



RADIATION PROTECTION COMPUTER CODE  
ANALYSIS AND MAINTENANCE PROGRAM

# 2017 TAIWAN USERS MEETING

HOWARD CIVIL SERVICE INTERNATIONAL HOUSE

APRIL 24 - 28, 2017





## Welcome to the 2017 Taiwan RAMP Users Meeting



RAMP meeting participants,

Welcome to the 2017 Radiation Protection Computer Code Analysis and Maintenance Program (RAMP) users' meeting in Taiwan. This meeting is hosted by the Atomic Energy Council (AEC) and the Institute of Nuclear Energy Research (INER). It is also sponsored by the U.S. Nuclear Regulatory Commission's (NRC) Office of Nuclear Regulatory Research (RES).

The AEC is a nuclear regulatory body which was established in 1955. The main missions of AEC include reactor safety regulation, radiation protection, radioactive waste administration, environmental monitoring and R&D for technology development and other civilian nuclear applications. To this end, the AEC strictly enforcing nuclear and radiation safety regulations which meet international standards, and actively promotes scientific and technological researches and innovations in related fields. Under the auspices of the January 2016 Implementing Agreement on RAMP between AIT and TECRO, the AEC and NRC collaborate on technical advancements of the RAMP computer codes.

INER, as a nuclear energy research laboratory in Taiwan, was founded on 1968 and has been working as the technical supporting arm of the administration of AEC. The missions of INER are (1) to develop domestic nuclear technologies to support nuclear safety regulation in Taiwan, (2) to develop radioactive waste management and nuclear facilities decommission technologies, (3) to develop radiopharmaceutical and radiation applications technologies, and (4) to develop technologies on new and renewable energy.

The AEC, together with the INER, welcome participants from all around the world to join in one of the most important annual event for people working on nuclear safety and radiation protection. We deeply believe that everyone involved will benefit from the collaborative exchange of information and idea sharing about radiation protection codes. Hopefully, through precious face to face discussions, all the participants could obtain productive and fruitful results.

We are looking forward to your participation and wish you have a nice experience.



Lih-Yih Liao, Director  
Nuclear Regulatory Technology Support Center  
INER

## Welcome to the 2017 Taiwan RAMP Users Meeting

Meeting participants,

The RAMP Team is pleased to welcome you to the Radiation Protection Computer Code Analysis and Maintenance Program (RAMP) users' meeting in Taipei, Taiwan. This meeting is sponsored by NRC's Office of Nuclear Regulatory Research. We appreciate the gracious hospitality of our colleagues in Taiwan in helping to conduct this important meeting in support of radiation protection.

NRC's Office of Nuclear Regulatory Research (RES) plans, recommends, manages, and implements programs of nuclear regulatory research, confirmatory analyses, standards development, and resolution of generic safety issues for nuclear power plants and other facilities regulated by the NRC. RES supports regulatory decision making and partners with other NRC offices, Federal agencies, industry research organizations, international organizations, and universities.

The RES staff reflects diversity in academic degrees, demographics, and technical disciplines. Our staff includes a wide range of engineering and scientific experts in thermal-hydraulics, severe accident progression, nuclear materials, human factors and human reliability, radiation protection, fire protection, seismology, environmental transport, and probabilistic risk assessment. We leverage this diversity to accomplish NRC's safety and security mission.

RES also conducts 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).

RAMP is RES' newest initiative patterned after the successful CAMP and CSARP programs. The NRC is pleased to sponsor this international RAMP meeting in Taiwan. We thank you for joining us for this meeting to contribute to and benefit from the collaborative exchange of information and ideas on radiation protection. Again, welcome to the RAMP Users' Meeting. We look forward to your active participation.

The RAMP Team



RAMP meeting participants,

I am pleased to welcome you to the Radiation Protection Computer Code Analysis and Maintenance Program (RAMP) meeting in Taipei, Taiwan. 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 updates
- incorporate the latest accepted state-of-the-art models
- prioritize technical updates
- achieve consistency in documentation
- implement a consistent software quality assurance program
- leverage fiscal resources
- implement centralized and consistent management and control structure
- respond to RAMP user needs
- leverage technical expertise

In addition to the RAMP program, my branch is responsible for a number of 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 U.S. Nuclear Regulatory Commission'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.

