U.S. NRC Radiation Protection Computer Code Analysis and Maintenance Program (RAMP)

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What is RAMP?

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Radiological Protection Computer Code Analysis and Maintenance Program (RAMP)

- New initiative by the NRC to distribute, maintain, develop, and provide training on NRC radiation protection codes.
- Developed and maintained by the NRC Office of Research
- Intended to ensure that codes are continually maintained on current operating systems and updated, if needed.

Goals of RAMP

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1. Ensure codes are appropriately updated
2. Ensure codes reflect computer programming language updates
3. Updates are in accordance with International Regulations and Guidance Documents
4. Codes are updated based on lessons learned from events such as Fukushima
5. Costs are shared among users of the codes
6. Centralized management structure for reporting, prioritizing and resolving code issues

Benefits of RAMP

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1. Access to the most current versions of the code
2. Code maintenance, development, benchmarking, and uncertainty studies
3. A cooperative forum to resolve code errors and inefficiencies
4. Technical basis documents and user guidelines for applying the codes, and periodic meetings to share experiences, discuss code development
5. Periodic training on the codes.

What Programs are in RAMP?

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- RASCAL
- RADTRAD
- HABIT
- VARSKIN
- PiMAL
- Radiological Toolbox
- DandD

https://www.usnrc-ramp.com/

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Radiation Protection Computer Code
Analysis and Maintenance Program

Home | RASCAL | SNAP/RADTRAD | HABIT | VARSKIN | GALE | Radiological Toolbox | PIMAL | DandD

Welcome! Kevin Quinlan
Log out

RASCAL Navigation

- Registration for the RASCAL Code
- Download the RASCAL Code
- Download the RASCAL User Guide
- Download the RASCAL Technical Documents
- RASCAL Support
- RASCAL Training & Presentation Materials
- RASCAL Change Logs

RAMP Navigation

- Contact RAMP Administrators
- RAMP Registration
- RAMP Forum
- FAQs
- RAMP Information Policy Paper (SECY-14-0117)
- RAMP Newsletter
- Related Links
- Contact Us

Related Information

- NRC Organization Chart
- About Research
- Standards Development
- NRC Formal (NUREG)
- Publications
- Regulatory Guides

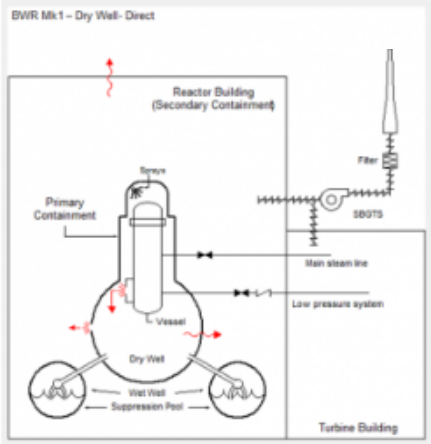
Radiological Assessment System for Consequence AnaLysis (RASCAL) Overview

The RASCAL code is a tool used by the Protective Measures Team in the U.S. Nuclear Regulatory Commission's (NRC's) Operations Center for making independent dose and consequence projections during radiological incidents and emergencies. RASCAL was developed by NRC over 25 years ago to provide a tool for the rapid assessment of an incident or accident at an NRC-licensed facility and aid decision-making such as whether the public should evacuate or shelter in place. RASCAL evaluates atmospheric releases from nuclear power plants, spent fuel storage pools and casks, fuel cycle facilities, and radioactive material handling facilities. Its data is not the only criterion used by the local authorities during an accident, but certainly an important one.

RASCAL has been continually upgraded and improved upon to include updated source term models, atmospheric transport models, nuclear power plant site-specific data and updated computer calculation methods.

- RASCAL version 4.3.1, which was released in December 2014, is an update to RASCAL v4.3 that resolves coding issues identified by user feedback. Specifically, the update resolves RASCAL v4.3 coding issues with the generation of source terms for various nuclear power plant scenarios. Additionally, clarifying information was incorporated into the Spent Fuel Pool STDose module, Source-Term Import, Export and Merge Functions, and Meteorological Data Handling modules to assist the user with these RASCAL 4.3 functions.

RASCAL BWR Mk1 - Dry Well Direct



Programs That May be Added

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- PAVAN
  - Potential to update GUI and dispersion algorithms
- ARCON96
  - Likely update GUI
- XOQDOQ (NRCDose)
  - Likely update GUI

Areas for Improvement RG 1.145 and PAVAN

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- Update 1970's ATD algorithms
  - Turbulence based on stability classes derived from delta-T
  - Dispersion parameters (σ_y and σ_z)
  - Building wake
    - plume entrainment
    - enhanced dispersion
  - Low wind speed conditions
- Use hourly met data instead of JFD tables
- Implement sliding window approach instead of logarithmic interpolation for LPZ χ/Q values greater than 1 hour
- Consider upgrades to the computer code software
  - Implement a windows-based system
  - Resolve "code anomalies" reported by stakeholders
- Conclusion: Code is usable and conservative

Areas for Improvement RG 1.111 and XOQDOQ

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- Update 1970's ATD algorithms
  - Turbulence based on stability classes derived from delta-T
  - Dispersion parameters (σ_z)
  - Building wake
    - plume entrainment
    - enhanced dispersion
- Address adequacy of Gaussian plume model out to 50 miles
  - spatial and temporal changing wind patterns
  - terrain and water influences
- Update dry deposition and depletion algorithms
- Add wet deposition and depletion algorithms
- Use hourly met data instead of JFD tables

Cost of RAMP?

The NRC is not charging for codes. RAMP is a voluntary program that charges for membership. Funds from this membership go directly into the research and development of codes

Who	Services	Cost
US NRC Licensees/Vendors ***** **US Universities and Research Organizations using codes in licensing decisions** ***** **For individual codes see code website tab under the RAMP website**	○ All Codes in RAMP ○ All Documentation ○ All User Forums ○ All Email Help Request ○ All Training, when available, with limited seating per company	20,000.00 USD/year or 20,000.00 USD/year Per Reactor Site
U.S. local/state/government entities ****** **U.S. Universities using codes for Research Purposes**	○ All Codes in RAMP ○ All Documentation ○ All User Forums ○ All Email Help Request	Free

How/When are Codes Updated

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- Codes are updated on an as-needed basis
- NRC Office of Research coordinates with technical staff to determine best path for code updates

RAMP Contacts

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- For questions about RAMP

https://www.usnrc-ramp.com/

RAMP@nrc.gov