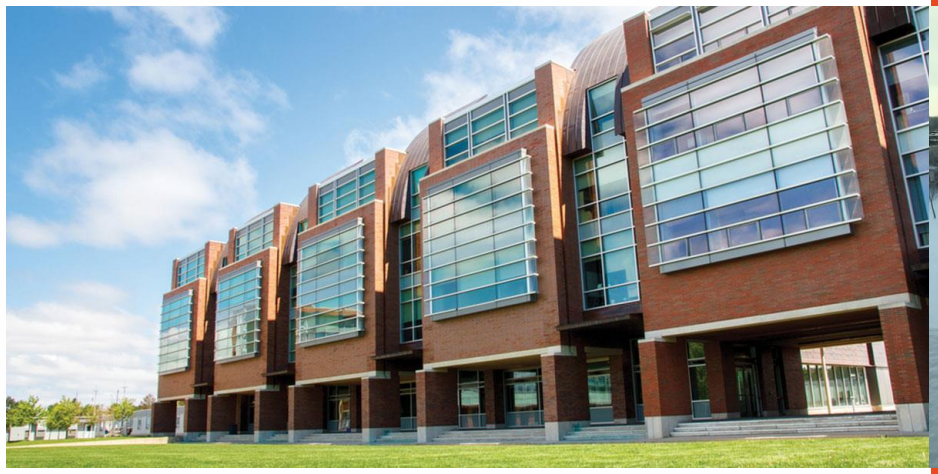
OntarioTech
Energy Systems
& Nuclear Science



Canada – Romania / UNENE meeting, March 2, 2021

Slides by Akira Tokuhiro (akira.tokuhiro@ontariotechu.ca)

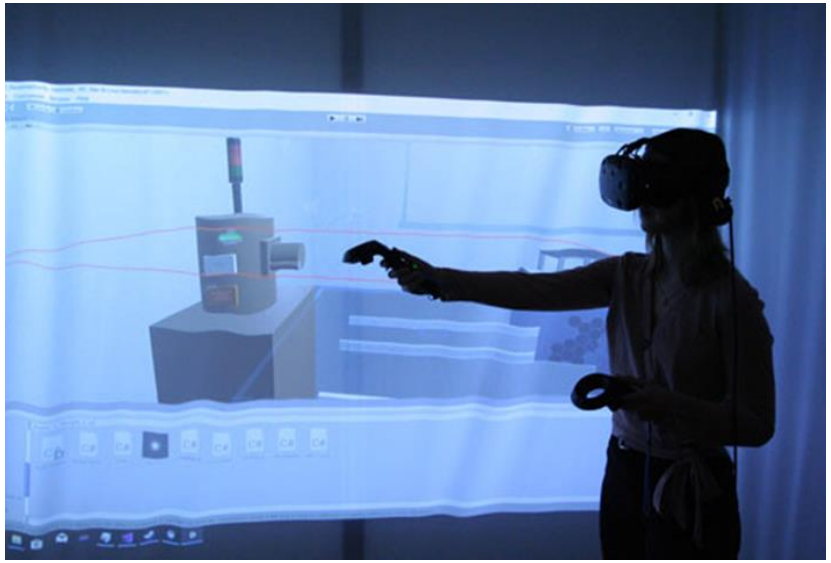
Summary of Ontario Tech University, Faculty of Energy Systems and Nuclear Science

