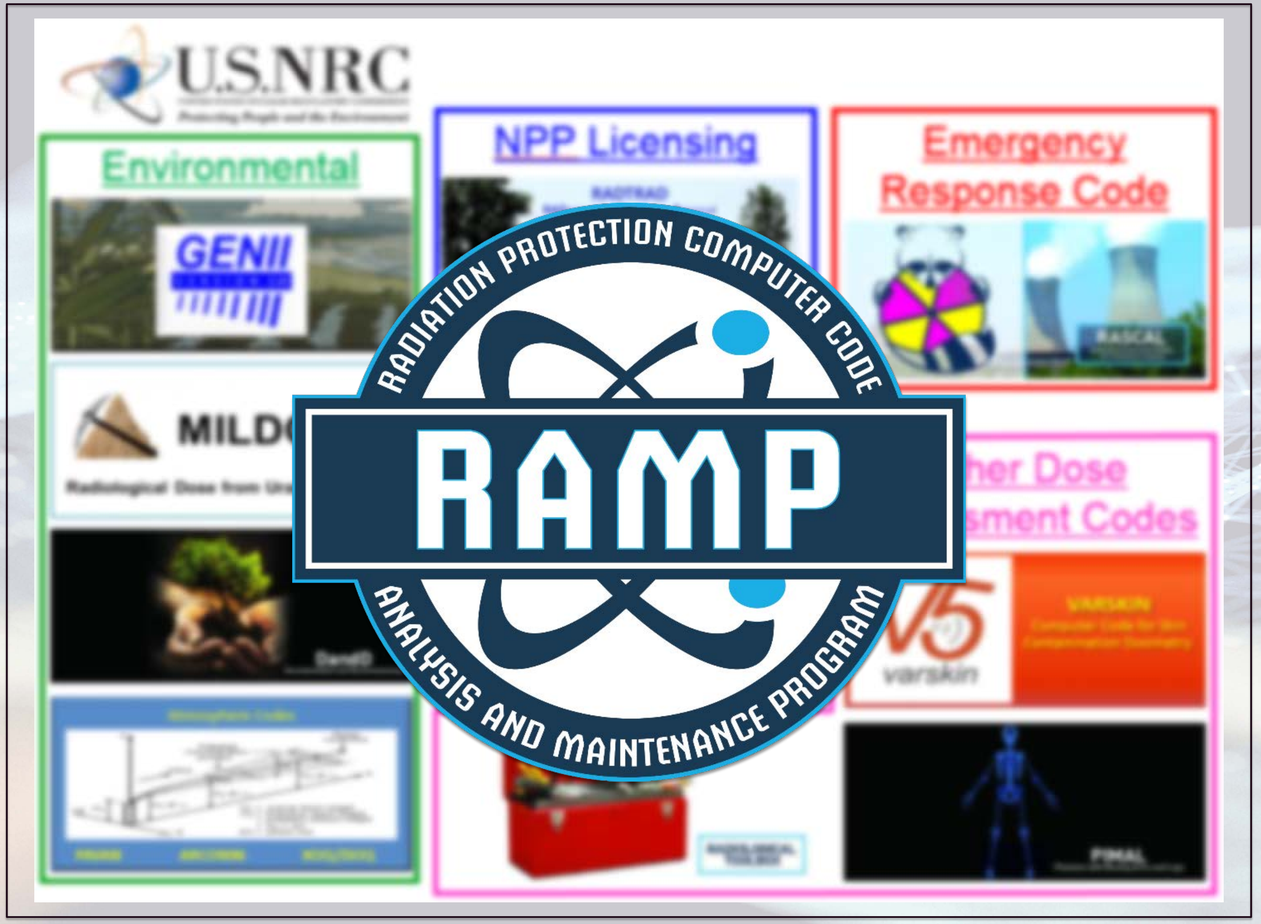
RAMP: The Radiation Protection Computer Code Analysis and Maintenance Program

Office of Nuclear Regulatory Research

What Is RAMP?

