



INTERNATIONAL RAMP AND MACCS 2024 FALL USER GROUP MEETING

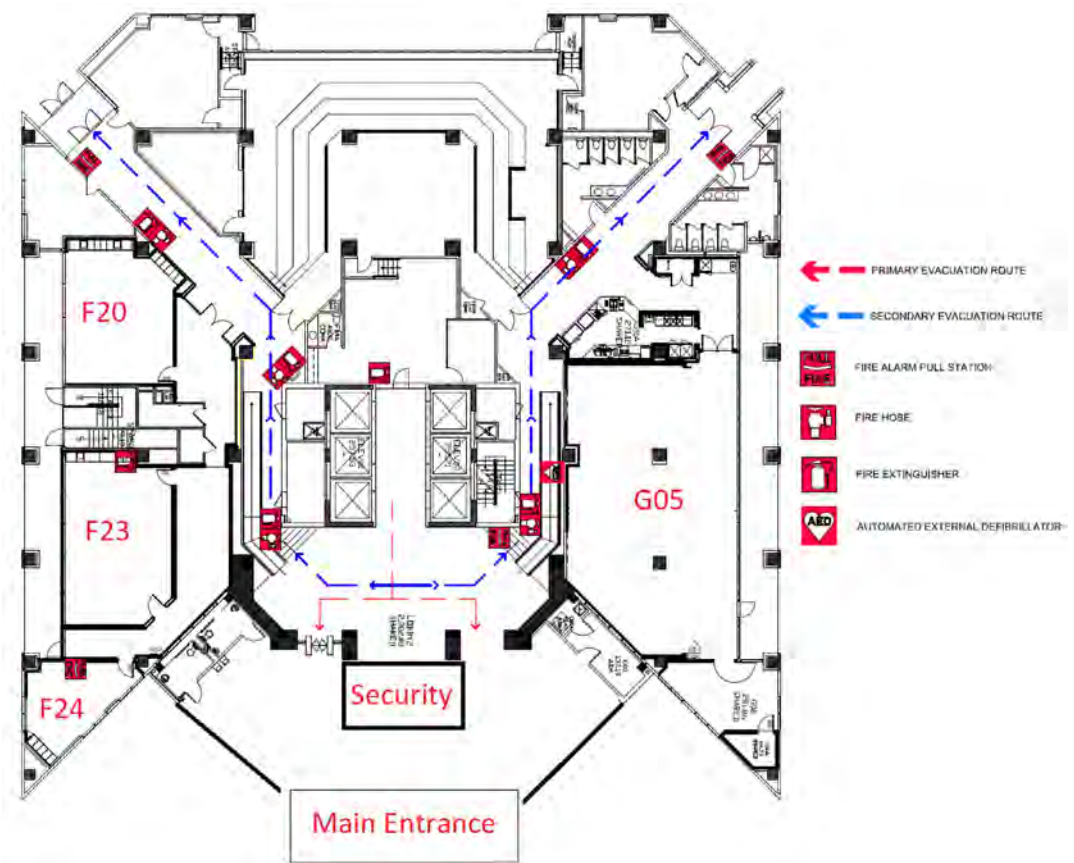
OCTOBER 21–25, 2024

United States Nuclear Regulatory Commission
One White Flint North Bethesda, Maryland





OWFN – 1ST FLOOR MAP AND EVACUATION PLAN



EMERGENCY EVACUATION ROUTE AND ASSEMBLY LOCATIONS



CONNECT

Network: NRC Guest
Password: Gu3stP@ss4eV@!



QR Code for Guest Wi-Fi

WELCOME TO THE FALL 2024 RAMP AND IMUG JOINT MEETING



John Tappert

(Acting) Director of Nuclear
Regulatory Research

U. S. Nuclear Regulatory Commission

Welcome to the joint Radiation Protection Computer Code Analysis and Maintenance Program (RAMP) and International MACCS User Group (IMUG) Meeting. IMUG is part of the Cooperative Severe Accident Research Program (CSARP) and we are pleased that you are joining us for this joint meeting and for collaboration to enhance nuclear and radiation safety. RAMP and IMUG are important initiatives through which we engage with domestic and international colleagues. The success of our regulatory program is bolstered by strong partnerships facilitated by these code user groups.

In addition to RAMP and IMUG, the Office of Nuclear Regulatory Research (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 this User Meeting and we look forward to collaboration with all attendees. Engaging with our colleagues 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. We look forward to your active participation.

MEET THE NRC RAMP AND MACCS TEAMS

NRC RAMP Team



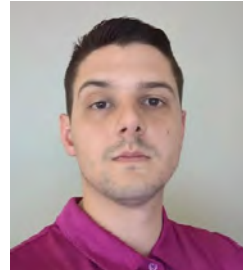
John Tomon
BRANCH CHIEF



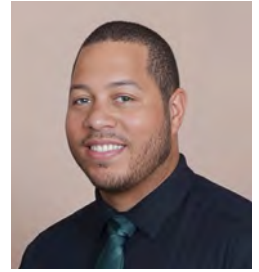
Dr. Stephanie Bush-Goddard
SENIOR RAMP
PROGRAM MANAGER



