



**Health Effects Program:
Technical Support for NRC Programs**

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Health Effects Program

- **Mission**
- **Current Projects**
 - **New and existing reactors**
 - **Materials licensees**
 - **Security**
 - **Emergency preparedness**
- **National and International Activities**
- **Plans for Future Work**

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Health Effects Branch Mission

- **Assess health effects, develop products, and provide technical expertise in support of agency decision making**
 - **Technical bases for regulations**
 - **Computer codes, databases and guidance for regulatory implementation**
- **Monitoring national and international radiation protection activities for possible applicability to NRC programs**

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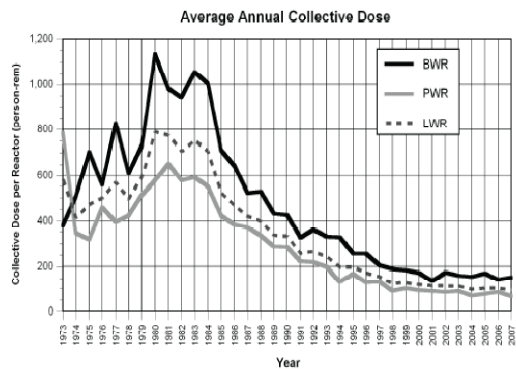


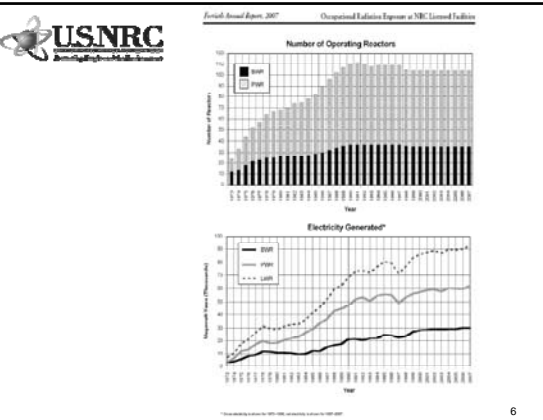
Radiation Exposure Information and Reporting System (REIRS)

- **Purpose:** collect and analyze annual occupational dose information required by 10 CFR 20.2206
- **Primary objectives**
 - Provides former and current employees complete records of occupational exposures received at NRC-licensed facilities
 - Evaluates effectiveness of licensees' ALARA programs and determines effects of transient workers
 - Shared with other nuclear nations for lessons learned and best practices
- **Status**
 - CY 2008 dose data is being submitted by licensees
 - FY 2008 NUREG-0713 report scheduled for publication later this year

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Occupational Radiation Exposure at NRC Licensed Facilities *Fortieth Annual Report, 2007*





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VARSKIN 4

- **Purpose:** computer code for estimating skin dose
- **Primary objectives**
 - Calculates beta dose with certain geometries
 - Replace photon model
 - Quality control
- **Status**
 - Photon dosimetry model is being refined
 - Software infrastructure is changing to update GUI interface
- **Website:** <http://www.nrc.gov/about-nrc/regulatory/research/comp-codes.html#health>

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Current GUI for generating input file

Radionuclide Activity			All Radionuclides		
Initial Dose Rate	Dose Dn	Decay Corrected Dose	Initial Dose Rate	Dose Dn	Decay Corrected Dose
Beta	1.38E-01 mSv/h	1.38E-01 mSv	Beta	1.45E-01 mSv/h	2.48E-01 mSv
Photon	0.00E+00 mSv/h	0.00E+00 mSv	Photon	1.24E-01 mSv/h	1.24E-01 mSv
Total	1.38E-01 mSv/h	1.38E-01 mSv	Total	2.69E-01 mSv/h	3.72E-01 mSv

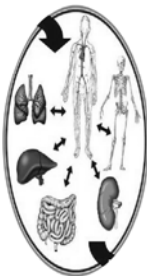
Dose values from output

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Radiation Protection Dosimetry Research

- **Purpose:** provide technical support to NRC programs involving radiation protection dosimetry
- **Primary objectives**
 - Develop methods for implementing new and existing regulatory requirements
 - Provide in-depth technical expertise on a wide range of internal and external dosimetry topics
 - Respond to technical needs of the agency for radiation dosimetry in a timely manner
- **Status**
 - Ongoing technical support on internal dosimetry software, iodine biokinetics, effluent emergency preparedness, etc



USNRC **PIMAL**
Phantom with Moving Arms and Legs

Traditional mathematical phantom

Arms and legs separated and divided into parts to add moving abilities

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USNRC **RADIOLOGICAL TOOLBOX**

A PC-Based Radiological Toolbox
Evaluation of Radiological Exposures and Assessment of Regulatory Compliance
U.S. Nuclear Regulatory Commission

The Radiological Toolbox provides a means whereby the data bases needed for radiation protection calculations.

Office of Nuclear Regulatory Research

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USNRC **Multi-Agency Radiation Survey and Assessment of Materials and Equipment (MARSAME)**

- **Purpose:** provide Federal guidance on acceptable methods for surveying materials and equipment for disposition
- **Primary objectives:**
 - Establish consensus among DoD, DOE, EPA and NRC on acceptable methods for surveying materials and equipment for disposition
 - Publish standardized guidance for investigation of radioactively contaminated sites, material and equipment
- **Status**
 - Published in January 2009
 - Develop training for users

MULTI-AGENCY RADIATION SURVEY AND SITE INVESTIGATION MANUAL (MARSSIM)

MULTI-AGENCY RADIATION SURVEY AND ASSESSMENT OF MATERIALS AND EQUIPMENT MANUAL (MARSAME)



Updated Study on Cancer in Populations Living Near Nuclear Power Facilities

- **Purpose:** provide contemporary information on cancer rates near nuclear power facilities
- **Objectives**
 - Update 1990 National Cancer Institute study results on cancer mortality
 - Explore feasibility of studying cancer *incidence*
- **Status**
 - Project in early stage
 - Plan to complete cancer mortality study and cancer incidence feasibility study in 2011



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National Support

- National Council on Radiation Protection and Measurements
- Interagency Steering Committee on Radiation Standards
- National Academies
- Council on Ionizing Radiation Measurements and Standards

International Support

- United Nations Scientific Committee on the Effects of Atomic Radiation
- International Commission on Radiological Protection
- International Atomic Energy Agency
- Organization for Economic Cooperation and Development - Nuclear Energy Agency

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Plans for Future Work

- Continue to serve as technical resource for health effects and radiation protection activities
- Develop additional tools for NRC staff and licensee use
- Expand knowledge management initiatives
- Your thoughts?

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