Welcome again,

Rebecca Tadesse

## MEET THE RAMP TEAM

### NRC RAMP Team



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



John Tomon,  
CHP  
RAMP Program  
Manager



Jeff Kowalczyk,  
CHP  
RAMP Team  
Member



Minh-Thuy Nguyen  
RAMP Team  
Member



Vered Shaffer,  
Ph.D.  
RAMP Team  
Member

### Pacific Northwest National Laboratory (PNNL) RAMP Team



Michael Smith, CHP  
PNNL RAMP Program  
Manager



Tonya Keller  
PNNL RAMP Project  
Coordinator



Lubov Lavrentiev  
PNNL RAMP Project  
Coordinator

### Leidos RAMP Team



Wendy Chinchilla  
Operations, Systems  
Analyst



Raymond Aurdos  
Website Developer



Sabrina Rivers-Carigo  
Website Quality  
Assurance

## Schedule at a Glance

DESCRIPTION OF TRAINING AND EVENTS 8 AM- 5 PM			
Mon., April 24, 2017	Morning Session	Opening Remarks and Plenary Session	
	Afternoon Session	SNAP/ RADTRAD	GENII  HABIT (Discussions)
Tues., April 25, 2017	Morning Session	SNAP/ RADTRAD	
	Afternoon Session	GENII	
Wed., April 26, 2017	Morning Session	SNAP/ RADTRAD	
	Afternoon Session	GENII	
Thur., April 27, 2017	Morning Session	RASCAL	
	Afternoon Session	VARSKIN  ATM Discussions	
Fri., April 28, 2017	Morning Session (day ends at noon)	RASCAL	
		VARSKIN	
		RAMP Closing Remarks and Ceremony	

# WELCOME & OPENING AGENDA

## Fall 2017 RAMP Taiwan Users Group Meeting - Opening Session

Monday, April 24, 2017

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8:00a – 9:00a	Open Registration	
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9:00a – 9:15a	Welcome & Introduction	Shin Chang, Ph.D., Director Nuclear Regulation Department Taiwan Atomic Energy Council
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9:15a – 9:30a	U.S. NRC Address & RAMP Overview	Rebecca Tadesse, Chief U.S. NRC Radiation Protection Branch
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9:30a – 9:45a	RAMP Users Meeting Information & Roll Call	Stephanie Bush-Goddard, Ph.D. U.S. NRC Program Manager - RAMP
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9:45a – 10:00a	Break	
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10:00a – 10:15a	Code Information & Descriptions	Stephanie Bush-Goddard, Ph.D. U.S. NRC Program Manager - RAMP
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10:15a – 10:35a	RASCAL	John Tomon, CHP, U.S. NRC
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10:35a-10:50a	SNAP/RADTRAD	John Tomon, CHP, U.S. NRC
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10:50a – 11:05a	GENII	Bruce Napier, ABD Pacific Northwest National Laboratory
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11:05a – 11:20a	ATMOSPHERIC CODES	Bruce Napier, ABD Pacific Northwest National Laboratory
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11:20a – 11:35a	VARSKIN	Colby Mangini, Ph.D. St. Jude Hospital
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11:35a – 11:45a	QUESTIONS & ANSWERS	All RAMP Team Members
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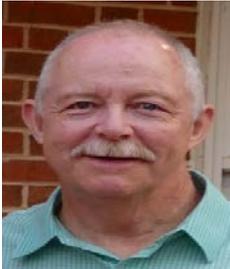
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# Training Sessions Descriptions

## RASCAL

### Instructors:



George Athey  
Athey Consulting



Jeff Kowalczyk, CHP  
U.S. NRC



John Tomon, CHP  
U.S. NRC

RASCAL is 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 computer with RASCAL 4.3.2 installed.
- 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.

## SNAP/RADTRAD

### Instructors:



William Arcieri  
Information Systems  
Laboratories, Inc.



John Tomon, CHP  
U.S. NRC

This training course is a hands-on computer class for Symbolic Nuclear Analysis Package/RADionuclide Transport, Removal, and Dose Estimation (SNAP/RADTRAD) users. The course covers the use of the SNAP Model Editor with the RADTRAD plugin for use with the RADionuclide Transport, Removal, and Dose Estimation analytical code (RADTRAD-AC). SNAP/RADTRAD, was developed for the NRC Office of Nuclear Reactor Regulation, 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).