Darlington Station simulator room

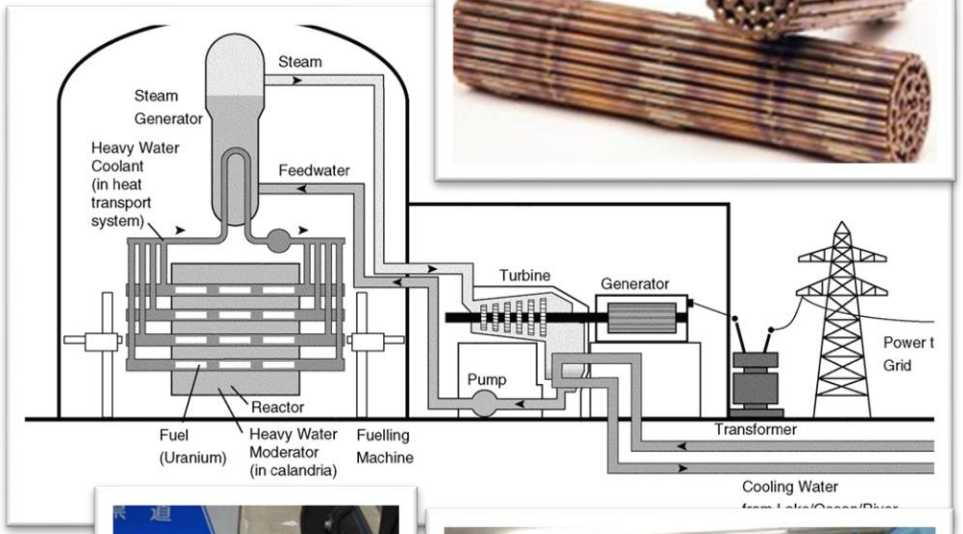
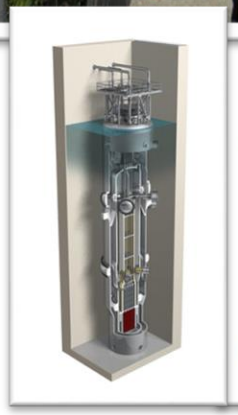
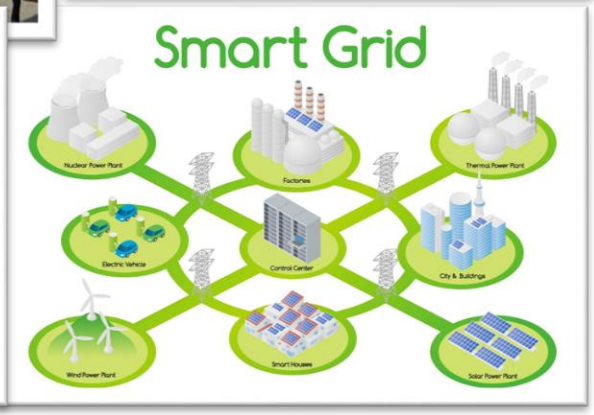
60km

Summary. Faculty of Energy Systems and Nuclear Science

- Ontario Tech University; 7 Faculties – two in engineering; Faculty of Engineering and, Faculty of Energy Systems & Nuclear Science
- Ontario Tech University. Started in 2003. Now about 9500 students.
- Located in Oshawa, Ontario, Canada; eastern edge of greater Toronto area (GTA), 60km from downtown area. Population, ~7-8 Million; Canada, 38 Million.
- Bachelor of Engineering (BEng), Nuclear Engineering (4 years); Bachelor of Science, Health Physics & Radiation Science (4 y); also M.S., Ph.D., M.Eng. – Master of Engineering, G.Dip.-Graduate Diploma
- Only BEng, NE, in Canada; 3rd in North America, number of graduate at Bachelor level. About 300 students; ~50-60 Bachelor/yr; about ~50 FT-full time/P(art)T graduate students
- First students in 2003; first graduates in 2007; reached 1000 graduates in 2020.
- Approximately 60% work in nuclear power company (OPG, Bruce Power) in Ontario; others at regulator (CNSC), R&D (CNL), major engineering firms (Kinetrics, SNC-Lavalin etc.)



19 faculty, 16 teaching in nuclear and energy; 19 with many research interests: nuclear reactor design & engineering, materials, operations, training, energy analyses; emerging areas: VR, simulations

R&D areas, potential collaborations

- **We have expertise, experience and interests in the following:**
  - CANDU reactor design, engineering, operations, training and related as standards, regulatory oversight.
  - Specific courses on CANDU plant systems such as steam supply systems, electrical systems.[Courses are delivered in English]
  - Emerging areas such as SMRs- Small Modular Reactors
- **Current, recent R&D areas**
  - Environmental radiation measurement, simulations and visualization; impacts such as in emergency response; VR-virtual reality
  - Energy systems engineering and controls; applications of plasma engineering, for example in non-nuclear waste processing; control systems in energy system components such as batteries, autonomous control; enegy systems - LCA
  - Applied thermodynamics and (nuclear) material engineering such as advancements in accident tolerant fuels, their properties and associated applications in computations
  - Ongoing developments of a 2-storey (9m) tall water-based heat transfer loop, with possible simulation of SMR thermohydraulics.
  - Ongoing developments in modeling & simulations in support of advanced reactor concepts