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Welkom



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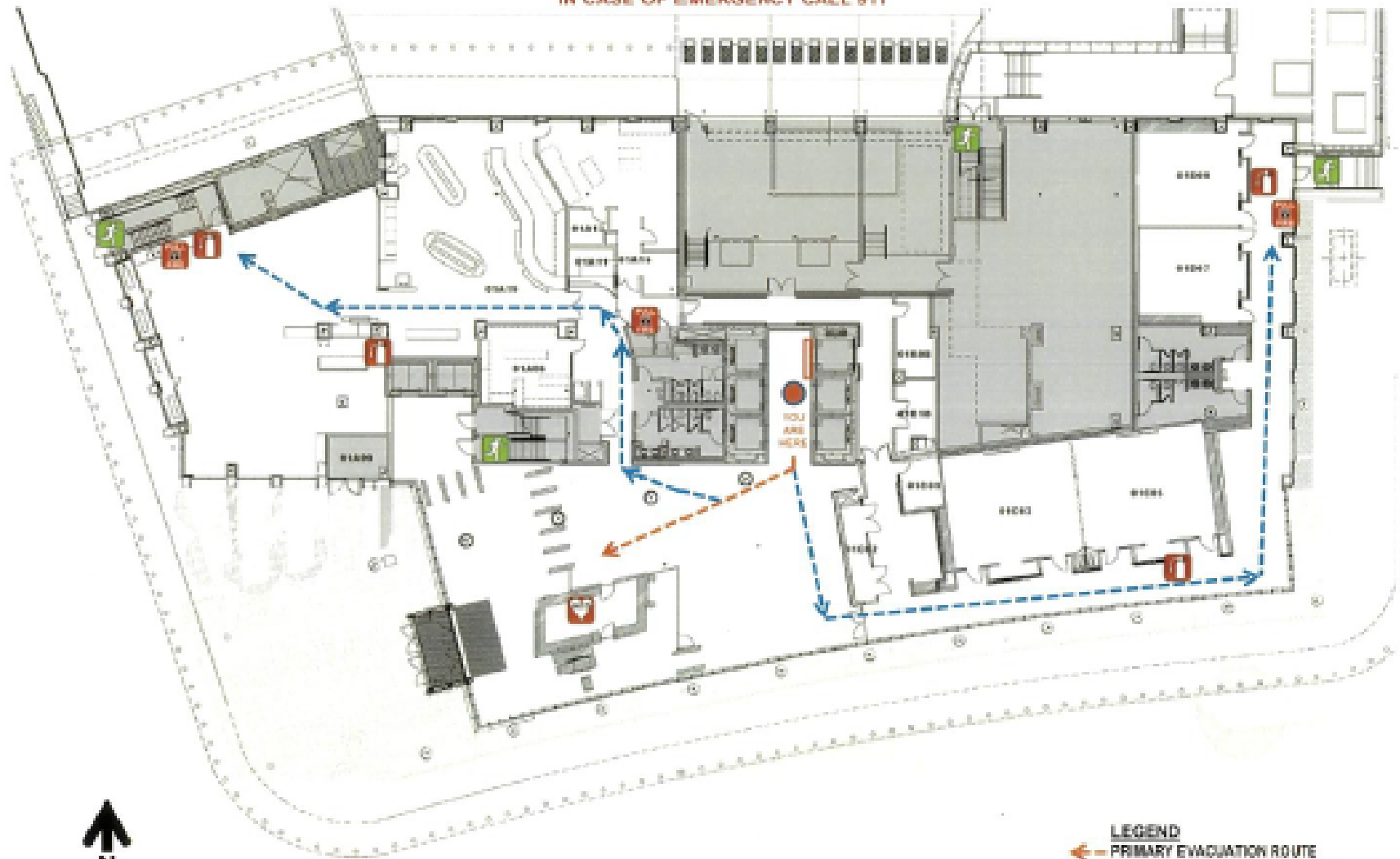
어서 오십시오

欢迎

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# Welcome to the RAMP 2019 Fall User Meeting

IN CASE OF FIRE USE STAIRWAY  
IN CASE OF EMERGENCY CALL 911



# FLOOR 1 THREE WHITE FLINT NORTH

11601 LANDSDOWN STREET NORTH BETHESDA, MD 20852

## LEGEND

- PRIMARY EVACUATION ROUTE
- SECONDARY EVACUATION ROUTE
- EGRESS STAIR
- FIRE ALARM PULL
- FIRE EXTINGUISHER CABINET
- AUTOMATED EXTERNAL DEFIBRILLATOR
- HOSE VALVE CABINET
- EVACUATION PLAN

