U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

RADIATION PROTECTION COMPUTER CODE ANALYSIS AND MAINTENANCE PROGRAM

RADIATION PROTECTION COMPUTER CODE ANALYSIS AND MAINTENANCE PROGRAM

2019 FALL USERS MEETING

UNITED STATES NUCLEAR REGULATORY COMMISSION, THREE WHITE FLINT NORTH
OCTOBER 28 - NOVEMBER 01, 2019

Welcome to the 2019 Fall RAMP Users' Meeting

NRC, Director of Nuclear Regulatory Research (RES)

Welcome to the fourth domestic Radiation Protection Computer Code Analysis and Maintenance Program (RAMP) Users' Meeting, sponsored by the U.S. Nuclear Regulatory Commission (NRC). NRC's Office of Nuclear Regulatory Research (RES) leads RAMP and is your host for this meeting. We are pleased that you could join us for this important meeting and for collaboration to enhance nuclear and radiation safety.

In addition to RAMP, RES plans, recommends, manages, and implements applied research, confirmatory analyses, standards development, and resolution of generic safety issues for nuclear power plants and other facilities regulated by the NRC. RES partners with other NRC offices, Federal agencies, industry research organizations, international organizations, and universities to achieve our mission. We employ a wide variety of talented and diverse experts in engineering and scientific disciplines, including radiation protection, thermal-hydraulics, severe accident progression, nuclear materials, human factors and human reliability, fire protection, seismology, environmental transport, and probabilistic risk assessment. Our experts provide the technical support, analytical tools, and information necessary to accomplish NRC's nuclear safety and security mission.

Besides RAMP, RES also coordinates domestic and international cooperative nuclear safety research activities, including cooperative code-sharing programs for the following areas:

- thermal hydraulics, called the Code Applications and Maintenance Program (CAMP)
- severe accidents, called the Cooperative Severe Accident Research Program (CSARP).

The NRC is pleased to host the third domestic RAMP Users' Meeting. U.S. and international participants in the meeting will contribute to and benefit from the collaborative exchange of information and ideas on radiation protection codes. We look forward to your active participation.

Raymond Furstenau
Director of Nuclear Regulatory Research
U. S. Nuclear Regulatory Commission

Supported by the Office of International Programs

Meeting participants,

I would like to add my welcome to the RAMP Users Meeting on behalf of the NRC's Office of International Programs. Engaging with our RAMP colleagues on radiation protection, dose assessment, and emergency response analysis is just one of the many ways the NRC works to ensure the safety and security of nuclear materials around the globe. These efforts are critically important as the world becomes more interconnected and interest grows in the use of nuclear technologies.

The NRC's international activities support the agency's domestic mission, as well as broader U.S. domestic and international interests. Our international work includes implementation of treaties and conventions, nuclear nonproliferation, and export-import licensing for nuclear materials and equipment. We also provide support and assistance for safeguards, safety cooperation and assistance, exchange of regulatory and safety information, and cooperative safety research. These activities provide the NRC the opportunity to share as well as learn best practices for regulatory safety and security.

RAMP is one of the important initiatives through which we engage with domestic and international colleagues. The success of our regulatory program is bolstered by strong partnerships such as the RAMP users' group. Our Commission's International Policy Statement recognizes the importance of such partnerships and the benefits they bring to the regulatory programs of the both NRC and our international counterparts.

Thank you for coming and contributing your expertise to our partnership. We look forward to working with you over the course of this week

Nader Mamish
Director, Office of International Programs
U.S. Nuclear Regulatory Commission

NRC, Radiation Protection Branch Chief

RAMP meeting participants,

I am pleased to welcome you to the Radiation Protection Computer Code Analysis and Maintenance Program (RAMP) Fall 2019 Users Group Meeting at the U.S. Nuclear Regulatory Commission (NRC) in Washington, DC. I am the Chief of the Radiation Protection Branch, and my team of dedicated staff leads this effort at the NRC. We have worked very hard to bring you a thought-provoking and informative RAMP meeting.

As you know, RAMP is a computer code management program that supports development and maintenance of radiation and dose assessment codes. Our goals are to do the following:

- streamline and prioritize technical updates
- incorporate the latest accepted state-of-the-art models
- achieve consistency in documentation
- implement a consistent software quality assurance program
- leverage fiscal resources and technical expertise
- respond to RAMP user needs

This year, we are excited to bring several mini-symposiums and new training sessions to the meeting. In addition to the VARSKIN technical meeting, we have a non-light water reactor technical session and internal dosimetry training. The RESRAD sessions include presentations from NRC and our international counterparts on the use of the RESRAD codes and other decommissioning issues.

In addition to the RAMP program, my branch is responsible for several regulatory activities. We develop, perform, and manage research programs supporting risk-informed regulatory decision-making in radiation protection at nuclear power plants, materials facilities and users, and fuel cycle facilities. We serve as an agency-wide resource by providing technical support in all aspects of radiation protection to program offices, as well as to the NRC's domestic and international regulatory and scientific counterparts. We develop and maintain computer codes for assessment of radiation doses to workers and members of the public, analyze and report worker exposure to Congress and other stakeholders, and execute research in radiation dosimetry and health studies. We also promote and participate in knowledge management activities within the agency in radiation protection.

We are glad you are here, and we continue to encourage other organizations to join. It is our belief that through RAMP forums and user meetings, participants can make connections and exchange information on radiation protection issues. During the session breaks, take the time to get to know us and create those network connections to further the collaborative exchange of information. We want to hear from you so that we can make RAMP the best program possible.