Marcos Vicente
RAMP MANAGER



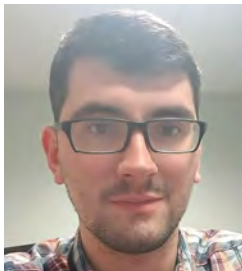
Rigel Flora
RAMP TEAM



Brian Allen
RAMP TEAM



Dr. Sam Hanson
RAMP TEAM



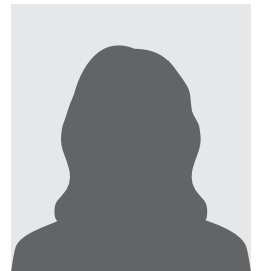
Sam Edwards
RAMP TEAM



Don Lowman
RAMP TEAM



Dr. Casper Sun
RAMP TEAM



Kerstun Norman
RAMP TEAM

NRC MACCS Team



Luis Betancourt
BRANCH CHIEF



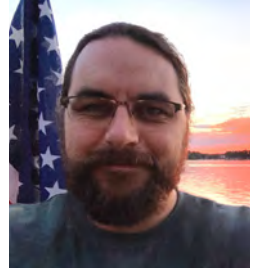
Dr. Keith Compton
MACCS TEAM



Dr. Tina Ghosh
MACCS TEAM



Dr. Salman Haq
MACCS TEAM



Dr. AJ Nosek
MACCS TEAM



Dr. Nazila Tehrani
MACCS TEAM



Dr. Elena Yegorova
MACCS TEAM

MEET THE PNNL AND LEIDOS RAMP TEAM

Pacific Northwest National Laboratory (PNNL) RAMP Team



Dr. Vered Shaffer
PNNL RAMP
PROGRAM MANAGER



Dr. Colby Mangini
PNNL RAMP
PROGRAM TEAM



Dr. Jon Napier
PNNL RAMP
PROGRAM TEAM



Dr. Josh Hargraves
PNNL RAMP
PROGRAM TEAM



Julia Flaherty
PNNL RAMP
PROGRAM TEAM



Luba Hamilton
PNNL RAMP
PROJECT COORDINATOR



Carli Ramos
PNNL RAMP
PROJECT COORDINATOR

LEIDOS RAMP Team



Wendy Chinchilla
LEIDOS RAMP
PROGRAM MANAGER



Frederic Gooding
LEIDOS RAMP
OPERATIONS SUPPORT

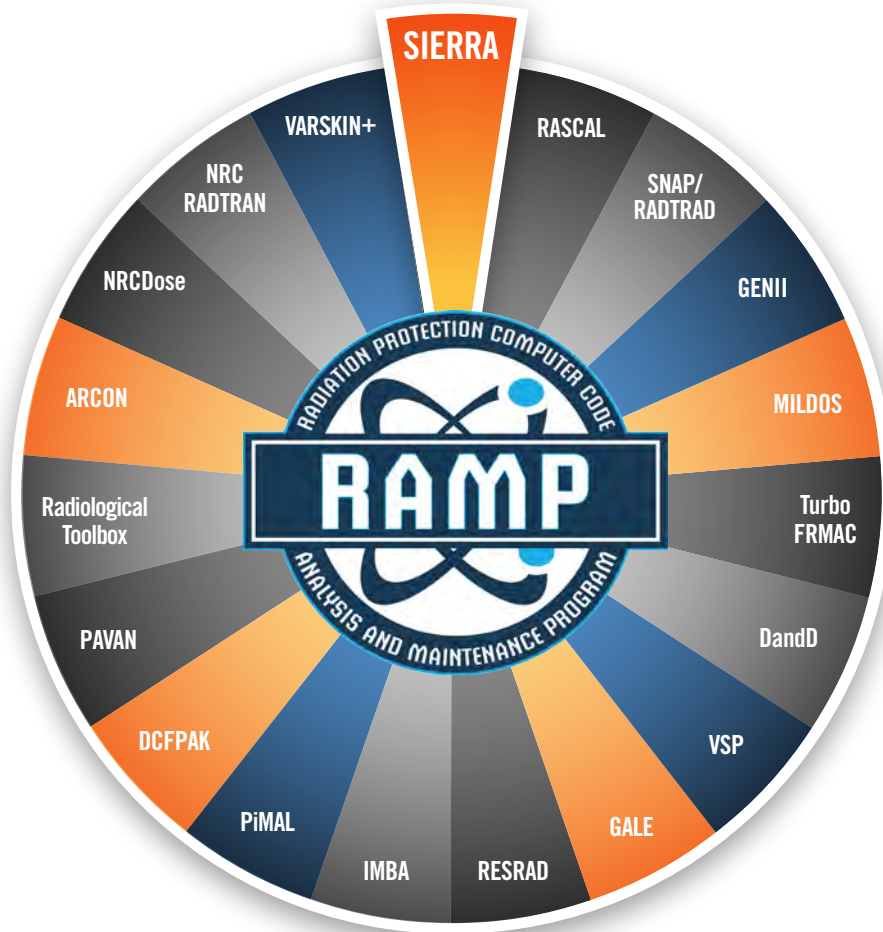


Eric Zimmerman
LEIDOS RAMP
WEBSITE DEVELOPER



Venukumar Devandla
LEIDOS RAMP
DRUPAL DEVELOPER

RAMP CODES



DOSE ASSESSMENT CODES IN RAMP

<https://ramp.nrc-gateway.gov/codes>

SCHEDULE AT-A-GLANCE (All times are in EDT)

Day 1 | Monday, October 21

8:00 AM–8:30 AM

Registration (TWFN Auditorium)

8:30 AM–11:30 AM

Symposium: Radiation Consequence Codes Used in a Regulatory Framework Part 1 (Hybrid/TWFN Auditorium)

11:30 AM–12:00 PM

Headquarters Operations Center Tour (Optional: OWFN Lobby)

12:00 PM–1:00 PM

Lunch (On your own)

1:00 PM–5:00 PM

RASCAL Beginner (In-person/TWFN Auditorium)

Clean Air Act Assessment Package – 1988 Overview
(Hybrid/OWFN G05A and G05B)

5:00 PM–7:00 PM

Social Hour (In-person)

DAY 2 | Tuesday, October 22

8:00 AM–9:00 AM

Primer: SIERRA Overview (Hybrid/TWFN Auditorium)

9:00 AM–11:30 AM

Symposium: Radiation Consequence Codes Used in the Regulatory Framework Part 2 (Hybrid/TWFN Auditorium)

11:30 AM–12:00 PM

Headquarters Operations Center Tour (Optional: OWFN Lobby)

12:00 PM–1:00 PM

Lunch (On your own)

1:00 PM–5:00 PM

MACCS Workshop I
(In-person/TWFN Auditorium)

RASCAL Intermediate/Advanced
(In-person/OWFN G05A and G05B)

SIERRA ATD
(Hybrid/OWFN F23)

DAY 3 | Wednesday, October 23

8:00 AM–9:00 AM

Primer: Overview of MELCOR/SCALE non-LWR Source Term and Fuel Cycle (Hybrid/TWFN Auditorium)

9:00 AM–12:00 PM

MACCS: Presentations I (Hybrid/TWFN Auditorium)

NRC Dose Overview (Hybrid/OWFN G05A and G05B)

12:00 PM–1:00 PM

Lunch (On your own) and **International Luncheon** (In-person/OWFN G05A and G05B)

1:00 PM–5:00 PM

National Institute of Standards and Technology (NIST) Tour (Optional: OWFN Lobby)