# Welcome to the 2019 Fall RAMP Users Meeting

NRC's Cooperative Research with Domestic and International Partners



**Kimberly Webber, Ph. D. Deputy Director  
Office of Nuclear Regulatory Research**

*Rockville, MD*

*October 28 — November 01 , 2019*

# Welcome RAMP Partners

- Over 1300 registered RAMP Users
- Over 100 participants at this RAMP Meeting
  - Representatives from 11 Countries
    - Spain, South Africa, United Arab Emirates, Canada, South Korea, Taiwan, Australia, USA, Ghana, Ukraine, Israel
  - Federal Agencies:
    - EPA, NIST, FBI, FEMA, NIH, NRC, DOE, Army, Navy
  - Agreement States: Illinois, Connecticut
  - National Labs: PNNL, ANL, ORNL, INL, Sandia
  - Universities, Medical Facilities, Nuclear Power Plants
  - Non-LWR (Terra Power, Oklo, Kairos, X-energy)



# NRC's Nuclear Regulatory Research

- Mandated by Congress
- Three technical divisions:
  - Division of Engineering
  - Division of Risk Analysis
  - **Division of Systems Analysis**
- About 120 (down from 200 in 4 years) engineers, scientists, analysts, and support staff.
  - ~ 30% M.S. and 30% Ph.D.
- About \$40 M (down from \$65M in 2014) funding.



# Research Mission

- Develop technical bases to support regulatory decisions
- Conduct confirmatory and anticipatory research
- Provide specialized technical expertise and tools
- Partner with national labs, commercial contractors, universities, other government agencies, industry organizations, and international organizations
- Issue Commission and congressionally mandated reports
- Manage the Generic Issues Program

# Research Role

- Licensees and applicants have the primary responsibility for nuclear safety and security
- NRC determines if a safety or security issue exists
- NRC conducts confirmatory and anticipatory research to confirm safety and security
- NRC develops tools, codes, and information to confirm safety and security

# Key Research Areas

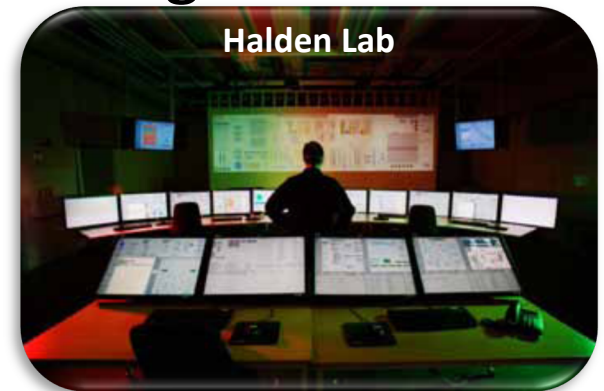
- Thermal-Hydraulics Research
- Fuel and Core Research
- Risk Analysis Research
- Materials Performance Research
- Fire Safety Research
- External Events Research
- Robust International Program
- Structural Performance Research
- Digital Instrumentation & Control and Electrical Research
- Severe Accident and Accident Consequences Research
- **Radiation and Environmental Protection Research**
- Human Reliability and Human Factors Research





# International Research Collaboration

- Strong international cooperation
- 100+ bilateral or multilateral agreements with over 20 countries (12 Agreements for RAMP)
  - Cooperative Research Programs
- Shared insights and resources
- Wide range of technical activities, including
  - Fukushima Activities
  - Halden Reactor Project
  - Advanced Reactor Code Development
  - Fire Research



