DigiDecom ELINDER 2020

Innovative Online Course on Nuclear Decommissioning
30 November - 11 December 2020

eLearning pre-course package
Package 1: is recommended for all interested
eLearning on decommissioning modules hosted by the IAEA https://ec.europa.eu/jrc/en/training-programme/elinder/e-learning For students who are not familiar with nuclear decommissioning it is recommended to complete at least modules 1, 2, 4 and 5 before the course
Package 2: will be provided for all who register
Advanced Information Management Systems *by iUS, Germany*
Costing for decommissioning – the International Structure for Decommissioning Costing (ISDC) *by WAI developer of Aquila costing, Slovakia*
Robotics in decommissioning *by Florida International University (FIU), Florida, US* and by *ENGIE, Belgium*
Innovative **radiological characterisation** techniques *by Createc, UK*
3D radiological simulation based techniques/tools for supporting safety management in decommissioning – introduction to the VRdose® tool family to be used for the exercises and interactive demonstrations of the course *by IFE, Norway*
40 Years of Decommissioning **Experiences** and Some **Key Take-Aways** *by Argonne National Laboratory, US*
Methodologies and tools for **decommissioning and waste management planning**, including project risk management related to project time and costs by *Sogin, Italy*
Human-Robot Interaction for Nuclear Decommissioning *by IFE, Norway*

Programme		
Welcome virtual get-together (introductions by all participants)	**27th November**	
Introductory session: Introduction/overview lectures	**30th November**	
Introduction to nuclear decommissioning and international perspectives Pierre Kockerols - European Commission	Online lecture	10:30
AI: take the bad with the good? Tomas Nordlander - IFE, Norway	Online lecture	11:15
BREAK / LUNCH		**12:00**
Digital transformation of nuclear decommissioning - Current practices and innovation needs István Szőke – IFE, Norway	Online lecture	13:00
Topical session group 1: Knowledge, project, and workforce management		
Human resource aspects and knowledge management for decommissioning Franz Borrmann - iUS, Germany	Online lecture	13:40
Building Information Management (BIM) technology - the Bimsync tool Dag Fjeld Edvardsen - Catenda AS, Norway	Online lecture	14:10
BREAK		**14:40**
Transitioning of Nuclear Power Plants from Operation to Decommissioning Dr. John Kickhofel, Managing Partner – Apollo+	Online lecture	15:10
Advanced ISDC based costing for nuclear decommissioning – The AquilaCosting tool Dusan Daniska - WAI s.r.o, Slovakia	Online lecture	15:50
Safety Demonstration and Argumentation for Decommissioning – The InStrucT tool Péter Kárpáti, Svein Tore Edvardsen & István Szőke - IFE, Norway	Online lecture	16:30
Topical session group 2: Safety and radiological protection	**4th December**	
Introduction to radiation protection – refresher on eLearning Franz Borrmann - iUS, Germany	Online lecture	10:30
Radiation protection exercise with classical method iUS, Germany	Exercise with online help	11:00
BREAK / LUNCH		**12:00**

3D simulation based real-time radiological simulation techniques István Szőke - IFE, Norway	Online lecture	13:00
Uncertainty management and reliability analysis for radiological simulation tools Lucy Murray - IFE, Norway	Online Lecture	14:00
BREAK		**14:30**
3D simulation and radiation visualisation based radiological protection focused job planning VRdose based demo - IFE & iUS Radiation protection focused work planning and safety demonstration for waste package inspection VRdose based exercise - IFE & iUS	Interactive demo / exercise with 3D streaming and remote collaboration	15:00
Discussion of learnings and results from the demos/exercises	Interactive online session	16:30
Topical session group 3: Robotics and radiation mapping	**8th December**	
Digital innovation for robotics applications in decommissioning – The HADRON centre István Szőke - IFE, Norway	Online lecture	10:30
Robotics and 3D gamma mapping technologies for supporting nuclear decommission Etienne Hocquard - CREATEC, UK	Online lecture	11:15
BREAK/LUNCH		**12:00**
Modular UGV based technology and applications Tomas Henninge - nLink, Norway	Online lecture	13:00
Humanoid robot platform based technology and applications Bernt Øivind Børnich and Egil Utheim - HALODI robotics, Norway	Online lecture wit streamed demonstration	13:45
BREAK/LUNCH		**14:30**
3D simulation based planning of radiation mapping mission with robot mounted 3D gamma mapping technology VR based demo - IFE, CREATEC & iUS 3D scanning based immersive briefing and training for radiological and safety awareness VR based exercise - IFE & iUS	Interactive demo / exercise with 3D streaming and remote collaboration	15:00

Discussion of learnings and results from the demos/exercises	Interactive online session	16:00
Introduction to robotics applications in decommissioning Leonel Lagos - Florida International University, Florida, US	Online Lecture	16:30
Topical session group 4: Waste management	**10th December**	
Decommissioning and waste management programme in Norway Peter Keyser / Martin Andreasson - Norwegian Nuclear Decommissioning (NND)	Online lecture	10:30
Advanced Methodology for Activation Characterization (AMAC) Dr Valentyn Bykov National Cooperative for the Disposal of Radioactive Waste (NAGRA)	Online lecture	11:00
Waste information management using blockchain technology (European Blockchain Partnership) Flaviano Bruno - Sogin, Italy	Online lecture	11:30
BREAK/LUNCH		**12:00**
3D simulation based job planning for removal of activated reactor internals at the Halden BW Reactor 3D simulation based waste repackaging process planning in a simulated waste management facility VRdose based demos - IFE & iUS Waste packaging optimisation principles with real-time 3D simulation and radiation visualisation VR based exercise - IFE & iUS	Interactive demo / game exercise with 3D streaming and remote collaboration	13:00
BREAK		**14:30**
Topical session 5: Examples and lessons learned		
Lessons learned from nuclear decommissioning projects and real-life examples Pierre Kockerols - European Commission	Online lecture	15:00
Lessons learned from nuclear decommissioning projects and real-life examples Francesca Onofrio - Sogin, Italy	Online lecture	15:45
Closing session: Final evaluation, ideas and facility visits	**11th December**	
Trainees prepare slides which identify and rate the top learnings (challenges, opportunities and lessons learned) from the course. IFE & iUS	Interactive online session (possibly in small chat groups)	10:30

BREAK/LUNCH		**12:00**
Extra time to meet in groups and finish slides if needed.		13:00
Presentations of slides from each group (with reflection on own experience if relevant) – Evaluation by the lecturers IFE & iUS	Interactive online session	14:00
BREAK		**15:00**
Discussions: feedback from the course and ideas for future courses IFE & iUS	Interactive online session	15:30
Online certificate handover ceremony IFE & iUS		16:00