6:00 PM–8:00 PM

No Host Dinner (Optional)

Day 4 | Thursday, October 24

8:00 AM–9:00 AM

Primer: Artificial Intelligence at NRC (TWFN Auditorium)

9:00 AM–12:00 PM

MACCS Presentations II
(Hybrid/TWFN Auditorium)

Dosimetry Symposium (VARSKIN, IMBA, PiMAL)
(Hybrid/OWFN G05A and G05B)

RADTRAN (Hybrid/OWFN F23)

12:00 PM–1:00 PM

Lunch (On your own)

1:00 PM–4:30 PM

MACCS Workshop II
(In-person/TWFN Auditorium)

Dosimetry Symposium (VARSKIN, IMBA, PiMAL)
(Hybrid/OWFN G05A and G05B)

RAMP Open Code Discussion
(In-person/OWFN F23)

4:30 PM–5:00 PM

Closing Ceremony (TWFN Auditorium)

Day 5 | Friday, October 25

9:00 AM–11:00 AM

RAMP and MACCS User Admin Meetings (Optional)

Optional Code Discussions (OWFN F23)

Optional RAMP Country to Country Meetings (OWFN F20)

Optional MACCS Meetings
(OWFN G05A and G05B)

AGENDA FOR RADIATION CONSEQUENCE CODES USED IN A REGULATORY FRAMEWORK (All times are in EDT)

Monday, October 21	
8:30 AM–8:45 AM	Welcome/Housekeeping , Marcos Vicente, NRC
8:45 AM–8:50 AM	Welcome , Kim Webber, NRC
8:50 AM–9:20 AM	Overview of RAMP Codes and their Regulatory Applications , Stephanie Bush-Goddard, NRC
9:20 AM–9:50 AM	Overview of the MACCS Code and its Regulatory Applications , AJ Nosek, NRC
9:50 AM–10:00 AM	Break
10:00 AM–10:30 AM	Safety Reviews and Codes , Michelle Hart and Zach Gran, NRC
10:30 AM–11:00 AM	Environmental Reviews and Codes , Don Palmrose, NRC
11:00 AM–11:30 AM	Environmental Protection Agency Clean Air Act Code , Brian Littleton, EPA
11:30 AM–11:40 AM	User Meeting Logistics , Vered Shaffer, PNNL
11:40 AM	Tour of the Headquarters Operations Center , (Group A)
11:40 AM–12:00 PM	Questions and Answers (All)
Tuesday, October 22	
9:00 AM–9:10 AM	Welcome , Marcos Vicente, NRC
9:10 AM–9:30 AM	Medical Activities and Codes , Brian Allen, NRC
9:30 AM–10:00 AM	Emergency Response Planning , Jeff Kowalczyk, NRC
10:00 AM–10:10 AM	Break
10:10 AM–10:30 AM	Cost Benefit Analysis , Tina Ghosh, NRC
10:30 AM–11:00 AM	Emergency Planning and Response/Research , Todd Smith, NRC
11:00 AM–11:30 AM	Licensing Modernization Process and 10 CFR Part 53 , Anders Gilbertson, NRC
11:30 AM–11:40 AM	Open Code Discussions , Vered Shaffer, PNNL
11:40 AM	Tour of the Headquarters Operations Center , (Group B)
11:40 AM–12:00 PM	Questions and Answers (All)

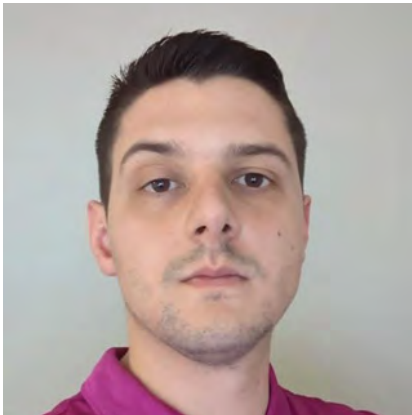
AGENDA FOR MACCS OVERVIEW (All times are in EDT)

Tuesday, October 22	
1:00 PM–5:00 PM	MACCS Workshop I Dan Clayton and Mariah Garcia (<i>In-person/TWFN Auditorium</i>)
Wednesday, October 23, 2024	
9:00 AM–12:00 PM	MACCS Presentations I (<i>Hybrid/TWFN Auditorium</i>)
9:00 AM–9:30 AM	Overview of MACCS Status and Development – October 2024 , Dan Clayton
9:30 AM–10:00 AM	Use of National Centers for Environmental Prediction (NCEP) Data to Support Severe Accident Consequence Analysis at Locations Without Onsite Meteorological Data , Dan Clayton and Mariah Garcia
10:00 AM–10:30 AM	Investigating the Impact of Applying Different Grid Resolutions of NWP Data in Probabilistic Accident Consequence Assessments , Peter Bedwell
10:35 AM–11:00 AM	Assessment of Current MACCS Capabilities for Modeling Atmospheric Physical and Chemical Transformations , Mariah Garcia
11:00 AM–11:30 AM	Current Status of Modeling Optimization Studies on Radiological Consequence Analyses At KAERI , Sung-yeop Kim and Seunghwan Kim
11:30 AM–12:00 PM	COMIDA food-chain model in MACCS: Assumptions and Limitations , Osvaldo Pensado
Thursday, October 24, 2024	
9:00 AM–12:00 PM	MACCS Presentations II (<i>Hybrid/TWFN Auditorium</i>)
9:00 AM–9:30 AM	A Study on Radiological Consequence Analysis Using Agent-Based Protective Action Modeling , Gibeom Kim and Sung-yeop Kim
9:30 AM–10:00 AM	Alternative Methodology for Determining the Efficacy of Iodine Thyroid Blocking , Jia Hao Tang and Sung-yeop Kim
10:00 AM–10:30 AM	Impact of Sex and Age on Prospective Off-Site Health Risk Assessments of Radiological Accidents at Nuclear Sites , Tom Charnock
10:30 AM–11:00 AM	Evaluation of Dose Coefficients Implemented in MACCS , Audrey Nguyen
11:00 AM–12:00 PM	Demo: MACCS-UI/SecPop/Fogbugz/Download Site , Dan Clayton and Mariah Garcia
12:00 PM–1:00 PM	Lunch (<i>On your own</i>)
1:00 PM–4:30 PM	MACCS Workshop II , Dan Clayton and Mariah Garcia (<i>In-person/TWFN Auditorium</i>)