### Course Requirements:

- Attendees must provide their own computer with SNAP/RADTRAD installed (SNAP v2.5.3 with the RADTRAD plugin v4.11.5, RADTRAD-AC v4.5.5 & AptPlot v6.7.2).

## VARSKIN

### Instructor:



Colby Mangini Ph.D.  
St. Jude's Children's  
Hospital (Memphis, TN)

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.

## GENII

### Instructor:



Bruce Napier  
Pacific Northwest  
National Laboratory

The GENII environmental dosimetry package is a set of codes used for estimating the transport of radioactive releases to air, soil, and surface water and the resulting individual and population radiation doses and risks. GENII provides a state-of-the-art, technically peer-reviewed, documented set of programs for calculating radiation dose and risk following postulated chronic and acute releases.

## Atmospheric Dispersion Discussions

### Instructor:



Bruce Napier  
Pacific Northwest  
National Laboratory

The U.S. Nuclear Regulatory Commission uses several atmospheric transport and diffusion codes to model radiological dispersion in its licensing of existing and new reactors. Three of these codes are currently planned to be entered into RAMP. The codes include:

- XOQDOQ, an atmospheric dispersion code used for routine operational releases.
- PAVAN, an atmospheric dispersion code used in design-basis accident releases to the exclusion area boundary and outer boundary of the low population zone.
- ARCON96, an atmospheric dispersion code used for design-basis accident releases to the control room and technical support center.

The discussion will center on how the U.S. NRC uses these codes and future plans for the codes. The discussion will also feature a question and answer session, and attendees are encouraged to participate in the code development discussion.

## Half-day Tour

### **Nuclear Safety Duty Center & National Palace Museum**

**Date:** Wednesday, April 26, 2017

**Time:** 2:00pm – 5:30pm

#### **Itinerary:**

2:00pm      Gathering at the hotel lobby  
2:20pm      Arrive at Nuclear Safety Duty Center  
3:00pm      Depart for National Palace Museum  
3:40pm      Arrive at National Palace Museum  
5:30pm      Gathering and back to the hotel

## Nuclear Safety Duty Center

**Location:** No.80, Sec. 1, Chenggong Rd., Yonghe Dist., New Taipei City 23452, Taiwan

The Atomic Energy Council (AEC) is the governing agency in charge of the nuclear licensing and related regulatory functions in Taiwan. It has the responsibility to proactively control operational data and monitor radiation status at various domestic nuclear facilities at any time. Also, it maintains close contact with domestic and foreign nuclear organizations to perform the communication test or event report.

During the normal situation, the Nuclear Safety Duty Center is the focal contact point to communicate with the plant licensee or the general public about nuclear safety, radiation release, nuclear waste and other nuclear events. While in the occurrence of nuclear accidents or any significant radiation release events, the center's role will be converted into the communication and emergency response center of the AEC to activate and carry out the emergency response mechanism.



## National Palace Museum

**Location:** No.221, Sec. 2, Zhishan Rd., Shilin Dist., Taipei City 11143, Taiwan

The National Palace Museum (NPM) houses a collection of ancient Chinese artifacts, some of which came from The Palace Museum and the preparatory department of the Nanjing Museum (previously the "National Central Museum"); those that came from The Palace Museum originated from the Qing Court, and those that came from the preparatory department of the Nanjing Museum primarily originated from the Institute for Exhibiting Antiquities, which was previously owned by the Jehol and Shenyang temporary palaces. This signifies that the NPM's current artifact collection contains Qing court artifacts from The Palace Museum, the Jehol temporary palace, and the Shenyang temporary palace.



