5 F52), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to infocollects@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202, (3150-0006), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to the information collection.</small>					
OCCUPATIONAL DOSE RECORD FOR A MONITORING PERIOD OPTION A													
1. NAME (LAST, FIRST, MIDDLE INITIAL)				2. IDENTIFICATION NUMBER				3. ID TYPE		4. SEX <input type="checkbox"/> MALE <input type="checkbox"/> FEMALE		5. DATE OF BIRTH (MM/DD/YYYY)	
6. MONITORING PERIOD (MM/DD/YYYY – MM/DD/YYYY)			7. LICENSEE NAME			8. LICENSE NUMBER(S)			9A. <input type="checkbox"/> RECORD <input type="checkbox"/> ESTIMATE		9B. <input type="checkbox"/> ROUTINE <input type="checkbox"/> PSE		
INTAKES				DOSES (in rem)									
10A. RADIONUCLIDE	10B. CLASS	10C. MODE	10D. INTAKE IN μ Ci										
				DEEP DOSE EQUIVALENT (FOR PERIODS WHEN EDEX IS DETERMINED) (DDE)						11. 0.00			
				SPECIAL DOSIMETRY						12. 0.056			
				EFFECTIVE DOSE EQUIVALENT (FOR EXTERNAL EXPOSURES) (ADD BLOCKS 11 AND 12) (EDEX)						13. 0.056			
				DEEP DOSE EQUIVALENT (FOR THE ENTIRE MONITORING PERIOD) (DDE)						14. 0.202			
				LENS (EYE) DOSE EQUIVALENT (LDE)						15.			
				SHALLOW DOSE EQUIVALENT, WHOLE BODY (SDE,WB)						16.			
				SHALLOW DOSE EQUIVALENT, MAX EXTREMITY (SDE,ME)						17.			
				COMMITTED EFFECTIVE DOSE EQUIVALENT (CEDE)						18. 0.75			
				COMMITTED DOSE EQUIVALENT, MAXIMALLY EXPOSED ORGAN (CDE)						19. 1.00			
				TOTAL EFFECTIVE DOSE EQUIVALENT (ADD BLOCKS 13 AND 18) (TEDE)						20. 0.806			
				TOTAL ORGAN DOSE EQUIVALENT MAX ORGAN (ADD BLOCKS 11 AND 19) (TODE)						21. 1.202			
				22. COMMENTS									
23. SIGNATURE – LICENSEE								24. DATE PREPARED					



NRC Form 5 – Option B

NRC FORM 5 DRAFT
(1-2008)
10 CFR PART 20

U.S. NUCLEAR REGULATORY COMMISSION

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OCCUPATIONAL DOSE RECORD FOR A MONITORING PERIOD OPTION B

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INTAKES				DOSES (in rem)	
10A. RADIONUCLIDE	10B. CLASS	10C. MODE	10D. INTAKE IN μ Ci		
				EFFECTIVE DOSE EQUIVALENT (FOR EXTERNAL EXPOSURES) (EDEX)	11. 0.056
				LENS (EYE) DOSE EQUIVALENT (LDE)	12.
				SHALLOW DOSE EQUIVALENT, WHOLE BODY (SDE,WB)	13.
				SHALLOW DOSE EQUIVALENT, MAX EXTREMITY (SDE,ME)	14.
				COMMITTED EFFECTIVE DOSE EQUIVALENT (CEDE)	15. 0.75
				COMMITTED DOSE EQUIVALENT, MAXIMALLY EXPOSED ORGAN (CDE)	16. 1.00
				TOTAL EFFECTIVE DOSE EQUIVALENT (ADD BLOCKS 11 AND 15) (TEDE)	17. 0.806
				TOTAL ORGAN DOSE EQUIVALENT MAX ORGAN (TODE)	18. 1.202
				19. COMMENTS	