The U.S. Nuclear Regulatory Commission (NRC), Radiation Protection Computer Code Analysis and Maintenance Program (RAMP), develops, maintains, improves, distributes, and provides training on NRC-sponsored radiation protection and dose assessment computer codes. These codes cover licensing, emergency response, and dose assessment.

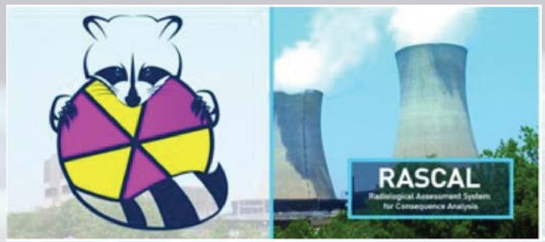
The codes are used by NRC staff, other U.S. Federal agencies, the NRC's Agreement States, licensees, and international partners.



Codes in RAMP

Emergency Response - RASCAL

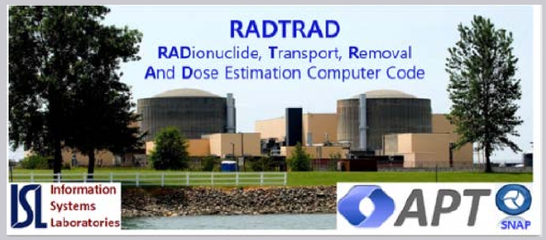
Used for making dose projections for atmospheric releases during radiological emergencies. It is the premier code used by the NRC's emergency operations center.

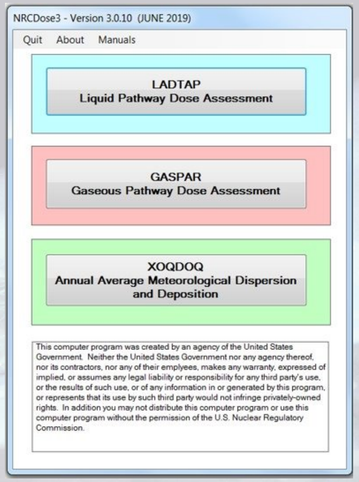


Habit 2.0

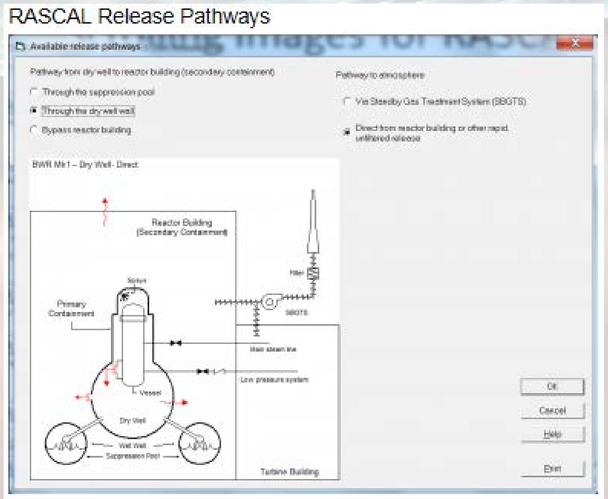
Gaseous And Liquid Effluent

RADTRAD
RADionuclide, Transport, Removal And Dose Estimation Computer Code

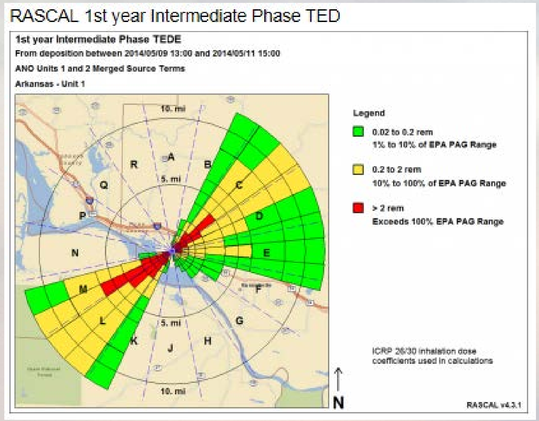




RASCAL Release Pathways



RASCAL 1st year Intermediate Phase TED



Nuclear Power Plant Licensing Assistance

SNAP/RADTRAD: Estimates doses to the public, from design-basis accidents (DBA), at the exclusion area boundary (EAB) and low population zone (LPZ) and occupational doses in the control room.