(Source: Expedia.com.tw)

## Nearby Dining

### American

Restaurant	Address	Phone	Est Walking Time
➤ Grandma Nitti's Kitchen	No.8, Ln. 93, Shida Rd.	02-2369-9751	07 Min
➤ 洋旗牛排餐廳YangCi steak	2F., No.245, Sec. 3, Roosevelt Rd.	02-2367-2559	09 Min
➤ 麥當勞 Mcdonalds	No.88-2, Sec. 3, Xincheng S. Rd.	02-2362-0668	09 Min
➤ 肯德基 KFC	No.96-1, Sec. 3, Xincheng S. Rd.	02-2364-9867	09 Min

### Italian

Restaurant	Address	Phone	Est Walking Time
➤ 堤香義大利麵 Titian Pasta	No.48-2, Taishun St.	02-2366-1385	06 Min
➤ SO FREE Pizza比薩	No.19, Ln. 86, Sec. 3, Xincheng S. Rd.	02-2364-3351	09 Min
➤ ANTICO FORNO Pizza	No.141, Rui' an St.	02-2706-3322	12 Min
➤ Blue Bricks磚塊義法廚房	No.169, Sec. 2, Xinhai Rd.	02-2738-5014	13 Min

### Chinese

Restaurant	Address	Phone	Est Walking Time
➤ 莫宰羊 Mo Zaiyang Lamb	No.28, Sec. 3, Xincheng S. Rd.	02-2369-1466	01 Min
➤ 至香園 jihì siàng yuán	No.50, Sec. 3, Xincheng S. Rd.	02-2369-2446	03 Min
➤ 鳳城燒臘粵菜 fòng chéng	No.58-2, Sec. 3, Xincheng S. Rd.	02-2363-3772	05 Min
➤ 七里亭 ci li tíng	No.8, Ln. 333, Sec. 3, Roosevelt Rd.	02-2391-6792	10 Min

### Coffee Shops

Restaurant	Address	Phone	Est Walking Time
➤ Galette葛樂蒂咖啡館	No.136, Sec. 1, Xinhai Rd	02-2362-2585	02 Min
➤ Starbucks	No.42-1, Sec. 2, Heping E. Rd.	02-2363-9331	07 Min
➤ Louisa Coffee 路易莎咖啡	No.228, Sec. 1, Heping E. Rd.	02-2362-0860	07 Min
➤ 極簡 Minimal café	No.42, Ln. 2, Taishun St.	02-2362-9734	10 Min

### Markets

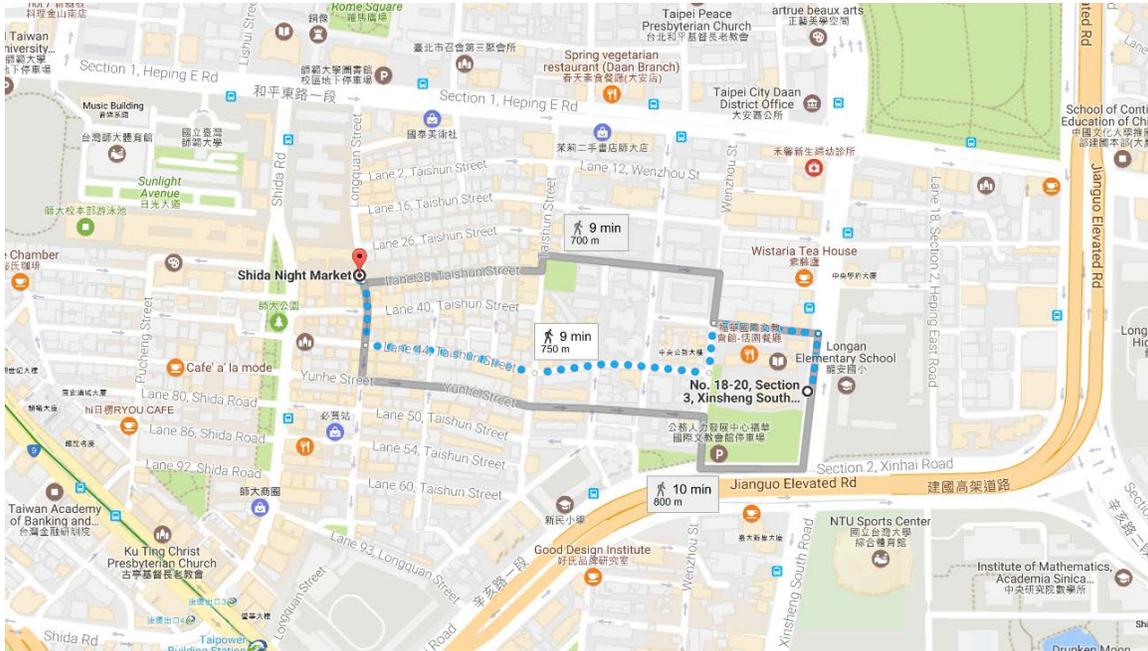
Store Name	Address	Phone	Est Walking Time
➤ 頂好 Wellcome	No.2, Sec. 3, Xincheng S. Rd.	02-2368-6191	03 Min
➤ 全聯 TransUnion	No.45, Taishun St.	02-2362-0475	06 Min