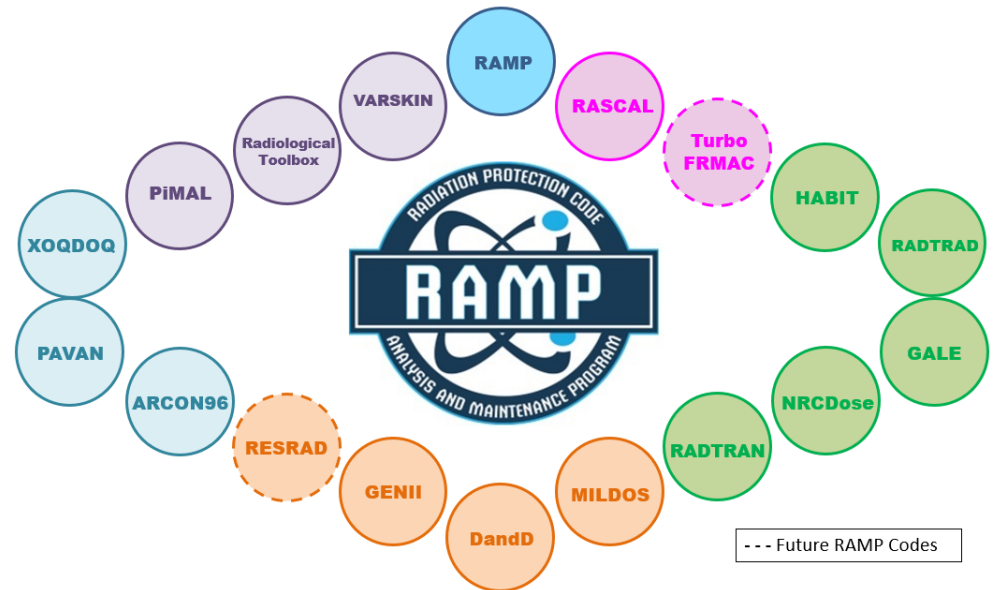
# Cooperative Research Programs

- **RAMP:** Radiation Protection Code Analysis and Maintenance Program to exchange information on radiation protection and dose assessment codes.
- **CSARP:** Cooperative Severe Accident Research Program to exchange information on severe accident safety issues related to reactor, spent fuel pool, and plant systems.
- **CAMP:** Code Applications and Maintenance Program to exchange information on thermal-hydraulic safety issues related to reactor and plant systems.
- **SGTIP:** Steam Generator Tube Integrity Program provides data and analysis for predicting the ability of degraded steam generator tubes to withstand normal operating and accident conditions.

# RAMP

## What is RAMP?

RAMP is a Computer Code Management Program for development, maintenance and distribution of radiation and dose assessment codes.



These codes calculate dose for environmental assessment, nuclear power plant licensing, emergency response, atmospheric assessment and other dose assessment scenarios.

# Current RAMP International Agreements



[Armenia](#)



[Taiwan](#)



[South Africa](#)



[Australia](#)



[Ukraine](#)



[South Korea](#)



[Canada](#)



[United Arab Emirates](#)



[Spain](#)



[Ghana](#)



[Vietnam](#)

# Your Role in the Meeting

- Thank you for coming!
- Participate actively
- Share your insights
- Work together for safety
- Build networks
- Strengthen collaboration
- Enjoy Washington D.C.