AGENDA FOR RAMP DOSIMETRY SYMPOSIUM (All times are in EDT)

Thursday, October 24	
9:00 AM–9:30 AM	Overview of the Day and Introduction to PiMAL , David Hamby, RCD Software
9:30 AM–10:00 AM	New PiMAL 6.0 w/ Examples , Jeff Luitjens, RCD Software
10:00 AM–10:30 AM	Break
10:30 AM–11:00 AM	IMBA Overview – The Bioassay Tool , Roland Benke, RCD Software
11:00 AM–11:30 AM	ONLINE: A Comparison of VARSKIN+ and Geant4 for Skin Dose Calculations , Gregory James, University Hospitals of North Midlands, UK NHS
11:30 AM–12:00 PM	ONLINE: Needlesticks and Implications for the WoundDose Module , Bill Thomson, Sandwell and West Birmingham Hospitals, UK NHS
12:00 PM–1:00 PM	Lunch
1:00 PM–1:30 PM	Comparative Analysis of the VARSKIN + Dosimetry Modules , David Hamby, RCD Software
1:30 PM–2:00 PM	ONLINE: Comparisons of V+ EyeDose and new Eye Dose Calculators , Jacques Dubeau, DETEC
2:00 PM–2:30 PM	New VARSKIN + Module on Extravasation Dosimetry , Roland Benke, RCD Software
2:30 PM–3:00 PM	Break
3:00 PM–3:20 PM	Calculation of Dose Coefficients for Discrete Radioactive Particles Using VARSKIN + , David Hamby, RCD Software
3:20 PM–3:40 PM	Regulatory Use of DRP Dose Coefficients , Greg Chapman, NRC
3:40 PM–4:10 PM	VARSKIN + SkinDose Used in a Hair Contamination Event , Glen Vickers, Constellation
4:10 PM–4:15 PM	Wrap Up

RASCAL TRAINING (DAY 1 AND DAY 2)



Rigel Flora

NRC



Jeff Kowalczyk

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.

Training for Beginner Users (Day 1)

This RASCAL training course is a hands-on computer class for new RASCAL users. No experience with RASCAL is required, but a general familiarity of radiological assessments will be helpful. Instructors will walk users through a step-by-step example of doing a dose assessment using RASCAL 4.3.3. Discussion topics include:

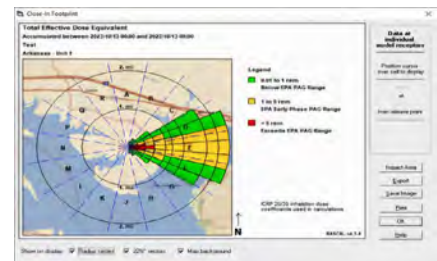
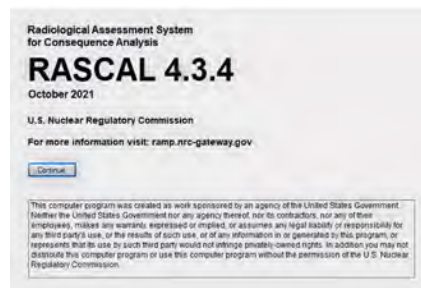
- ▶ RASCAL capabilities & tools
- ▶ Site locations
- ▶ Source Term models
- ▶ Atmospheric models
- ▶ Reading results

Training for Intermediate/Advanced Users (Day 2)

This RASCAL training course is a hands-on computer class for intermediate and experienced RASCAL users. Experience with RASCAL is required. Instructors will walk users through a series of dose assessments, focusing on comparing models in a real-world scenario. Discussion topics include:

- ▶ Building RASCAL runs for severe accident progressions
- ▶ Core damage estimation using containment radiation monitors
- ▶ Comparing small and large break coolant accidents
- ▶ Comparing projection results to field measurements

Users are required to have RASCAL 4.3.4 installed on their computer prior to attending.



CAP-88 OVERVIEW (DAY 1)



Brian Littleton

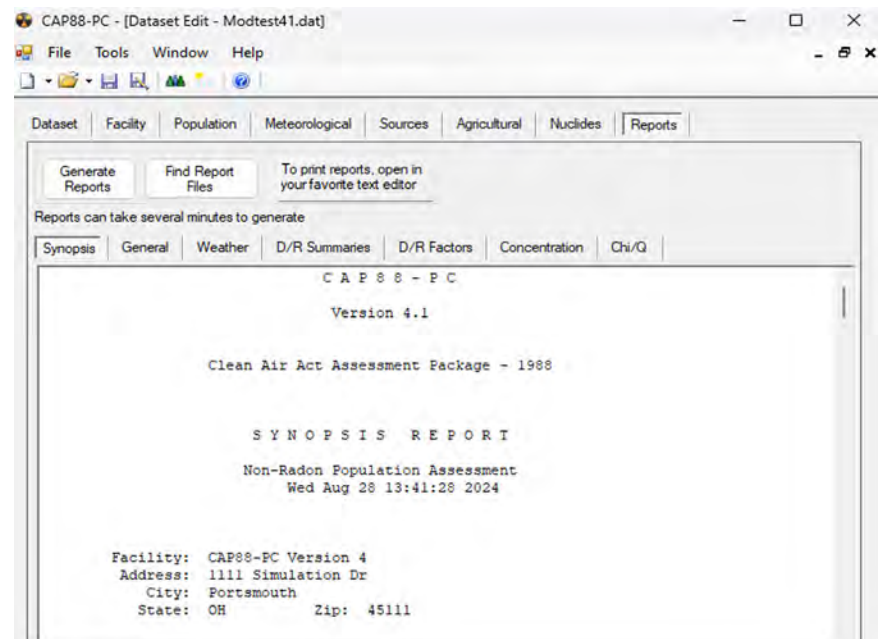
EPA

Clean Air Act **A**ssessment **P**ackage – 1988 (CAP-88) is the U.S. Environmental Protection Agency (EPA) computer code for estimating the dose and risk from emissions of radioactive material to the air. Version 4.1.1 is the most current CAP88-PC and is a regulatory compliance tool under the National Emissions Standard for Hazardous Air Pollutants, Subpart H.

This training module will:

- ▶ Explain how the code is executed
- ▶ Provide the user with basic input parameters that are used in model runs
- ▶ Provide example runs of the code
- ▶ Cover some of the pros and cons with using CAP88-PC.