John J. Tomon
Chief, Radiation Protection Branch
U. S. Nuclear Regulatory Commission

Key Note Speaker

Dr. Kemal Pasamehmetoglu has been with the Idaho National Laboratory (INL) since 2004, currently serving as the Executive Director for the Versatile Test Reactor (VTR). Previously he served as the Associate Laboratory Director for the Nuclear Science & Technology Directorate between 2012 and 2017. He was instrumental in the launch of the Gateway for Accelerated Innovation in Nuclear (GAIN) initiative and initially served as the director for GAIN after its inception. Kemal also served as the national technical director (NTD) for Advanced Fuels Research and Development in the Advanced Fuel Cycle Initiative while also serving as the Nuclear Fuels and Materials Division Director at INL between 2005 and 2012.

During his tenure as a fuels and materials division director and as an NTD he has focused on transforming nuclear fuels research and development capabilities in the nation and at INL into world leading endeavors. Prior to his time at INL, he held senior technical leadership positions at Los Alamos National Laboratory where he worked between 1986 and 2004. He started his career working on light water reactor safety research. He holds a doctorate in mechanical engineering from the University of Central Florida.

Meet the NRC RAMP Team

NRC RAMP Team

Stephanie Bush-Goddard, Ph.D.
RAMP Program Manager

Vered Shaffer, Ph.D.
RAMP Program Manager

Minh-Thuy Nguyen
RAMP Program Team

Jeff Kowalczik, CHP
RAMP Program Team

Gita Samaddar
RAMP Program Team

Pacific Northwest National Laboratory (PNNL) RAMP Team

Bruce McDowell

PNNL RAMP Program Manager

Michael Smith, CHP

PNNL RAMP Program Team

Lubov Lavrentiev

PNNL RAMP Project Coordinator

Leidos RAMP Team

Daniel Pomykala

Leidos RAMP Program Manager

Wendy Chinchilla

Leidos RAMP Website Technical Lead

Jason Luttrell

Leidos RAMP Website Developer

Frederic Gooding

Leidos RAMP Operations Support

Radiation Protection Computer Code Analysis and Maintenance Program (RAMP)

2019 Fall Users Group Meeting, October 28 - November 01, 2019
United States Nuclear Regulatory Commission
3 White Flint North (3WFN), 11601 Lansdowne Street, North Bethesda, MD 20852
Two White Flint North (2WFN), 11545 Rockville Pike, Rockville, MD 20852
RAMP Website: https://ramp.nrc-gateway.gov/

Monday **October 28, 2019**	8:00 AM – 9:00 AM	Registration and Check-In (3WFN 1C03/1C05)			
	9:00 AM – 12:00 PM	Opening Remarks, Tour of Operation Center (3WFN 1C03/05 & Emergency Response Tour)			
	1:00 PM – 4:30 PM	RASCAL (2WFN PDC 3D04)	VARSKIN Training (3WFN 1C03/05)	RESRAD (2WFN PDC 3D02)	
	6:00 PM – 7:30 PM	RAMP Meeting Social Night (City Perch Kitchen + Bar)			
Tuesday **October 29, 2019**	8:00 AM – 8:45 AM	Morning Primer: ATMO Codes (3WFN 1C03/05)			
	9:00 AM – 12:00 PM 1:00 PM – 5:00 PM	RASCAL (2WFN PDC 3D04)	NRCDose3 (2WFN PDC 3B80)	VARSKIN Technical Meeting (3WFN 1C03/05)	RESRAD (2WFN PDC 3D02)
Wednesday **October 30, 2019**	8:00 AM – 8:45 AM	Morning Primer: RADTRAN (3WFN 1C03/05)			
	9:00 AM – 12:00 PM	RASCAL (2WFN PDC 3D04)	NRCDose3 Code Discussions (2WFN PDC 3B80)	VARSKIN Technical Meeting (3WFN 1C03/05)	RESRAD (2WFN PDC 3D02)
	12:00 PM – 1:00 PM	International Lunch Meeting (3WFN 1C03/05)			
	1:15 PM – 5:00 PM	RAMP Tours at NIH			
Thursday **October 31, 2019**	8:00 AM – 8:30 AM	Registration for the Non-LWR HP Technical Meeting (3WFN 1C03/05)			
	8:30 AM – 12:00 PM 1:00 PM – 5:00 PM	Non-LWR HP Technical Meeting including RADTRAD Code Discussions (3WFN 1C03/05)	Internal Dosimetry IMBA Code (2WFN PDC 3B60)	RASCAL Code Open Discussions (2WFN PDC 3D04)	
Friday **November 01, 2019**	8:00 AM – 8:45 AM	Morning Primer: Open Discussions with Code Developers (3WFN 1C03/05)			
	9:00 AM – 11:00 AM	RADTRAD Code Discussions for Int'l Users (3WFN 1C03/05)	Country2Country Discussions (Room To Be Announced)		
	11:00 AM – 12:00 PM	RAMP Closing Remarks and Ceremony (3WFN 1C03/05)			

Opening Agenda

2019 Fall RAMP Users Meeting — Opening Session

8:00 – 9:00 AM	Open Registration	
9:00 – 9:05 AM	Opening and Housekeeping	Vered Shaffer, Ph.D. NRC RAMP Program Manager
9:05 – 9:10 AM	Welcome	Ray Furstenau, Director Office of Nuclear Regulatory Research
9:10 – 9:25 AM	NRC's Cooperative Research with Domestic and International Partners	Kim Webber, Deputy Director Division of Systems Analysis
9:25 – 9:40 AM	Vision for the Future of RAMP	John Tomon, Chief Radiation Protection Branch
9:40 – 10:10 AM	RAMP Keynote Speaker	Kemal Pasamehmetoglu, Ph.D. Idaho National Laboratory
10:10 – 10:20 AM	RAMP Codes Overview & What's New?	Vered Shaffer, Ph.D. NRC RAMP Program Manager
10:20 – 10:30 AM	RAMP User Meeting Information & Roll Call	Stephanie Bush-Goddard, Ph.D. NRC RAMP Program Manager
10:30 – 11:15 AM	Emergency Response Tour Group 1	Jeff Kowalczik, CHP Emergency Response Coordinator
10:30 – 11:15 PM	RAMP Meet & Greet with the Code Developers / Networking (Group 2)	RAMP Group 2
11:15 – 12:00 PM	Emergency Response Tour Group 2	Jeff Kowalczik, CHP Emergency Response Coordinator
11:15 – 12:00 PM	RAMP Meet & Greet with the Code Developers / Networking (Group 1)	RAMP Group 1