20. SIGNATURE – LICENSEE	21. DATE PREPARED
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NRC Form 5 – Option C

NRC FORM 5 DRAFT
(1-2008)
10 CFR PART 20

U.S. NUCLEAR REGULATORY COMMISSION

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OCCUPATIONAL DOSE RECORD FOR A MONITORING PERIOD OPTION C

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INTAKES				DOSES (in rem)	
10A. RADIONUCLIDE	10B. CLASS	10C. MODE	10D. INTAKE IN μ Ci		
				EFFECTIVE DOSE EQUIVALENT (FOR EXTERNAL EXPOSURES) (EDEX)	11. 0.056
				DEEP DOSE EQUIVALENT (FOR THE ENTIRE MONITORING PERIOD) (DDE)	12. 0.202
				LENS (EYE) DOSE EQUIVALENT (LDE)	13.
				SHALLOW DOSE EQUIVALENT, WHOLE BODY (SDE, WB)	14.
				SHALLOW DOSE EQUIVALENT, MAX EXTREMITY (SDE, ME)	15.
				COMMITTED EFFECTIVE DOSE EQUIVALENT (CEDE)	16. 0.75
				COMMITTED DOSE EQUIVALENT, MAXIMALLY EXPOSED ORGAN (CDE)	17. 1.00
				TOTAL EFFECTIVE DOSE EQUIVALENT (ADD BLOCKS 11 AND 16) (TEDE)	18. 0.806
				TOTAL ORGAN DOSE EQUIVALENT MAX ORGAN (ADD BLOCKS 12 AND 17) (TODE)	19. 1.202
				20. COMMENTS	

21. SIGNATURE – LICENSEE	22. DATE PREPARED
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NRC Form 5 – Example Scenarios

CASE C

A technician does some radiology work, wearing a collar dosimeter and a shielded dosimeter. In addition, the technician also does some other work that does not involve wearing a lead apron (such as working with Co-60) and during this work, only the collar dosimeter is worn. The dosimeter results are:

Collar Dosimeter = 0.185 rem

Special Dosimetry = 0.018 rem

Whole Body Dosimeter = 0.140 rem

CEDE = 0.75 rem

CDE = 1 rem

TEDE = ?

TODE = ?



NRC Form 5 – Option A

<p>NRC FORM 5 DRAFT (1-2008) 10 CFR PART 20</p> <p style="text-align: center;">U.S. NUCLEAR REGULATORY COMMISSION</p> <p style="text-align: center;">OCCUPATIONAL DOSE RECORD FOR A MONITORING PERIOD OPTION A</p>				<p>Estimated burden per response to comply with this mandatory collection request: 20 minutes. This information is used to ensure that doses to individual do not exceed regulatory limits. This information is required to record/annually report individual occupational exposure to radiation to ensure that the exposure does not exceed regulatory limits. Send comments regarding burden estimate to the Records and FOIA/Privacy Services Branch (T-5 F52), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to infocollects@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202, (3150-0006), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to the information collection.</p>			
1. NAME (LAST, FIRST, MIDDLE INITIAL)		2. IDENTIFICATION NUMBER		3. ID TYPE	4. SEX <input type="checkbox"/> MALE <input type="checkbox"/> FEMALE	5. DATE OF BIRTH (MM/DD/YYYY)	
6. MONITORING PERIOD (MM/DD/YYYY – MM/DD/YYYY) —		7. LICENSEE NAME		8. LICENSE NUMBER(S)		9A. <input type="checkbox"/> RECORD <input type="checkbox"/> ESTIMATE	9B. <input type="checkbox"/> ROUTINE <input type="checkbox"/> PSE
INTAKES				DOSES (in rem)			
10A. RADIONUCLIDE	10B. CLASS	10C. MODE	10D. INTAKE IN μ Ci				
				DEEP DOSE EQUIVALENT (FOR PERIODS WHEN EDEX IS DETERMINED) (DDE)		11.	0.140
				SPECIAL DOSIMETRY		12.	0.018
				EFFECTIVE DOSE EQUIVALENT (FOR EXTERNAL EXPOSURES) (ADD BLOCKS 11 AND 12) (EDEX)		13.	0.158
				DEEP DOSE EQUIVALENT (FOR THE ENTIRE MONITORING PERIOD) (DDE)		14.	0.185
				LENS (EYE) DOSE EQUIVALENT (LDE)		15.	
				SHALLOW DOSE EQUIVALENT, WHOLE BODY (SDE,WB)		16.	
				SHALLOW DOSE EQUIVALENT, MAX EXTREMITY (SDE,ME)		17.	
				COMMITTED EFFECTIVE DOSE EQUIVALENT (CEDE)		18.	0.75
				COMMITTED DOSE EQUIVALENT, MAXIMALLY EXPOSED ORGAN (CDE)		19.	1.00
				TOTAL EFFECTIVE DOSE EQUIVALENT (ADD BLOCKS 13 AND 18) (TEDE)		20.	0.908
				TOTAL ORGAN DOSE EQUIVALENT MAX ORGAN (ADD BLOCKS 11 AND 19) (TODE)		21.	1.185
				22. COMMENTS			
23. SIGNATURE – LICENSEE						24. DATE PREPARED	