When the module is complete the user will be able to perform air dispersion dose assessments for releases using CAP88-PC and understand the limitations of the code's usage.



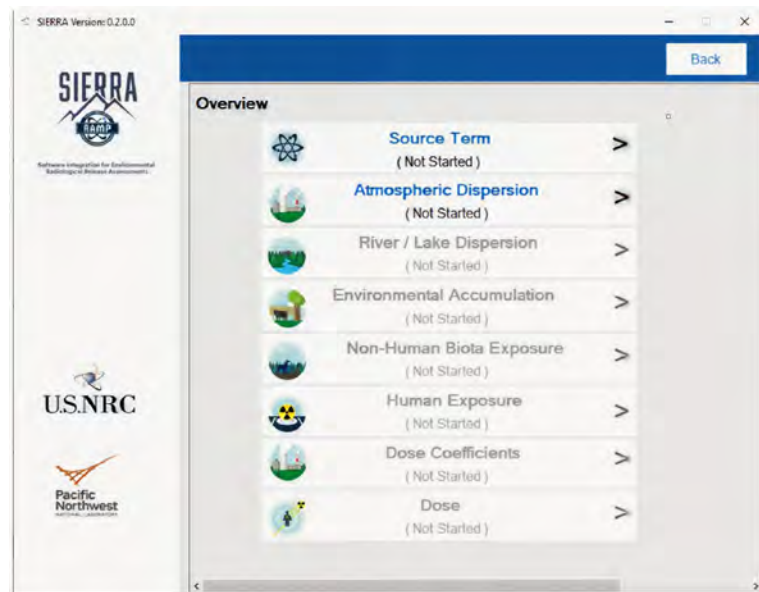
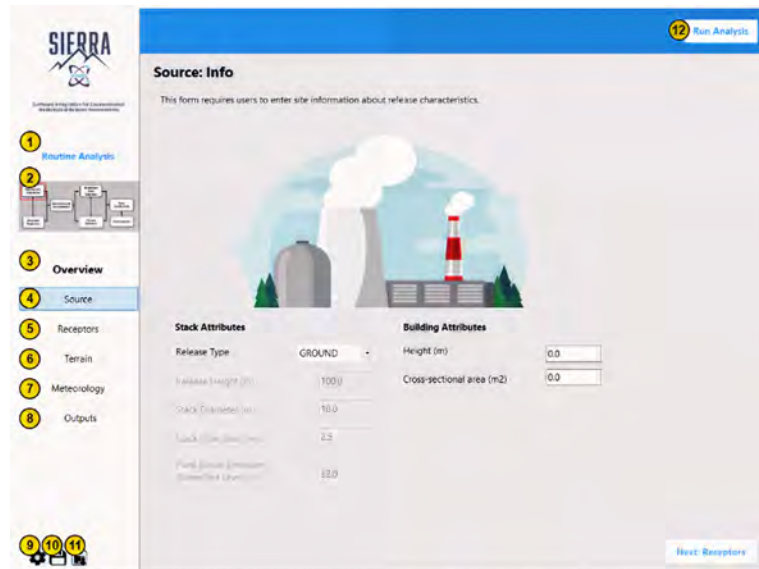
SIERRA ATD OVERVIEW (DAY 2)



Julia Flaherty
PNNL



The SIERRA **A**tmospheric **T**ransport and **D**iffusion (ATD) is responsible for evaluating releases in cases of design-based accidents (from 100s of meters to 10 km), as well as normal effluent releases for sensitive receptors and populations up to 80 km. This module consolidates the scientific functions of ARCON, PAVAN, and XOQDOQ into a single user interface. SIERRA ATD will allow users to estimate relative concentrations based on hourly meteorological data for all three codes, rather than use joint frequency distributions (which reduces data fidelity).



MACCS WORKSHOPS I AND II (DAY 2 AND DAY 4)



Dan Clayton
SNL

MACCS is a fully integrated, engineering-level computer code developed at Sandia National Laboratories (SNL) for the NRC. MACCS simulates the impact of severe accidents at nuclear power plants (NPPs) and other nuclear facilities on the surrounding environment.

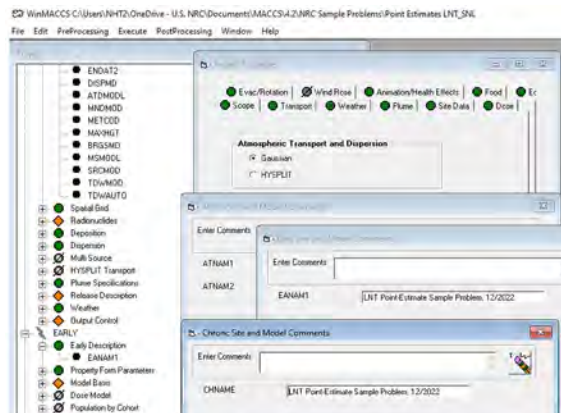
These workshops are broken down by module and specialty use cases. The workshops are taught by MACCS experts, and each module consists of an overview of the science and method, information on applicable use cases, a walk-through of how to use the software, and a supervised exercise to check for understanding. Discussion topics include:

Overview of MACCS and WinMACCS capabilities and general how-to use. This section will include a run through of a simple problem set up from scratch.



Mariah Garcia
SNL

- ▶ **ATMOS Module:** ATMOS performs all of the atmospheric transport calculations for MACCS, including dispersion, deposition, and radioactive decay and ingrowth that occur prior to release and during the time the material is in the atmosphere. These results are used by the EARLY and CHRONC modules.
- ▶ **EARLY Module:** The EARLY module models the period commonly referred to as the emergency phase—this starts with the accident initiation and extends up to 40 days after the arrival of the first plume segment at any downwind spatial interval. In this module, users may specify emergency response scenarios that include evacuation, sheltering, and dose-dependent relocation.
- ▶ **CHRONC Module:** The CHRONC module simulates events that occur following the emergency phase—long-term protective actions taken to limit radiation doses to acceptable levels. The module calculates health effects from both internal and external dose pathways, as well as economic costs due to long-term protective actions.



Users are required to have WinMACCS 4.2.0 installed on their computers prior to attending.