VARSKIN Technical Session Agenda

Monday, October 28, 2019

8:00 – 12:00 PM	RAMP Opening Session	
12:00 – 1:00 PM	Lunch	
1:30 – 4:30 PM	VARSKIN Training Session	Anspach, Mangini & Hamby Renaissance Code Development
6:00 – 7:30 PM	RAMP Social Night (sponsored by Renaissance Code Development)	

Tuesday, October 29, 2019

8:00 – 8:45 AM	Morning Primer – Atmospheric Codes	
9:00 – 9:15 AM	Introductions	Vered Shaffer, Ph.D. NRC, VARSKIN Program Manager
9:15 – 9:45 AM	New and Coming Features in VARSKIN	David Hamby, Ph.D. Renaissance Code Development
9:45 – 10:15 AM	Methods of VARSKIN Software Modernization and Quality Assurance	Jeff Luitjens Renaissance Code Development
10:15 – 10:30 AM	Break	
10:30 – 11:00 PM	GI Dose Assessment from Hot Particle Using VARSKIN	Peter Lee & Bill Lin NRC Region III
11:00 – 11:30 PM	Hot Particle Dosimetry Using VARSKIN for Internal Deposition	Shlomi Halfon NRC Foreign Assignee Israeli Atomic Energy Commission
11:30 – 12:00 PM	VARSKIN Parametric Uncertainty/Sensitivity Analysis	Logan Anspach Renaissance Code Development
12:00 – 1:30 PM	Lunch	
1:30 – 2:00 PM	Application of Skin/Hand Dose Limits in Australia	Blake Orr Australian Radiation Protection and Nuclear Safety Agency

2:00 – 2:30 PM	VARSKIN - Challenges Associated w/ Calculating Skin Dose Due to Embedded Contamination	Tosh Ushino & Mutty Sharfi WJM Companies
2:30 – 3:00 PM	Implementation of a VARSKIN Eye Dosimetry Model	David Boozer Oregon State University
3:00 – 3:30 PM	Break	
3:30 – 4:00 PM	Beta Skin Dosimetry Using Passivated Planar Silicon Detector	Modeste Tchouaso, North Carolina A&T State University
4:00 – 4:30 PM	Nasal Cavity Dose Estimates Using VARSKIN and Penelope	Colby Mangini Renaissance Code Development

Wednesday, October 30, 2019

8:00 – 8:45 AM	Morning Primer – RADTRAN	
9:00 – 9:30 AM	Historical Regulatory Perspective of Skin Dosimetry	Mike Lafranzo NRC Region III
9:30 – 10:00 AM	Illinois EMA 2018 Analysis of Quantum Pendant using VARSKIN	Larry Haskell Illinois Emergency Management Agency
10:00 – 10:30 AM	VARSKIN Neutron Dosimetry Model	Logan Anspach Renaissance Code Development
10:30 – 10:45 AM	Break	
10:45 – 11:15 AM	Comparison of VARSKIN Mod 2 and VARSKIN 6.2.1 Dose Conversion Factors	Suzanne Lundie Canadian Nuclear Laboratories
11:15 – 11:30 AM	IT Hurdles: A Government Agency's Perspective	David Hamby, Ph.D. Renaissance Code Development
11:30 – 12:00 PM	Open Discussion on VARSKIN Code Development and Closing Comments	David Hamby, Ph.D. Renaissance Code Development

Non-LWR Technical Session Agenda

Thursday, October 31, 2019

8:30 – 8:40 AM	Introductory Remarks	Stephanie Bush-Goddard NRC, Office of Nuclear Regulatory Research
8:40 – 8:45 AM	Welcome	Kimberly Webber NRC, Office of Nuclear Regulatory Research
8:45 – 9:00 AM	NRC Strategic Non-LWR Vision	John Segala NRC, Office of Nuclear Reactor Regulations
9:00 – 9:15 AM	Overview of Radiological Protection Requirements	John Tomon, NRC, Office of Nuclear Regulatory Research
9:15 – 9:30 AM	Advanced Reactors: Regulatory History (Gap 2011)	Bruce McDowell Pacific Northwest National Laboratory
9:30 – 10:15 AM	Advanced Reactors: Historical Perspectives on Radiological Protection HTGR, MSR, LMFR and Micro/Mobile Considerations	John Kelly, Former American Nuclear Society President
10:15 – 10:30 AM	Break	
10:30 – 10:45 AM	Australia's Regulatory Framework for the New Reactor Designs	Blake Orr Australian Radiation Protection and Nuclear Safety Agency
10:45 – 11:05 AM	Industry's Initiative for Remote Maintenance	Nick Smith, Southern Company
11:05 – 11:25 PM	Decommissioning in Australia	Blake Orr Australian Radiation Protection and Nuclear Safety Agency
11:15 – 11:35 AM	Transportation and Environmental	Donald Palmrose NRC, Office of Nuclear Material Safety and Safeguards
11:25 – 11:40 AM	Emergency Planning and Response	Eric Schrader NRC, Office of Nuclear Security and Incident Response