### Convenience Stores

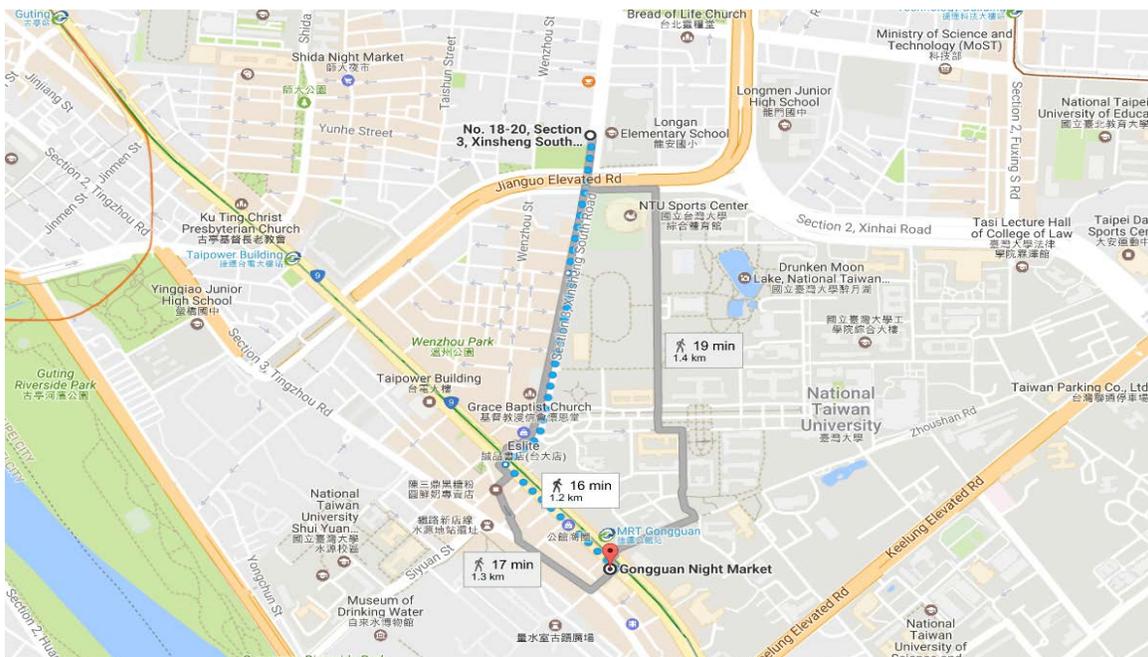
Store Name	Address	Phone	Est Walking Time
➤ 7-ELEVEN	No.266, Sec. 1, Heping E. Rd.	02-2362-3019	05 Min
➤ 全家 familymart	No.22, Sec. 2, Heping E. Rd.	02-8369-1009	06 Min

## Local Activities

For information on places to go and things to do in [Shida Night Market, Da'an](#):



For information on places to go and things to do in [Gongguan Night Market, Zhongzheng](#):



For information on places to go and things to do in [National Taiwan University\(NTU\)](http://www.ntu.edu.tw/english/index.html):  
<http://www.ntu.edu.tw/english/index.html>

For information on places to go and things to do in [National Taiwan Normal University\(NTUN\)](http://en.ntnu.edu.tw/):  
<http://en.ntnu.edu.tw/>

For information on places to go and things to do in [Daan Park](http://eng.taiwan.net.tw/m1.aspx?sNo=0002090&id=5815):  
<http://eng.taiwan.net.tw/m1.aspx?sNo=0002090&id=5815>







THANK YOU FOR ATTENDING  
THE 2017 TAIWAN USERS GROUP MEETING  
Monday, April 24 – Friday, April 28, 2017



SAVE THE DATE FOR THE  
FALL USERS MEETING & VARSKIN TECHNICAL MEETING  
WASHINGTON D.C.  
OCTOBER 16 – 20, 2017