# RAMP: Present and Future



**John Tomon, CHP**  
**Chief, Radiation Protection Branch**

*Rockville, MD*

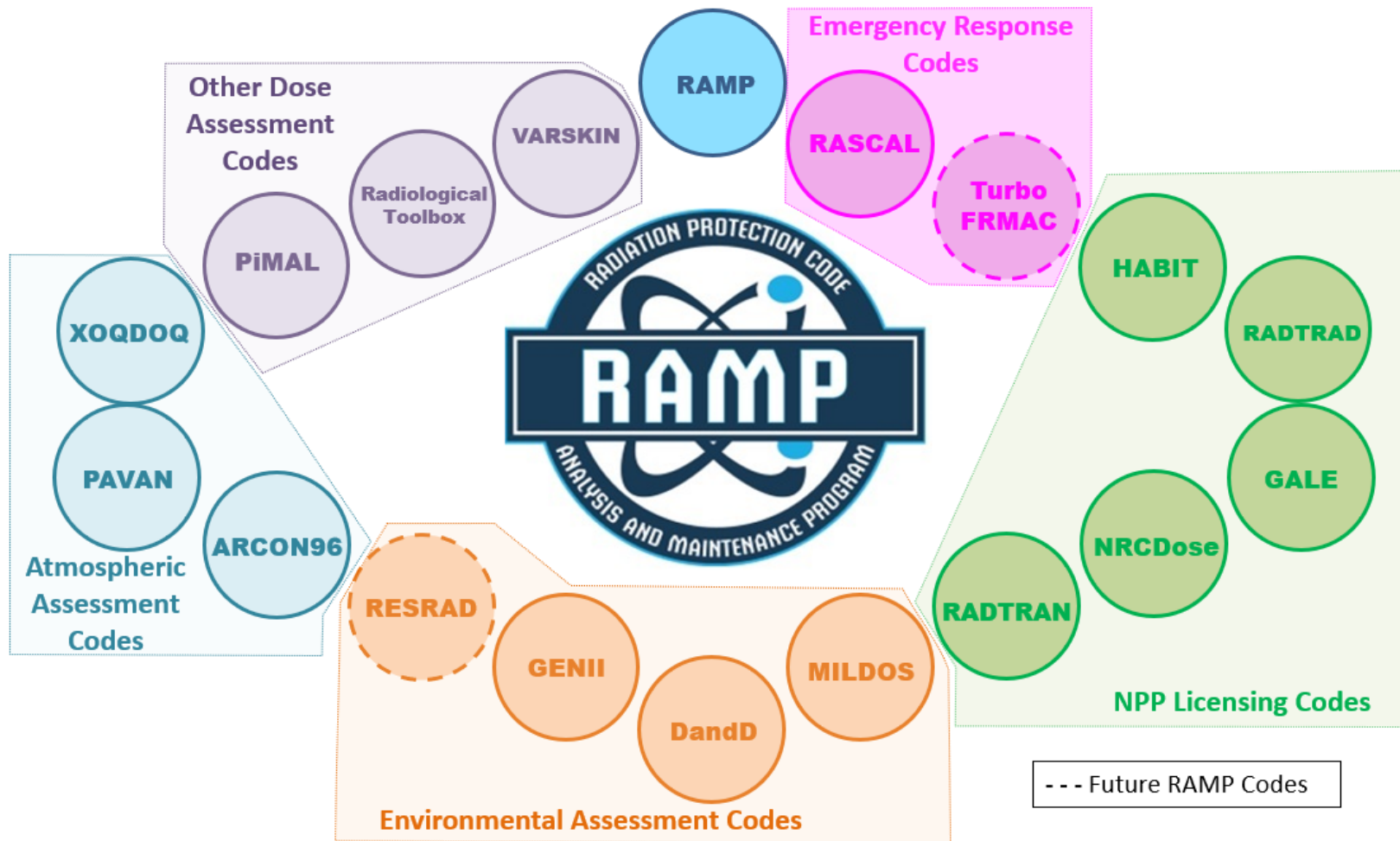
*October 28 — November 01 , 2019*

# What is RAMP?/Need for RAMP

## Computer Code Management Program:

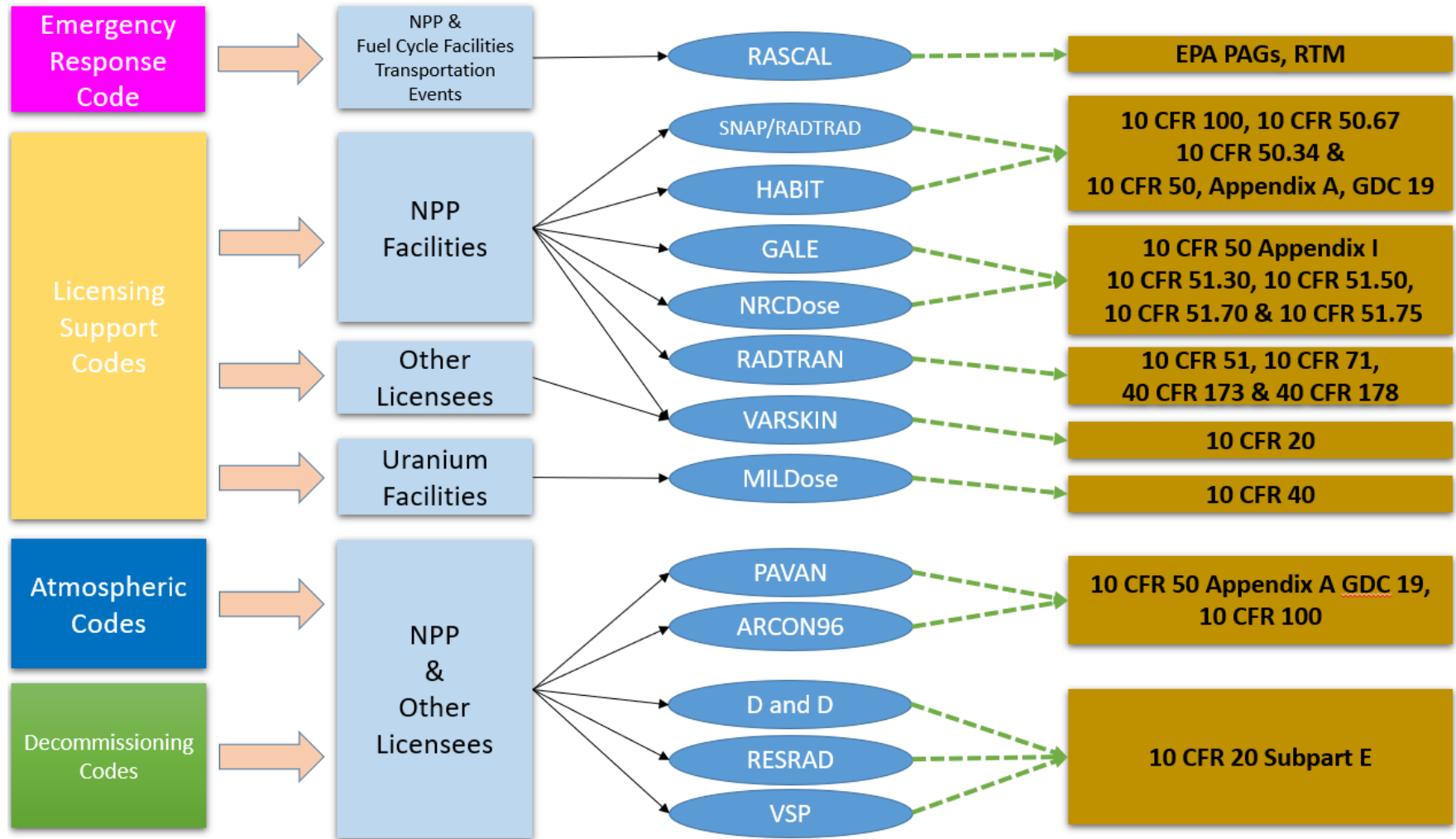
- Streamline updates/ recognized code issues
- Incorporating the latest accepted state of the art models
- Prioritize technical updates
- Achieve consistency in documentation
- Fiscally responsible by leveraging group dynamics
- Implement centralized and consistent management and control structure
- Leverage the NRC expertise in member country activities
- Customer relationship management
- Obtain user-endorsed roadmap for codes