11:40 – 12:00 PM	Morning Wrap-Up	Stephanie Bush-Goddard NRC, Office of Nuclear Regulatory Research
12:00 – 1:00 PM	Lunch	
1:00 – 1:15 PM	Decommissioning for Non-LWR	Dan Forsyth NRC, Office of Nuclear Material Safety and Safeguards
1:15 – 1:30 PM	ARCON96 Considerations	Jeremy Rishel Pacific Northwest National Laboratory
1:30 – 1:45 PM	Definitive Screening Designs for Near Field Scenarios Using ARCON96	Kenneth Redus, Pittsburgh-Technical, LLC
1:45 – 2:00 PM	RAMP Code Suite (Future Code Consolidation for Non-LWRs)	Stephanie Bush-Goddard NRC, Office of Nuclear Regulatory Research
2:00 – 2:20 PM	Networking Break	
2:20 – 4:00 PM	RADTRAD and HP challenges with Non-LWR Designs	Michelle Hart - NRC Kairos Power Terra Power Oklo, Inc. X-energy
4:00 – 4:15 PM	Path Forward: GALE, NRCDOSE and an Integrated Source Term	Richard Clement NRC, Office of Nuclear Reactor Regulations
4:15 – 4:45 PM	Gap Analysis of Radiation Protection Software	Shaheen Azim Dewji Texas A&M University
4:45 – 5:00 PM	Wrap Up and Closing Remarks	John Tomon, NRC, Office of Nuclear Regulatory Research

RESRAD Technical Session Agenda

Monday, October 28, 2019

1:00 – 4:30 PM	RESRAD-ONSITE Training	Charlie Yu, Ph.D. Emmanuel Gnanapragasam, Ph.D. Argonne National Laboratory

Tuesday, October 29, 2019

9:00 – 12:00 PM	RESRAD-BUILD Training	Charlie Yu, Ph.D. Emmanuel Gnanapragasam, Ph.D. Argonne National Laboratory
1:00 – 5:00 PM	RESRAD-OFFSITE Training	Charlie Yu, Ph.D. Emmanuel Gnanapragasam, Ph.D. Argonne National Laboratory

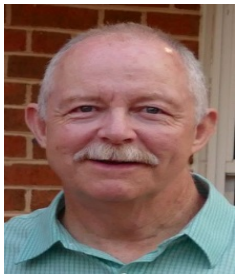
Wednesday, October 30, 2019

9:00 – 9:20 AM	Introductory Remarks & GENII Updates	Caitlin Condon, Ph.D. Pacific Northwest National Laboratory
9:20 – 9:40 AM	Reactor Decommissioning Process	John Clements NRC, Office of Nuclear Material Safety and Safeguards
9:40 – 10:00 AM	How NRC Uses RESRAD in Reviews	Karen Pinkston / Adam Schwartzman, NRC, Office of Nuclear Material Safety and Safeguards
10:00 – 10:15 AM	Break	
10:15 – 10:35 AM	RESRAD Decommissioning Examples	Mike Lafranzo NRC, Region III
10:35 – 10:55 AM	Decommissioning in South Africa	Shumani Masia-Raivhogo, National Nuclear Regulator, South Africa
10:55 – 11:15 PM	Decommissioning in Australia	Blake Orr Australian Radiation Protection and Nuclear Safety Agency
11:15 – 11:35 AM	Biota from An Academic Perspective	Caitlin Condon, Ph.D. Pacific Northwest National Laboratory
11:35 – 12:00 PM	RESRAD User Meeting Wrap-up	Mike Lafranzo NRC Region III

Presentation Descriptions

RASCAL Training

Instructors:

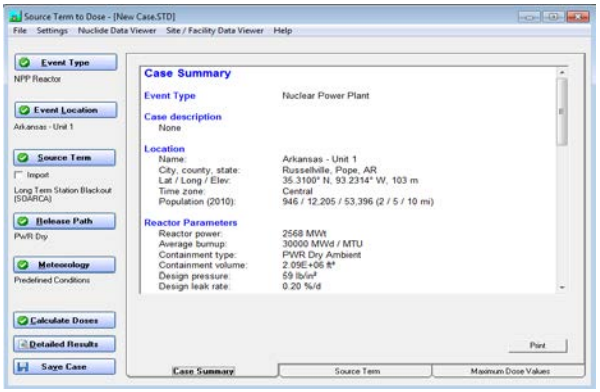


George Athey

Athey Consulting

Jeff Kowalczik, CHP

NRC



The Radiological Assessment System for Consequence AnaLysis (RASCAL) computer code is an emergency response software used to assess off-site consequences from a radiological release incident at a nuclear power plant or materials facility. This training course is a hands-on computer class for new and experienced RASCAL users using the current version of the code (RASCAL v4.3.2). It guides users through simulated release scenarios to develop an understanding of the RASCAL models, inputting data, and interpreting results.

Course Requirements:

- Attendees must provide their own laptop computer with RASCAL 4.3.3 installed prior to the start of the meeting.
- Before taking the course, all attendees should complete the online courses "Introduction to RASCAL" and "RASCAL Fundamentals" available on the RASCAL Training & Presentation page of the RAMP website.

VARSKIN Training

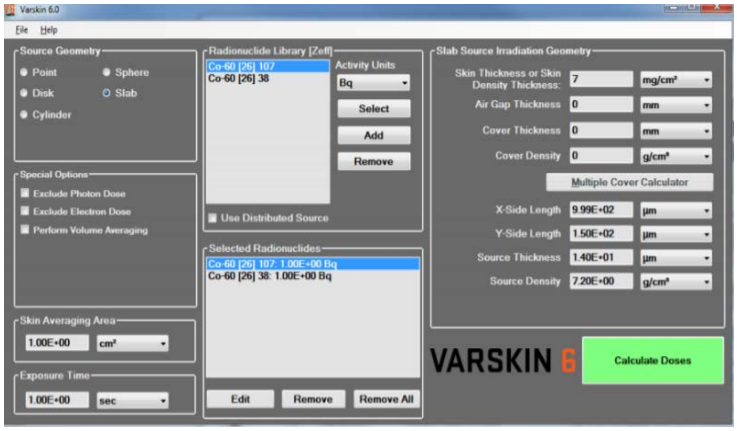
Instructors:

David Hamby, Ph.D.