NRCDOSE3 OVERVIEW (DAY 3)



Jon Napier

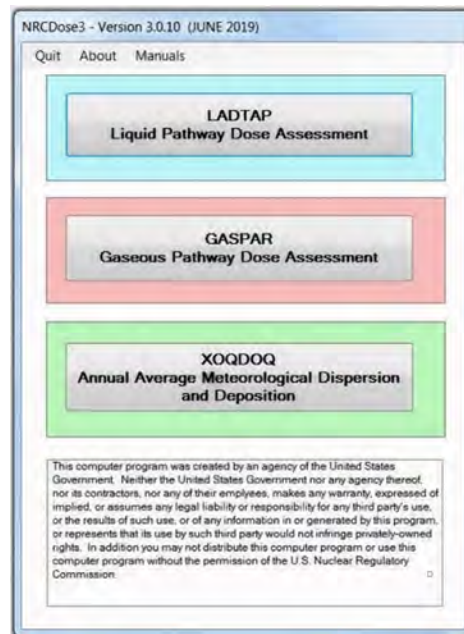
PNNL

NRCDOSE is a user-friendly graphical user interface (GUI) for the LADTAP II, 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.



Colby Mangini

PNNL



Software Integration for Environmental Radiological Release Assessments



DOSIMETRY SYMPOSIUM (VARSKIN+/IMBA/PIMAL) (DAY 4)

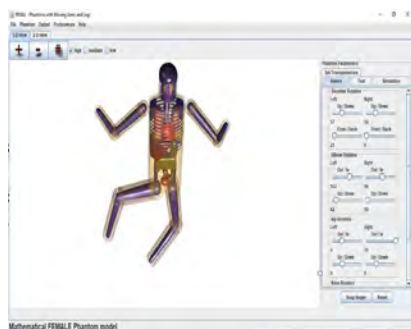
OCTOBER 24, 2024 | FULL DAY
RAMP DOSIMETRY SYMPOSIUM
DURING THE INTERNATIONAL RAMP AND MACCS USER GROUP MEETING
North Bethesda, Maryland (outside of Washington DC) and virtual
Codes of Interest: **VARSKIN, IMBA, PIMAL**

U.S. NRC RAMP MACCS



VARSKIN+ is used to calculate occupational dose to the skin resulting from exposure to radiation emitted from hot particles and/or other contamination on/or near the skin. The IMBA code is a suite of software modules for internal dosimetry that implements respiratory tract, GI-tract, tissue dosimetry, biokinetic and bioassay models as recommended by the International Commission on Radiological Protection (ICRP).

PiMAL is a collection of computational human phantoms useable with MCNP[®] for the assessment of radiation dose to various organs in standard and nonstandard positions through the user inputted articulation of arms and legs.



The symposium will feature the following topics:

- ▶ Introduction of PiMAL 6.0
- ▶ IMBA: Bioassay Tool
- ▶ Upcoming V+ Module on Extravasation Dosimetry
- ▶ V+ SkinDose: Comparison to GEANT4 SKIN DOSE Calculations
- ▶ V+ SkinDose Uses: Hair Contamination Event
- ▶ V+ WoundDose: Needlesticks Concept and its Implications
- ▶ V+ EyeDose: Comparisons to COG Eye Dose Calculators
- ▶ Discrete Radioactive Particles (DRP) Dose Coefficients



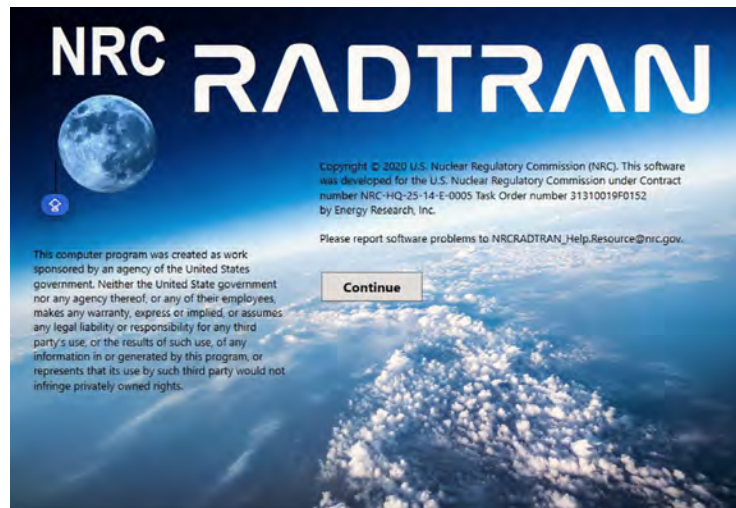
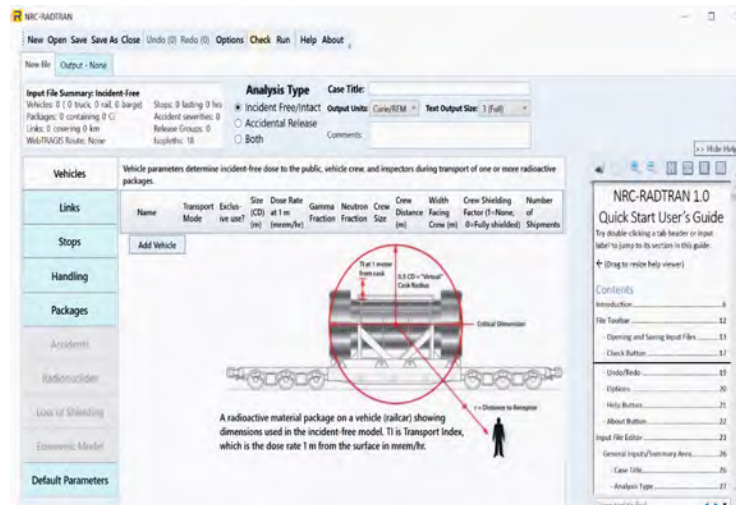
NRC-RADTRAN OVERVIEW (DAY 4)



Jon Napier

PNNL

The NRC Radioactive Material Transport (NRC-RADTRAN) computer code is used for risk and consequence analysis of radioactive material (RAM) transportation. A variety of RAM is transported annually within this country and internationally. The shipments are carried out by overland modes (mainly truck and rail), marine vessels, and aircraft. Transportation workers and persons residing near or sharing transportation links with these shipments may be exposed to radiation from RAM packages during routine transport operations; exposures may also occur as a result of accidents. Risks and consequences associated with such exposures are the focus of the NRC-RADTRAN code.