HABIT: Estimates chemical exposures that personnel in the control room of a nuclear facility would be exposed to in the event of an accidental release of toxic chemicals.

GALE: Estimates quantities of radioactivity released by a plant through liquid and atmospheric discharges during routine operations.

RADTRAN: Risk and consequence analysis of radioactive material (RAM) transportation.

NRCDose: User-friendly graphical user interface (GUI) for the LADTAP II, GASPAR II, and XOQDOQ programs, which are Fortran codes used to implement NRC's current requirements for **A**s **L**ow **A**s (is) **R**easonably **A**chievable (ALARA) for radioactive effluents from nuclear power plants.

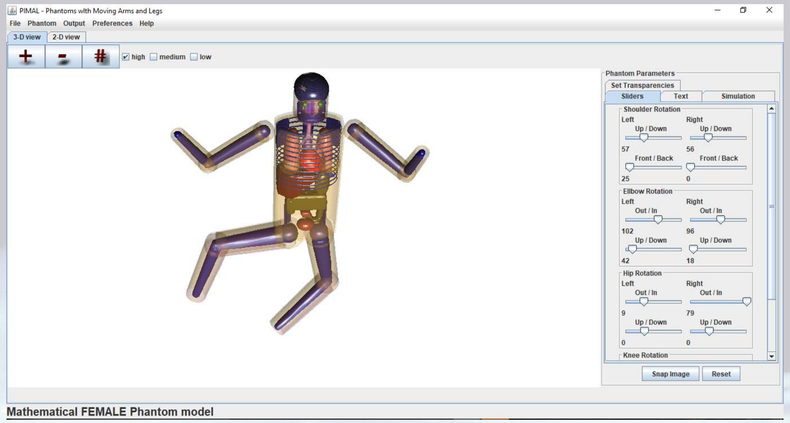
Codes in RAMP

Environmental and Atmospheric Assessments

GENII: Estimates radionuclide concentrations in the environment and dose to humans from acute or chronic exposures from radiological releases or initial contamination conditions.

MILDOS: Calculates radiological dose commitments received by individuals and the general population within an 80-kilometer radius of an operating uranium recovery facility.

PAVAN, ARCON96: Models the atmospheric influence on routine radiological releases and design-basis accidents.



Mathematical FEMALE Phantom model

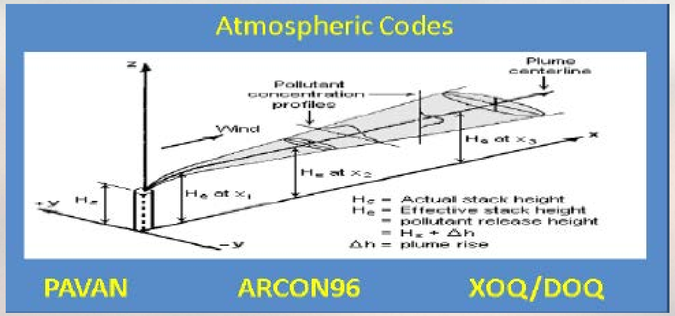
VARSKIN

Other Dose Assessments

Radiological Toolbox: Database that includes dose coefficients for exposure to radionuclides distributed in the environment and for exposures to photon and neutron radiation fields.

VARSKIN: Performs confirmatory calculations of licensees' submittals on skin dose estimates at any skin depth or volume with point, disk, cylindrical, spherical, or slab surfaces. Also enables users to compute doses from multiple sources.

PIMAL: Graphical user interface of a phantom with moving arms and legs.



Users' Group Meetings and More

RAMP hosts two meetings a year during the fall and spring, alternating between domestic and international locations.

Meetings consist of code training as well as trainer and user discussions. RAMP is now shifting to hosting more topic-based technical sessions and seminars. To date, several VARSKIN technical meetings and a symposium on dose to the lens of the eye have taken place.

Access to codes, updates, training materials, and technical documentation are only available to RAMP members.

Head to the Web site at https://ramp.nrc-gateway.gov/ for more information!