Renaissance Code Development, LLC (RCD)

Colby Mangini, Ph.D.

Renaissance Code Development, LLC (RCD)



VARSKIN is a computer code for calculating skin dose. VARSKIN assesses compliance with the dose criteria of Title 10 of the Code of Federal Regulations (10 CFR) Part 20, "Standards for Protection against Radiation." The code is used to perform confirmatory calculations of licensees' submittals regarding skin dose (from both electron and photon emissions) estimates at any skin depth or skin volume, with point, disk, cylindrical, spherical, or slab (rectangular) sources, and even enables users to compute doses from multiple sources.

Course Requirements:

- Attendees must provide their own laptop computer with the current version of VARSKIN installed prior to the start of the meeting.
- Before taking the course, all attendees should complete the online course "Introduction to VARSKIN."

VARSKIN

RENAISSANCE CODE DEVELOPMENT

RESRAD Training

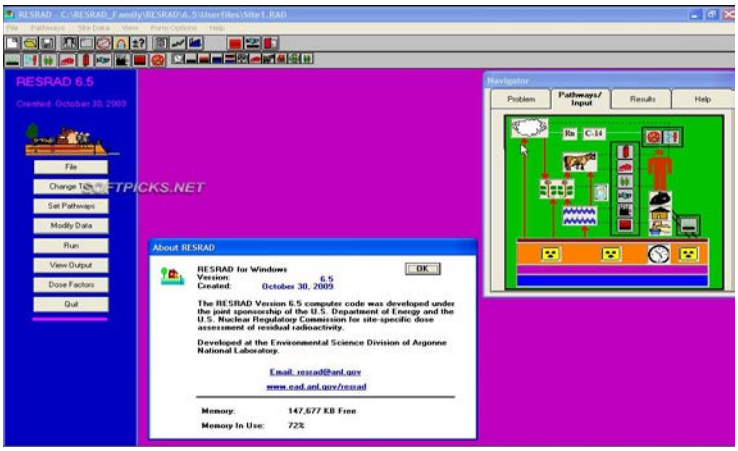
Instructors:

Charley Yu, Ph.D.

Argonne National Laboratory (ANL)

Emmanuel Gnanapragasam, Ph.D.

Argonne National Laboratory (ANL)



The **RES**idual **RAD**ioactive (RESRAD) family of codes are used to analyze potential human and biota radiation exposures from the environmental contamination of residual radioactive materials. The codes use pathway analysis to evaluate radiation exposure and associated risks, and to derive cleanup criteria or authorized limits for radionuclide concentrations in the contaminated source medium. The RESRAD-BIOTA computer code evaluates radiation exposures of nonhuman biota in a terrestrial or aquatic ecosystem. Radiation exposures to biota in a terrestrial or aquatic ecosystem are considered to result from contaminated soil, water, and sediment, which subsequently result in contamination in air and in different food sources. A graded approach that consists of three tiers of analysis is implemented in the RESRAD-BIOTA code. The workshop will focus on demonstrations of the new advanced applications and realistic decontamination and decommissioning scenarios for a variety of facility types and sites, including actual decontamination and decommissioning experiences for NRC licensed facilities.

Course Requirements:

- Attendees must provide their own laptop computer with the RESRAD family of codes installed prior to the start of the meeting.

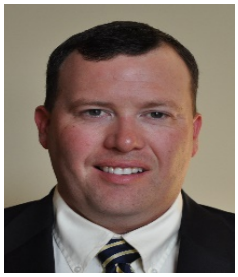
Argonne NATIONAL LABORATORY

NRCDose3 Training

Instructors:

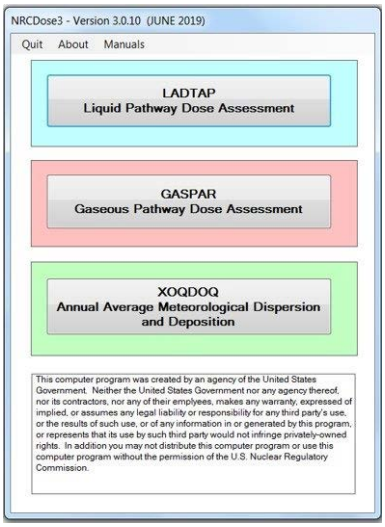
J. Stewart Bland, CHP

Chesapeake Nuclear Services, Inc. (CNS)



Duane DeMore

Chesapeake Nuclear Services, Inc. (CNS)



NRCDose is a user-friendly graphical user interface (GUI) for the LADTAP Il, GASPAR II, and XOQDOQ programs which operate under all Microsoft Windows™ platforms. These Fortran codes implement NRC's current requirements for As Low As Reasonably Achievable (ALARA) for radioactive effluents from nuclear power plants. NRCDose3 is the most recent version of the code which includes an updated GUI, an expanded radionuclide library to include 203 radionuclides with an expanded library of dose conversion factors (DCF) (i.e. ICRP-2 [Default], ICRP-30 or ICRP-72) and updated ICRP-72 DCFs for six age groups (infant, 1 yr., 5 yr., 10 yr., 15 yr., and adult), and fully user-modifiable parameters for the LADTAP II, GASPAR II, and XOQDOQ Fortran codes.

Course Requirements:

- Attendees must provide their own laptop computer with the NRCDose3 code installed prior to the start of the meeting.

