

# Group Scientific Visit on the State of Art Knowledge of Advanced Nuclear Power Reactor Designs with Educational Tools Supporting Regional Human Capacity Development

North Carolina State University, Raleigh, North Carolina, USA

9 – 13 September, 2019

*The host institute is North Carolina State University's Department of Nuclear Engineering (NED). The Department is the only nuclear engineering program in North Carolina and a premier nuclear engineering department in the United States. It is home to the first university-based nuclear reactor and associated Nuclear Reactor Program dedicated to teaching, research and extension. It is also the lead university in the Consortium for Advanced Simulation of Light Water Reactors (CASL) with the mission to advance computer simulations to create safer, more cost-effective nuclear power plants, and in the Consortium for Nuclear Power (CNP) with the mission to promote research and development, innovation, education, and training as well as provision of technical support/expert advice/consultancy services that benefit the nuclear industry and its regulation.*

**Local visit host and logistic coordinator – Lisa Marshal**

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# AGENDA

**DAY 1: MONDAY 9 September 2019**  
**1121 Burlington Labs (Duke Energy Conference Room)**  
**2500 Stinson Drive, Raleigh, NC 27695**

TOPIC	TIME	RESPONSIBLE
1. Opening and Welcoming	<b>9:30</b>	Ms Tatjana Jevremovic (IAEA)
2. Welcome Remarks from NED, NCSU	<b>9:45</b>	Mr Yousry Azmy (NCSU)
3. Introduction of participants	<b>10:00</b>	ALL
Assessment QUIZ	<b>10:20</b>	Participants
BREAK & GROUP PHOTO Sponsored by NED	<b>10:45</b>	ALL
4. SV scope and expectations Explanation about the tours	<b>11:00</b> <b>11:15</b>	Ms Tatjana Jevremovic (IAEA)
5. IAEA research activities relevant to advanced WCR technology development	<b>11:30</b>	Ms Tatjana Jevremovic (IAEA)
LUNCH BREAK	<b>12:30</b>	ALL
6. Physics and technology of advanced WCRs		Mr Nam Dinh, Mr Xu Wu, Mr Mihai Diaconeasa (NCSU)
6.1. Defense in depth, normal operation, transient and accident states in advanced WCRs	<b>14:00</b>	
6.2. Evolutionary and innovative WCR designs	<b>15:00</b>	
6.3. Passive safety systems	<b>16:00</b>	
BREAK Sponsored by NED	<b>16:45</b>	ALL
6.4. IAEA classification of advanced reactors and the IAEA PRIS, ARIS and	<b>17:00</b>	Ms Tatjana Jevremovic (IAEA)

THERPRO data bases		
<b>"ON THAT DAY"</b>	<b>17:45</b>	NCSU Student (Prepared by IAEA Interns)
<b>18:00 Adjourn</b>		
<b>DAY 2: TUESDAY 10 September 2019 1121 Burlington Labs (Duke Energy Conference Room) 2500 Stinson Drive, Raleigh, NC 27695</b>		
<b>TOPIC</b>	<b>TIME</b>	<b>RSPONSIBLE</b>
<b>"ON THAT DAY"</b>	<b>9:30</b>	NCSU Student (Prepared by IAEA Interns)
7. Physics and technology of advanced WCRs demonstrated with computer-based simulators (learning hands-on exercises and assessment tests are included)		
7.1. IAEA education and training activities on advanced reactor technologies with NPP basic principle simulators	<b>9:45</b>	Ms Tatjana Jevremovic (IAEA)
7.2. Introduction to the generic PWR simulator at NCSU	<b>10:15</b>	Mr Jason Hou (NCSU)
<b>BREAK</b> Sponsored by NED	<b>11:00</b>	ALL
7.3. Generic PWR simulator: Demonstration	11:15	Mr Jason Hou (NCSU)
<b>LUNCH BREAK</b>	<b>12:30</b>	ALL
7.4. Generic PWR simulator: Exercises	<b>14:00</b>	Mr Jason Hou (NCSU)
<b>BREAK</b> Sponsored by NED	<b>15:45</b>	ALL
7.5. Generic PWR simulator: Group assignment with	<b>16:00</b>	Mr Jason Hou (NCSU)

assessment test		
7.6. Assessment test: Discussion	<b>17:30</b>	Mr Jason Hou (NCSU) Ms Tatjana Jevremovic (IAEA)
<b>18:00</b> <b>Adjourn</b>  <b>18:15</b> <b>Reception sponsored by NED</b> <b>Talley Building</b>		
<b>DAY 3: WEDNESDAY 11 September 2019</b>		
<b>TOPIC</b>	<b>TIME</b>	<b>RSPONSIBLE</b>
<b>"ON THAT DAY"</b>	<b>9:30</b>	NCSU Student (Prepared by IAEA Interns)
8. Technical tours at NCSU with presentations by faculty and researchers: 8.1. Nuclear reactor program 8.2. Overview of PULSTAR facility 8.3. Exercises and demonstrations of reactor operational principles 8.4. Internet reactor laboratory: Overview and demonstrations	<b>10:00</b> <b>10:30</b> <b>11:00</b>	Mr Ayman Hawari (NCSU)
<b>LUNCH BREAK</b>	<b>13:00</b>	<b>ALL</b>
<b>Technical tour to Shearon Harris NPP</b>	<b>13:30</b>	<b>Ms Lisa Marshall (NCSU)</b>
A valid government issued photo ID (eg passport) is needed. The attire necessary includes trousers and closed shoes (back and front). The shoes needs to be flat or very low 1" or lower.		