RAMP AND MACCS MEETING TOURS

Tours of the NRC Operations Center

Date: Monday and Tuesday, October 21–22, 2024

Where: 3WFN North Bethesda, MD

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 when 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 and MACCS User Meeting Opening Session.



National Institute of Standards and Technology (NIST)

Date: Wednesday, October 23, 2024

Where: Gaithersburg, MD

The National Institute of Standards and Technology (NIST) was founded in 1901 and is now part of the U.S. Department of Commerce. NIST is one of the nation's oldest physical science laboratories. Congress established the agency to remove a major challenge to U.S. industrial competitiveness at the time—a second-rate measurement infrastructure that lagged behind the capabilities of the United Kingdom, Germany, and other economic rivals.

From the smart electric power grid and electronic health records to atomic clocks, advanced nanomaterials, and computer chips, innumerable products and services rely in some way on technology, measurement, and standards provided by the National Institute of Standards and Technology.

Today, NIST measurements support the smallest of technologies to the largest and most complex of human-made creations—from nanoscale devices so tiny that tens of thousands can fit on the end of a single human hair up to earthquake-resistant skyscrapers and global communication networks. (Source: www.nist.gov)



NIST TOUR SCHEDULE

1:00 PM

Leave from NRC

1:30 PM–2:00 PM

Arrival and Badging

NIST Visitor Center

2:00 PM–2:10 PM

Travel to Building 245 and NZERTF

2:10 PM–2:50 PM

GROUP 1: Radiation Physics Tours

Building 245

- Manny Mejias
- Denis Bergeron
- Max Carlso
- Michelle O'Brien
- Mike Mitch

GROUP 2: Net-Zero Energy House

NTZERF Entrance

- Brian Dougherty
- Andrew Shore

2:50 PM–3:00 PM

Travel to Building 245 and NZERTF

3:00 PM–3:50 PM

GROUP 1: Net-Zero Energy House

NTZERF Entrance

- Brian Dougherty
- Andrew Shore

GROUP 2: Radiation Physics Tours

Building 245

- Manny Mejias
- Denis Bergeron
- Max Carlson
- Michelle O'Brien
- Mike Mitch

3:50 PM–4:00 PM

Travel to NCNR

4:00 PM–5:00 PM

The NIST Center for Neutron Research (NCNR)

NCNR Room K04, Beamline

- Tom Newton

5:00 PM

Departure

NCNR Entrance

TOUR DESCRIPTION

Health Physics at NIST

Manny Mejias

manny.mejias@nist.gov

Radiation: Medical Interventions and Quantum Technologies

Denis Bergeron

denis.bergeron@nist.gov

Max Carlson

max.carlson@nist.gov

Radiation is used widely in health care to see inside the body to detect tumors, to destroy tumors, or to visualize cells and tissues. NIST develops, maintains, and disseminates national measurement standards that help assure the safety and efficacy of these applications. NIST researchers are also developing quantum-based sensors that can efficiently detect the amount of activity in a sample and, more importantly, distinguish between the different materials that produce the radioactivity (such as, whether it's a banana or a dirty bomb).

Accurately Measuring Radiation Dose

Michelle O'Brien

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Mike Mitch

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How much of a radiation dose are you getting with your x-rays? When it comes to mammograms, for example, the goal is to ensure patients receive enough radiation to be effective but not so much that it causes harm. In this laboratory space, researchers calibrate detectors that measure the amount of radiation dose transmitted. Our customers include military programs, detector manufacturers, government laboratories, and other calibration labs that support medical facilities.

The Net-Zero Energy House

Brian Dougherty

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Andrew Shore

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Built to look and function like a typical suburban Maryland house, the Net-Zero Energy Residential Test Facility (NZERTF) is used to test new and existing energy-efficient technologies as well as to develop test methods that better reflect how those technologies will perform in a real home.

The NIST Center for Neutron Research (NCNR)

Tom Newton

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The NIST Center for Neutron Research (NCNR) is the premier neutron research facility in the U.S. and is among the leading facilities of its kind in the world. At the NCNR, intense beams of neutrons—a subatomic particle—are used to probe the nanoscale properties of novel materials and, indeed, the structure of physics. Research at the NCNR has led to advances in systems of technological relevance such as magnetic storage-media technology and improvements to hydrogen fuel cells, and to our understanding of the universe within which we live.

EVENING EVENTS



RAMP Social Night

MONDAY, OCTOBER 21

5:00–7:00 PM

Summer House Santa Monica

11825 Grand Park Ave
North Bethesda, MD 20852

Network with RAMP administrators, code developers, and other RAMP members. Hors d'oeuvres provided by Renaissance Code Development (RCD). No-host bar.