IMBA

Instructor:

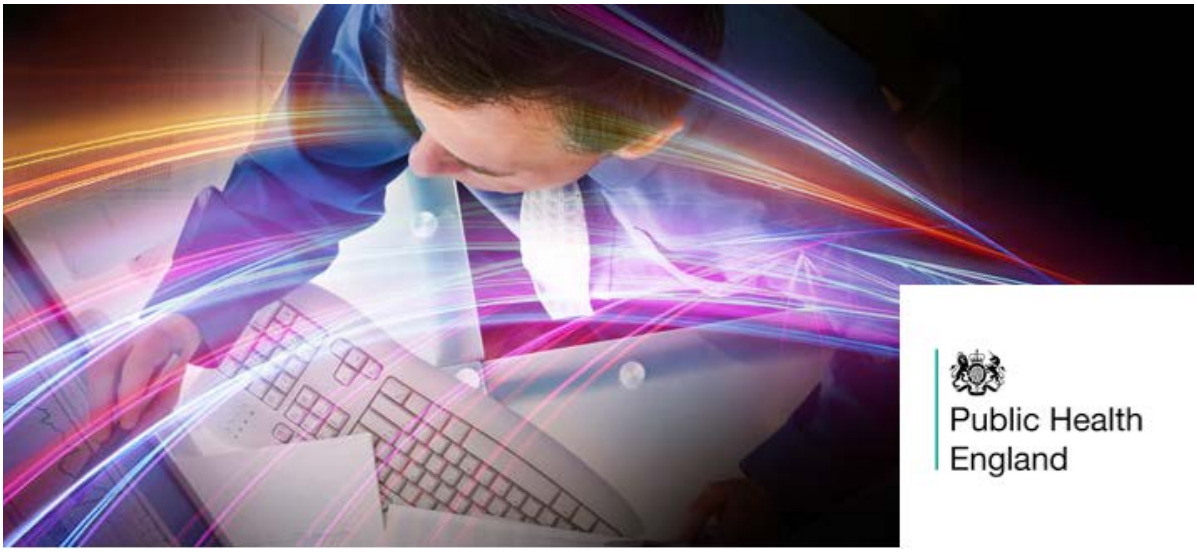
Richard Brey, Ph.D., CHP

Idaho State University

IMBA® (Integrated Modules for Bioassay Analysis) suite of software modules for internal dosimetry implements all the biokinetic and dosimetric models recommended by the International Commission on Radiological Protection (ICRP). Users can specify their own parameter values and apply sophisticated data handling techniques to their customized internal dose calculations. The new IMBA software is available in three standard versions, IMBALite, IMBAPlus and IMBAPro. These cover the entire range of user functionality, which for earlier versions of IMBA required the purchase of a Base Unit and a selection of add-ons.

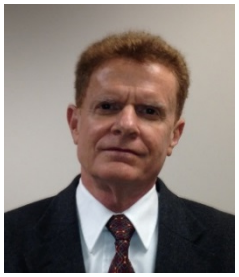
Course Requirements:

- Attendees will be working on standalone laptops with IMBA installed on them.
- Attendees must have fundamental knowledge of internal dosimetry.



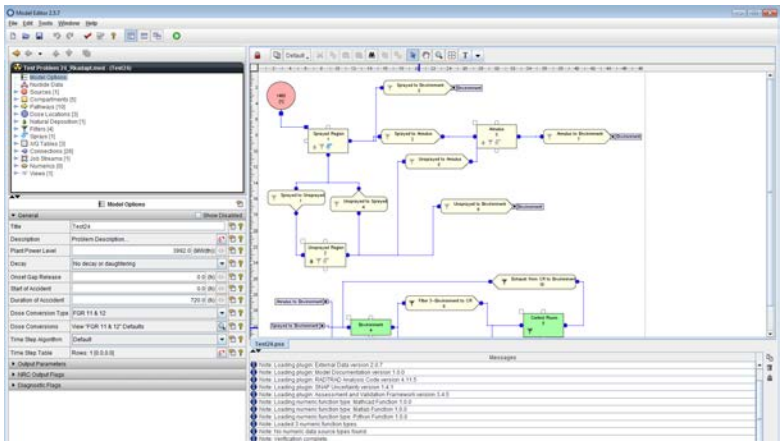
SNAP/RADTRAD Code Overview

Presenter:



William Arcieri

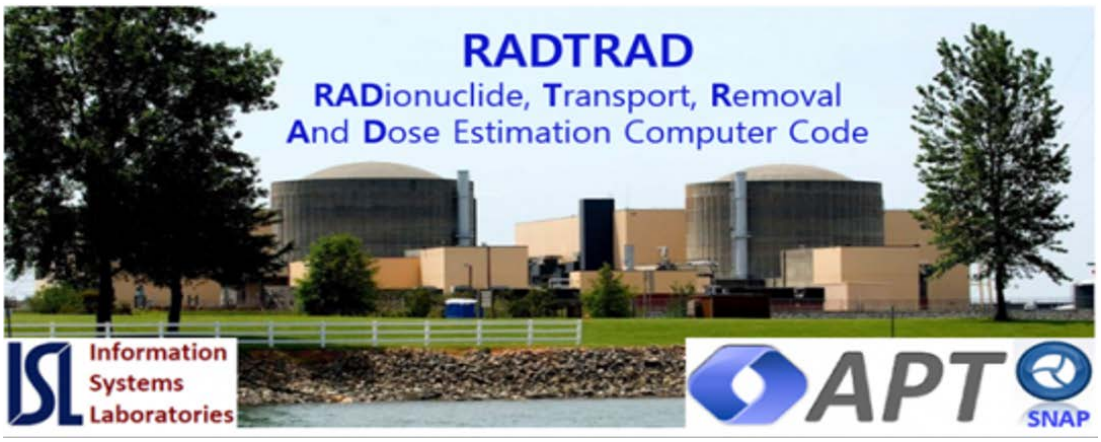
Information Systems Laboratories, Inc. (ISL)



This is overview of the Symbolic Nuclear Analysis Package/RADionuclide Transport, Removal, And Dose Estimation (SNAP/RADTRAD) computer code. SNAP/RADTRAD, was developed for the NRC Office of Nuclear Reactor Regulation (NRR), and is used as a licensing analysis code to show compliance with nuclear plant siting criteria for the radiation doses at the exclusion area boundary (EAB) and the low population zone and to assess the occupational radiation doses in the control room or emergency offsite facility for various loss-of-coolant accidents (LOCA) and non-LOCA design-basis accidents (DBAs). This code overview will cover the current RADTRAD models, and future code development.