Any recording items, including smartphones, need to be left in vehicles

Raleigh, North Carolina, USA

Harris Nuclear Plant, 5421 Shearon Harris Rd, New Hill, NC 27562, USA

29 min (24,3 mi) via US-1 S

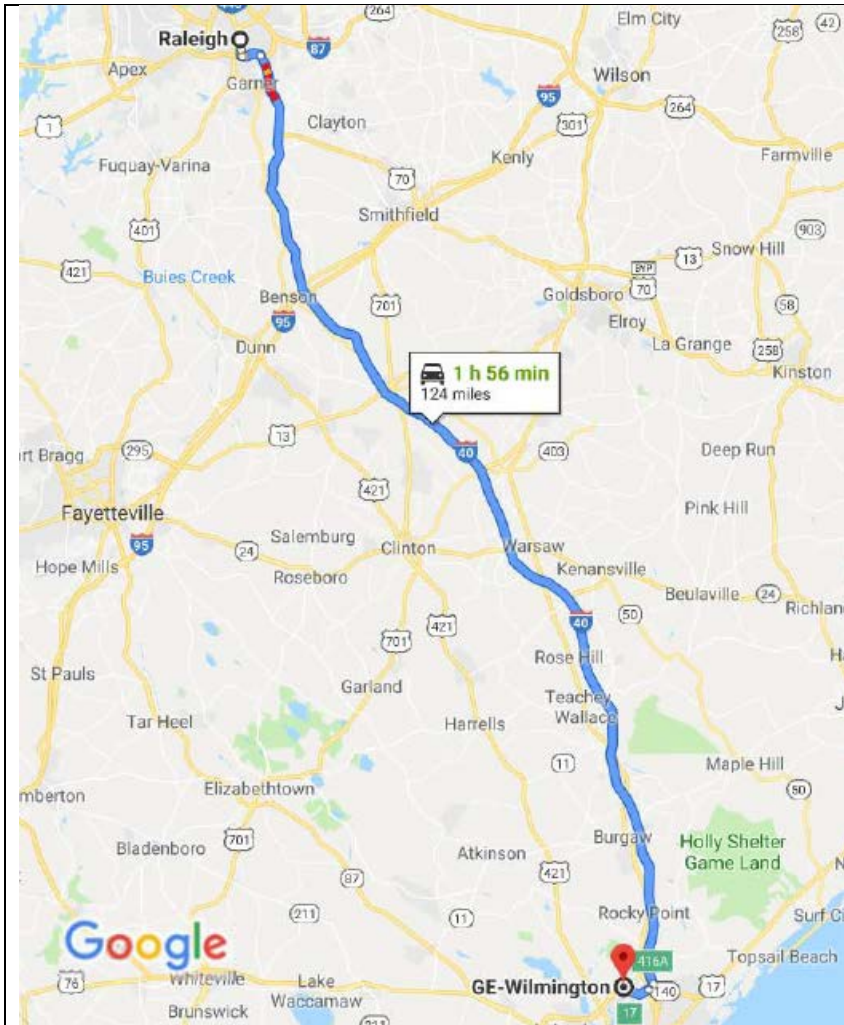
31 min (24,9 mi) via I-440 W and US-1 S

Directions

**18:00 Adjourn**

**DAY 4: THURSDAY 12 September 2019**

TOPIC	TIME	RESPONSIBLE
<b>"ON THAT DAY"</b>	<b>9:30</b>	NCSU Student (Prepared by IAEA Interns)
<b>Technical tour to GEH factory</b>	<b>10:00</b>	<b>Ms Lisa Marshall (NCSU)</b>



A valid government issued photo ID (eg passport) is needed. The attire necessary includes trousers and closed shoes (back and front). The shoes needs to be flat or very low 1" or lower. Any recording items, including smartphones, need to be left in vehicles 2 hours driving time

**18:00  
Adjourn**

## DAY 5: FRIDAY 13 September 2019

TOPIC	TIME	RESPONSIBLE
"ON THAT DAY"	9:30	NCSU Student

		(Prepared by IAEA Interns)
9. Overview of the IAEA activities on simulation and modeling of WCRs	<b>9:45</b>	Ms Tatjana Jevremovic (IAEA)
10. Technical tours at NCSU with presentations by faculty and researchers:		
10.1. Consortium for Advanced Simulation of Light Water Reactors: Overview and code demonstrations with examples; future plans	<b>10:15</b>	Mr. Scott Palmtag (NCSU)
10.2. Consortium for Nuclear Power: Overview, examples of activities	<b>11:00</b>	Ms. Jason Hou (NCSU)
<b>Assessment quiz</b>	<b>12:00</b>	Ms Tatjana Jevremovic (IAEA)
Closing remarks	<b>12:30</b>	Mr Mohamed Bourham (NCSU) Ms Tatjana Jevremovic (IAEA)
<b>13:00 Adjourn</b>		