RAMP No-Host Dinner

WEDNESDAY, OCTOBER 23

6:00–8:00 PM

Lao Sze Chuan

20 Paseo Dr
North Bethesda, MD 20852

THINGS TO DO



North Bethesda, MD

<http://www.americantowns.com/md/northbethesda>



Rockville, MD

<http://www.americantowns.com/md/rockville>



Washington, DC

<http://washington.org>, <http://visitdc.com>

MEAL OPTIONS

METRO PIKE CENTER

(2-5 minutes) Across the Street

Dunkin Donuts

11530 Rockville Pike

Sweet Frog

11520 Rockville Pike

Taipei Tokyo Cafe

11510 Rockville Pike

Stella's Bakery

11510 Rockville Pike

Pizza Boli's

11540 Rockville Pike

PIKE & ROSE

(10 minutes) – North of NRC

&pizza

11626 Old Georgetown Rd

Bibibop

11584 Old Georgetown Rd

Burgerfi

11881 Grand Park Ave

Call Your Mother

11807 Grand Park Ave

Caruso's Grocery

11820 Trade St

Chipotle

11802 Rockville Pike

City Perch

11830 Grand Park Ave

Commonwealth Indian

11610 Old Georgetown R

Fogo de Chao

11600 Old Georgetown Rd

Hello Betty

940 Rose Ave

Jinya Ramen Bar

910 Prose St

Julii

11915 Grand Park Ave

Kung Fu Tea

11802 Rockville Pike

Kusshi

11826 Trade St

Melina

905 Rose Ave

Nada

11886 Grand Park Ave

Nando's

922 Rose Ave

Owens Ordinary

11820 Trade St

Pinstripes

11920 Grand Park Ave

Roaming Rooster

11580 Old Georgetown Rd

South Block

11803 Grand Park Ave

Sports & Social

11800 Grand Park Ave

Summer House

11825 Grand Park Ave

Sweetgreen

11875 Grand Park Ave

Starbucks

11860 Grand Park Ave

Sunday Morning Bakehouse

11869 Grand Park Ave

The Baked Bear

929 Rose Ave

WHITE FLINT STATION

(2-5 minutes) – Across the Street

Pho Eatery

11618 Rockville Pike

Mediterranean House of Kabob

11616 Rockville Pike

Ize's Deli and Bagelry

11622 Rockville Pike

Papa John's

11638 Rockville Pike

Tropical Smoothie Cafe

11620 Rockville Pike

NORTH BETHESDA MARKET

(10-15 minutes) – South of NRC

China Garden Han Gong

11333 Woodglen Dr

Lao Sze Chuan

20 Paseo Dr

Seasons 52

11414 Rockville Pike

Starbucks

17 Paseo Dr

OTHER PLACES

KPot Korean Hot Pot & BBQ

5550 Randolph Rd

Kuya Ja's Lechon Belly

5268-H Nicholson Ln

Far East

5055 Nicholson Ln

McDonald's

11564 Rockville Pike

Popeyes Louisiana Kitchen

11720 Rockville Pike

Sheba Ethiopian

5071 Nicholson Ln

Shouk Vegan

5568 Randolph Rd

Subway

5210 Nicholson Ln

Sushi Toro

5268 Nicholson Ln

The Big Greek Cafe

5268 Nicholson Ln

Vie de France Bakery Cafe

5218 Nicholson Ln

Wendy's

5001 Nicholson Ln

**MARKET/GROCERY/
CONVENIENT STORES**

Harris Teeter

11845 Old Georgetown Rd

Whole Foods

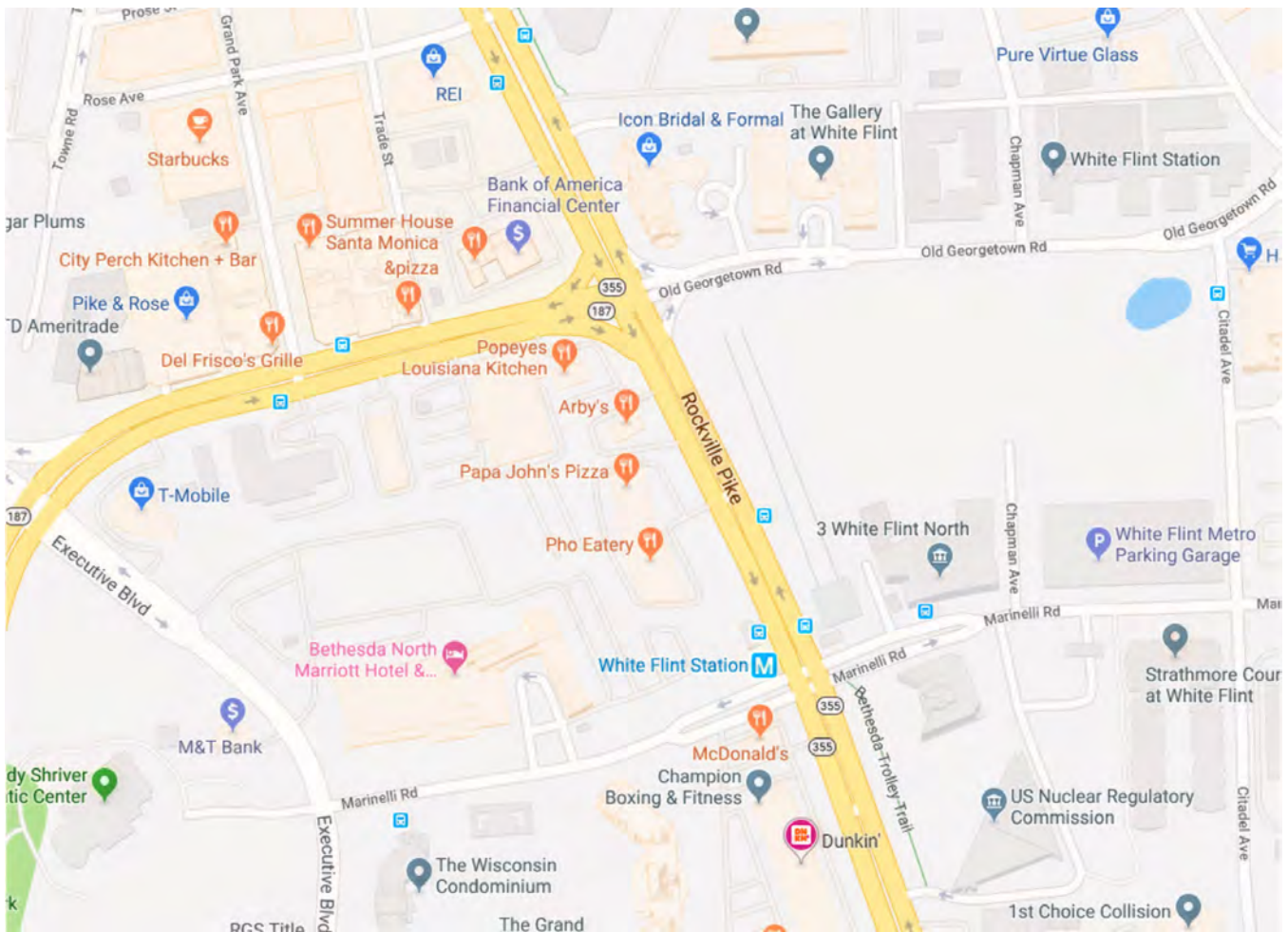
11355 Woodglenn Dr

7-Eleven

11530 Rockville Pike

CVS Pharmacy

11416 Rockville Pike





SEE YOU IN CANADA!

MAY 2025

Spring 2025 RAMP Users Group Meeting hosted by
the Canadian Nuclear Safety Commission (CNSC)

FOR ADDITIONAL INFORMATION:

RAMP@nrc.gov or RAMP.Admin@pnnl.gov

<https://ramp.nrc-gateway.gov>



The 16th Meeting of the European MELCOR and MACCS User Group will be held in Brno, Czech Republic, in April 2025. The exact date will be provided at the end of 2024.