Course Requirements:

- Attendees must have knowledge of SNAP/RADTRAD.



RAMP Meeting Tours

Tours of the NRC Operations Center

Date: Monday, October 28, 2019
Where: 3WFN North Bethesda, M.D.

Attendees are invited to experience the inner workings of the NRC Operations Center where the agency coordinates events involving NRC-licensed facilities or materials.

This session will be offered concurrently with some of the training sessions and will emphasize select incident response assets, including Radiological Assessment System for Consequence AnaLysis (RASCAL). It also will address the roles and responsibilities of various teams that comprise the NRC response organization when it is staffed during an emergency. This session will further address the resources the NRC uses when communicating information to external stakeholders and receiving information from licensees during an emergency. Photo identification is required.

Tours of the NRC Operations Center will commence at the end of the RAMP User Meeting Opening Session.

National Institutes of Health

Date: Wednesday, October 30, 2019
Where: Bethesda, M.D.

The National Institutes of Health (NIH) was founded in the late 1870s and is now part of the U.S. Department of Health and Human Services. The NIH is the primary agency of the United States government responsible for biomedical and public health research. The NIH's mission is to seek fundamental knowledge about the nature and behavior of living systems and the application of that knowledge to enhance health, lengthen life, and reduce illness and disability. (Source: www.nih.gov)

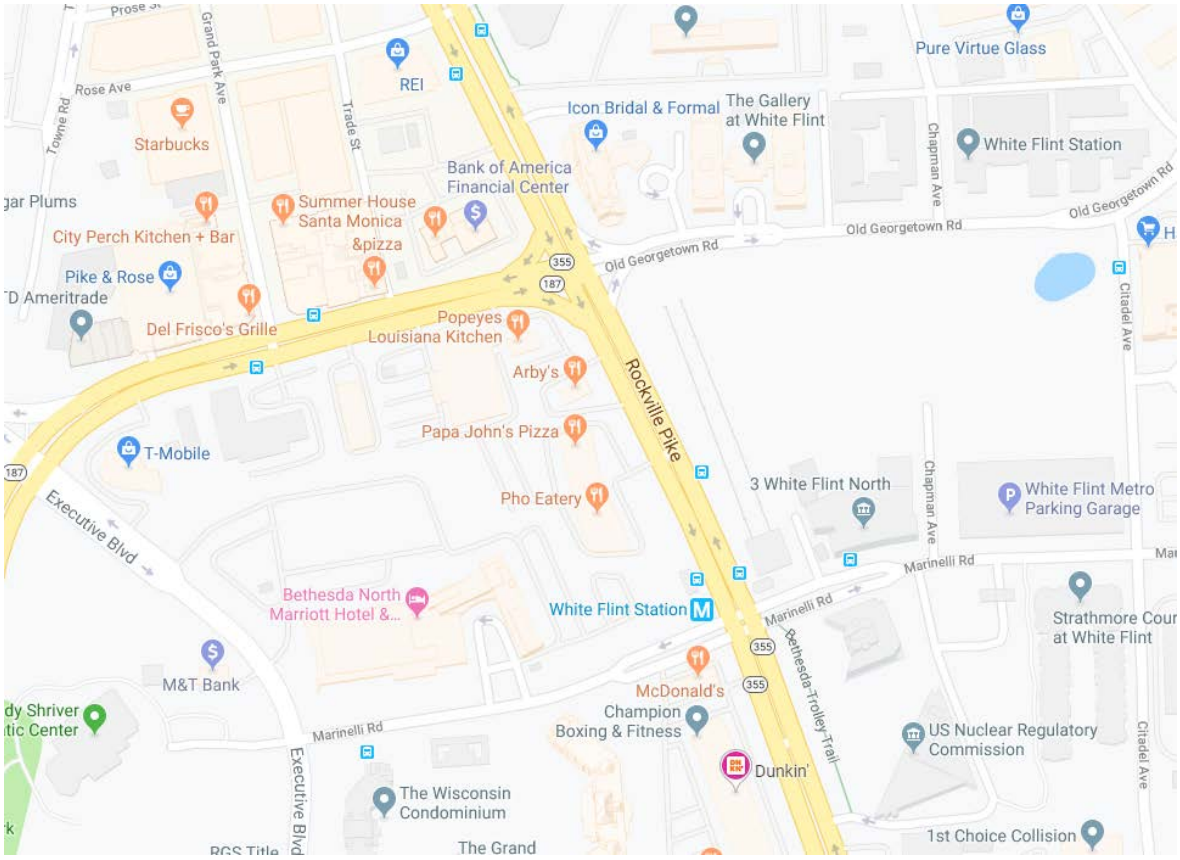
- All participants are to wear closed-toe shoes.