NRC Form 5 – Option B

NRC FORM 5 DRAFT
(1-2008)
10 CFR PART 20

U.S. NUCLEAR REGULATORY COMMISSION

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OCCUPATIONAL DOSE RECORD FOR A MONITORING PERIOD OPTION B

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6. MONITORING PERIOD (MM/DD/YYYY – MM/DD/YYYY) –	7. LICENSEE NAME	8. LICENSE NUMBER(S)	9A. <input type="checkbox"/> RECORD <input type="checkbox"/> ESTIMATE	9B. <input type="checkbox"/> ROUTINE <input type="checkbox"/> PSE
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INTAKES				DOSES (in rem)	
10A. RADIONUCLIDE	10B. CLASS	10C. MODE	10D. INTAKE IN μ Ci		
				EFFECTIVE DOSE EQUIVALENT (FOR EXTERNAL EXPOSURES) (EDEX)	11. 0.158
				LENS (EYE) DOSE EQUIVALENT (LDE)	12.
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				COMMITTED EFFECTIVE DOSE EQUIVALENT (CEDE)	15. 0.75
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20. SIGNATURE – LICENSEE	21. DATE PREPARED
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NRC Form 5 – Option C

NRC FORM 5 DRAFT
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6. MONITORING PERIOD (MM/DD/YYYY – MM/DD/YYYY) —	7. LICENSEE NAME	8. LICENSE NUMBER(S)	9A. <input type="checkbox"/> RECORD <input type="checkbox"/> ESTIMATE	9B. <input type="checkbox"/> ROUTINE <input type="checkbox"/> PSE
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INTAKES				DOSES (in rem)	
10A. RADIONUCLIDE	10B. CLASS	10C. MODE	10D. INTAKE IN μ Ci		
				EFFECTIVE DOSE EQUIVALENT (FOR EXTERNAL EXPOSURES) (EDEX)	11. 0.158
				DEEP DOSE EQUIVALENT (FOR THE ENTIRE MONITORING PERIOD) (DDE)	12. 0.185
				LENS (EYE) DOSE EQUIVALENT (LDE)	13.
				SHALLOW DOSE EQUIVALENT, WHOLE BODY (SDE, WB)	14.
				SHALLOW DOSE EQUIVALENT, MAX EXTREMITY (SDE, ME)	15.
				COMMITTED EFFECTIVE DOSE EQUIVALENT (CEDE)	16. 0.75
				COMMITTED DOSE EQUIVALENT, MAXIMALLY EXPOSED ORGAN (CDE)	17. 1.00
				TOTAL EFFECTIVE DOSE EQUIVALENT (ADD BLOCKS 11 AND 16) (TEDE)	18. 0.908
				TOTAL ORGAN DOSE EQUIVALENT MAX ORGAN (ADD BLOCKS 12 AND 17) (TODE)	19. 1.185
				20. COMMENTS	

21. SIGNATURE – LICENSEE	22. DATE PREPARED
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Conclusions

- NRC outreach to stakeholders continues
 - Public Meeting in Fall/Winter 2010
 - Forms for review and comment on REIRS Web site
 - Stakeholders can suggest other form options
 - Send options to NRC and ORAU
- RG 8.7 Status
 - Text near completion
 - Will include existing Forms 4 and 5
 - OMB renewal package is in process since forms expire in Nov. 2010
 - Renewal package contains language to inform OMB of future changes to forms



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BACKGROUND SLIDES



Protection of Personal Identification Information (PII)

- The Federal Information Security Management Act of 2002 (FISMA)
- Privacy Act of 1974
 - The loss of PII can result in substantial harm, embarrassment, and inconvenience to individuals and may lead to identity theft or other fraudulent use of the information

Use of Social Security Numbers

- Government initiative to move away from use of social security numbers
- Office of Personnel Management (OPM) requested Federal agencies to:
 - Identify systems containing social security numbers or other PII
 - Categorize systems as “Legacy” or “Current”
 - REIRS identified as a “Legacy” system
 - No current NRC action on removing social security numbers from REIRS
 - NRC Form 5 has other identification categories that can be used in place of a social security number
- NRC continues to participate in meetings with OPM
 - Additional activities and information in 2011