# Dose Assessment Codes in RAMP





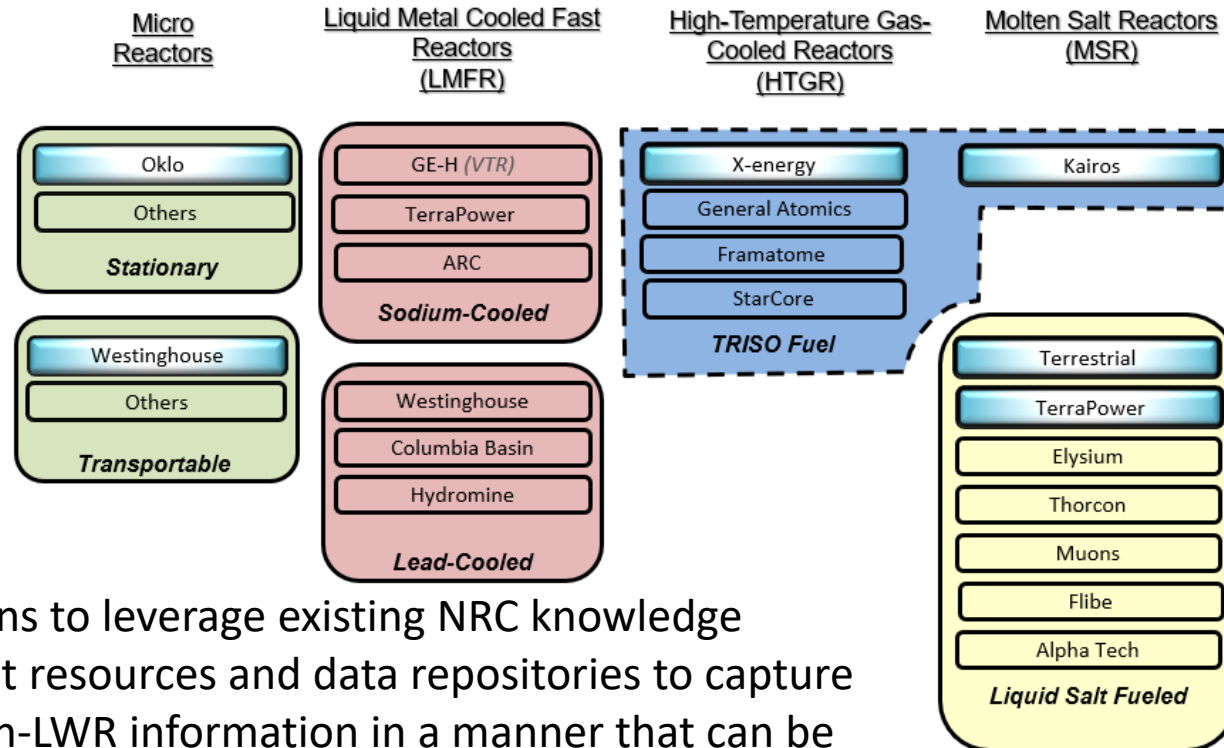
# RAMP Code Regulatory Applications



# Future Activities in RAMP

- Include Additional Codes:
  - In talks with DOE for RESRAD, Turbo FRMAC
- Updated Software Quality Assurance Program
- Combine Codes for Greater Efficiencies
- Maintain Code Development
  - Ensure Compatible platform
  - Consistent Documentation
- Develop online training and information modules
  - More RASCAL Modules, VARSKIN, RADTRAD, & NRCDose
  - Health Physics and Radiation Safety Training
- Meeting regulatory requirements
  - Security and Safeguards

# Radiation Protection Needs for Advanced Reactors



The NRC plans to leverage existing NRC knowledge management resources and data repositories to capture available non-LWR information in a manner that can be easily accessed and maintained.

The NRC is evaluating which RAMP codes are going to need development and areas where we can collaborate with existing knowledge and RAMP members.

# Code Consolidation & Leveraging

- RAMP collaborates with both international and domestic partners: including universities, companies, federal agencies, States, licensees, medical institutions, etc.
- RAMP has a strong international research collaboration program with 11 International Agreement Countries
- Larger user group: troubleshooting, forums, training
- Opportunity to gain expertise and request help from the code developers
- Fiscally responsible by leveraging group dynamics
- Leverage the US NRC expertise in member country activities; share international codes
- Consolidation efforts to gain in efficiencies with federal partners (i.e., EPA's CAP88, COMPLY; England's IMBA, DOE's RESRAD and Turbo FRMAC)



# RAMP International Agreements & Activities

Member contributions have saved NRC and Country resources and improved the codes. The larger user community and range of applications help to identify code problems and improved modeling approaches. Examples include:

- Identifying code errors
- Plant modeling for new applications
- Improvement to code models

# International Collaboration

## What benefits have already been garnered from international RAMP collaboration?

- For South Africa
  - RASCAL: Added facilities and Met towers to database
  - ARCON96: Helping with confirmatory analysis
- For Canada
  - RASCAL: Specialized CANDU import Source Term
  - MILDOS: Specialized training code updates for Canadian needs
- For Taiwan
  - RASCAL: Added facilities and Met towers to database
  - GENII: Decommissioning Examples
  - HABIT/RADTRAD: NUREG/IA-0506 (In-Kind contribution)
- VARSKIN: Available in Spanish and French

# RAMP Users' Meetings

- 2015: 1<sup>st</sup> RAMP User Meeting – NRC Headquarters
- 2016 RAMP Users Meetings
  - Pretoria, South Africa, May 16-20, 2016
  - NRC Headquarters, October 17-21, 2016
- 2017 RAMP Users Meeting
  - Taipei, Taiwan, April 24-28, 2017
  - NRC Headquarters, October 16-20, 2017
- 2018 RAMP Users Meeting
  - Abu Dhabi, United Arab Emirates, March 25-29, 2018
  - Ottawa, Canada, October 29 - November 2, 2018
- 2019 RAMP Users Meeting
  - NRC Headquarters, October 28 – November 1, 2019
  - AND.....

# RAMP 2020 International Meeting

See you in Madrid, Spain – April 2020





# For the meeting.... I Challenge You....

- To learn
- To participate
- To question
- To think outside of the box
- To bring forward suggestions for improvements
- To have fun
- To make new friends 😊

# Again Welcome!

We are glad you are here!