NIH Tour Schedule

1:15 PM	Meet at the 3WFN Lobby
1:45 PM	Arrival at NIH
2:15 PM	Visit Building 21 – Presentation: "A History of Radiation Science at NIH"
2:45 – 3:45 PM	Molecular Imaging Program, NIH Cyclotron, Nuclear Medicine and PET department tours
3:45 – 4:15 PM	Visit 1-2 specifically chosen NIH labs (Hot Cell user groups - based on history/potential for skin contamination)
4:30 – 4:45 PM	Visit the Building 21 Radioactive Waste Facility
4:45 – 5:00 PM	Wrap Up
5:00 PM	Depart from NIH
6:00 PM	Optional dinner out

National Institutes of Health

RAMP Social Night



Nearby Dining (est. walking time)

Metro Pike Center (2-5 minutes) – Across the Street

Restaurant	Address	Type	Phone
➢ Dunkin Donuts	11530 Rockville Pike	Coffee/Donuts	301-231-6516
➢ Sweet Frog	11520 Rockville Pike	Frozen Yogurt	301-881-6100
➢ Taipei Tokyo Cafe	11510 Rockville Pike	Asian/Sushi	301-881-8388
➢ Stella's Bakery	11510 Rockville Pike	European	301-231-9026
➢ Pizza Boli's	11540 Rockville Pike	Italian/Pizza	301-230-0123

Pike & Rose (10 minutes) – North of NRC

Restaurant	Address	Type	Phone
➢ &pizza	11626 Old Georgetown Rd	Pizza	240-621-7016
➢ Bibibop	11584 Old Georgetown Rd	Asian Fusion	301-337-9465
➢ Burgerfi	11881 Grand Park Ave	American	240-669-7244
➢ Chipotle	11802 Rockville Pike	Mexican	240-292-7466
➢ City Perch	11830 Grand Park Ave	American	301-231-2310
➢ Commonwealth Indian	11610 Old Georgetown Rd	Indian	240-833-3055
➢ Del Frisco's Grille	11800 Grand Park Ave	Steakhouse	301-881-0308
➢ Fogo de Chao	11600 Old Georgetown Rd	Brazilian	301-841-9200
➢ Jinya Ramen Bar	910 Prose St	Japanese	301-816-3029
➢ Julii	11915 Grand Park Ave	Mediterranean	301-517-9090
➢ Kusshi	11826 Trade St	Sushi/Japanese	240-770-0355
➢ Nada	11886 Grand Park Ave	Mexican	301-770-4040
➢ Nando's	922 Rose Ave	South African	240-660-5050
➢ Owens Ordinary	11820 Trade St	American	301-245-1226
➢ Pinstripes	11920 Grand Park Ave	Italian-American	240-630-3222
➢ Roti	11584 Old Georgetown Rd	Mediterranean	301-881-7300
➢ Stella Barra	11825 Grand Park Ave	Pizzeria	301-770-8609
➢ Summer House	11825 Grand Park Ave	New American	301-881-2381
➢ Sweetgreen	11875 Grand Park Ave	Salad/Grain Bowl	301-433-7600
➢ Starbucks	11860 Grand Park Ave	Coffee shop	301-770-9096
➢ Sunday Morning Bakehouse	11869 Grand Park Ave	Bakery	

➢ Tutti Frutti	11802 Rockville Pike	Frozen Yogurt,	301-881-7590
➢ The Baked Bear	929 Rose Ave	Ice Cream Bar	858-886-7433

White Flint Station (2-5 minutes) – Across the Street

Restaurant	Address	Type	Phone
➢ Pho Eatery	11618 Rockville Pike	Vietnamese	240-669-9777
➢ Mediterranean House of Kabob	11616 Rockville Pike	Mediterranean	301-881-5956
➢ Ize's Deli and Bagelry	11622 Rockville Pike	American Deli	301-231-0771
➢ Papa John's	11638 Rockville Pike	Pizza	301-816-4800

North Bethesda Market (10-15 minutes) – South of NRC

Restaurant	Address	Type	Phone
➢ Jimmy John's	11416 Rockville Pike	Sandwiches	301-881-1733
➢ China Garden	11333 Woodglen Dr	Chinese	301-816-2800
➢ Seasons 52	11414 Rockville Pike	New American	301-984-5252
➢ Starbucks	11416 Rockville Pike	Coffee Shop	301-230-9898

Other Places

Name	Address	Phone	Est. Walking Time
➢ McDonald's	11564 Rockville Pike	301-230-9640	01 Min
➢ Arby's	11710 Rockville Pike	301-468-6981	05 Min
➢ Popeyes Louisiana Kitchen	11720 Rockville Pike	301-881-5803	06 Min
➢ Quincy's South Bar & Grille	11401 Woodglen Dr	240-669-3270	05 Min
➢ Flor De Luna	11417 Woodglen Dr	240-242-4066	05 Min

Market/Grocery/Convenient Stores

Store Name	Address	Phone	Est Walking Time
➢ Harris Teeter	11845 Old Georgetown Rd	301-468-3029	03 Min
➢ Whole Foods	11355 Woodglen Dr	301-984-4880	06 Min
➢ 7-Eleven	11530 Rockville Pike	301-468-1126	01 Min
➢ CVS Pharmacy	11416 Rockville Pike	301-230-9898	05 Min

THINGS TO DO IN NORTH BETHESDA, ROCKVILLE, AND WASHINGTON, DC

For information on places to go and things to do in North Bethesda, MD:
http://www.americantowns.com/md/northbethesda

For information on places to go and things to do in Rockville, MD:
http://www.americantowns.com/md/rockville

For information on places to go and things to do in downtown Washington, DC:
http://washington.org, http://visitdc.com

Notes

THANK YOU FOR ATTENDING

THE 2019 FALL USERS GROUP MEETING

Monday, October 28 – Friday, November 01, 2019

For additional information:

Email:

RAMP@nrc.gov

RAMP.Admin@pnnl.gov

RAMP Website:

https://ramp.nrc-gateway.gov