ESARDA
European SAfeguards Research and Development Association
Working Group Training and Knowledge Management

Pool of Course Lecturers

Y. Aregbe
Responsible for analytical methods for nuclear material measurements at JRC Geel (IRMM)

J. Baute
Joined the IAEA in 1994 and became director of Iraq's Nuclear Verification Office. Presently he is director of the IAEA Safeguards Information Management Directorate

R. Berndt
Leads the nuclear measurements at the Performance lab in the JRC with large experience in gamma spectrometry

P. Daures
Worked as a nuclear engineer 10 yr at the CEA. He joined the JRC' Karlsruhe in 1994 to setup the OSL Lahague/Sellafield, moved to Ispra as TACIS coordinator

M. De Cort
For more than 20 years, he has been working as a Scientific Officer with the Radioactivity Environmental Monitoring (REM) group at JRC Ispra (ITU).

D. Dickman
Joined the Pacific Northwest National Laboratory in 1985, and is currently manager for Non proliferation and Global Threat Reduction Program

N. Edmons
Operations Support and Technical Manager in the Safeguards Department at Sellafield. He was Senior Nuclear Material Accountant for Magnox and Waste facilities .

P. Funk
Is since more than 10 years involved in French and Inter-national safeguards as leader of C/S lab at IRNS

K. Hamada
Senior post-doctoral fellow at the Integrated Support Center for Nuclear Nonproliferation and Nuclear Security (ISCN) at Japan Atomic Energy Agency (JAEA).

O. Jankowitsch
Ex head of the IAEA Office of External Relations and Policy Co-ordination, and formerly working at the Office of the IAEA Director General

T. Jonter
Is heading the Department of Economic History at the Stockholm University, leading educational programs on Nucl. Non proliferation at diff. univ. in former Soviet Union

G. Maenhout
joined in 2001 the nuclear safeguards unit at JRC Ispra and is part of the Belgian Nuclear Engineering teaching committee

Q. Michel
is Professor in European Studies and President of the Department of Political Science of Liège University

Y. Nagayama
Inspector Office for Nuclear Nonproliferation and Safeguards (JSGO) at the Ministry of Education, Culture, Sports, Science and Technology (MEXT)

J. Oddou
She joined the CEA in 2007 as Safeguards officer at the Comité Technique Euratom (CTE), French authority for safeguards implementation in France on nuclear material and related activities.

P. Peerani
Leads the physical modeling (e.g. Monte Carlo) for nuclear measurements (NDA, solution monitoring) at JRC Ispra with experience as analytical inspector

JP Robin
Analyst of facilities, particularly nuclear related installations, exploiting all types of imagery sensors at the Non-Proliferation Section of the European Union Satellite Centre in Madrid (SPAIN).

L. Rockwood
Joined in 1985 the Office of Legal Affairs of the IAEA and is Section Head for Non-Proliferation and Policy Making Organs

P. Schwalbach
Joined the EC as EURATOM inspector in 1992 & is heading the logistic support for nuclear material verification

M. Tarvainen
Principal Advisor at STUK, the Finnish Radiation and Nuclear Safety Authority, Office of Expert Services. His responsibilities include nuclear safeguards and security related questions at large.

L. Van Den Durpel
Scientific Director and International Expert at AREVA NC's Corporate Research and Innovation Directorate. Vice-President Strategic Analysis and Technology Prospective at AREVA's Corporate R&D.

M. Wallenius
Works on destructive assay measurements and is responsible for nuclear forensics at JRC Karlsruhe (ITU)

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10th ESARDA COURSE
Nuclear Safeguards and Non Proliferation

Ispra, Italy, March 18th – 22nd, 2013

Organised by the European Safeguards Research & Development Association, WG TKM

Hosted by the Nuclear Security Unit, Joint Research Centre Ispra, Italy

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Origin of the course

The knowledge retention problem in the nuclear field was acknowledged by the OECD in 2000. The United Nations study on disarmament and non-proliferation education (2002) made detailed recommendations for urgently required improvements. ESARDA, the European Safeguards Research and Development Association reacted to these shortcomings with a strategy to tackle the problem and created a Working Group on Training and Knowledge Management (ESARDA WG TKM). The final objective of the ESARDA WG TKM is the setup of academic course modules to an internationally recognised reference standard.
This project is in line with the movement of establishing a European curriculum for Nuclear Engineering. Teaching in the Nuclear Safeguards field is indeed strongly influenced by national history so the objective of the course is to provide homogeneous material in Nuclear Safeguards and Non-Proliferation matters at the European and international level.

Learning objectives

This compact course is open to masters degree students, in particular nuclear engineering students, but also to young professionals and International Relations/ law students. It aims at complementing nuclear engineering studies by including nuclear safeguards in the academic curriculum.
The basic aim of the course is to stimulate students´ interests in safeguards. The course addresses aspects of the efforts to create a global nuclear nonproliferation system and how this sytem works in practice: the Treaty on Nonproliferation of Nuclear Weapons (NPT), safeguards technology, and export control. Also regional settings, such as Euratom Treaty, are presented and discussed. The course deals in particular with technical aspects and application of safeguards; i.e. how to implement the safeguards principles and methodology within the different nuclear facilities. Therefore the course will create an overview on inspections techniques, ranging from neutron/ gamma detectors, to design information verification, to environmental sampling, etc.

Course content

Introduction: *The evolution of the Non Proliferation Treaty -regime, safeguards, international control regimes in theory and practice, and present trends in the nuclear nonproliferation efforts.*

What is safeguarded: *Definition of nuclear material that is subject to nuclear safeguards and related safeguards goals (significant quantity, timeliness and detection probabilities)*

Where is it found: *Description of the nuclear fuel cycle from mining to final repository, focussing on enrichment in the front-end and reprocessing in the back-end*

Which legal protection means exist: *Overview on international and regional Non-Proliferation Treaties and established Institutions and Organisations*

What is the methodology to verify: *Nuclear material accountancy principles and statistics of auditing*

How are inspections performed: *Overview on inspector tools and their use to verify the nuclear activities as declared under the safeguards agreements (Non Destructive Assay, Monitoring, Containment/ Surveillance); additional safeguards measures under the Additional Protocol (complementary access, satellite imagery, environmental sampling) and how they are applied in field (storage facility, process facility, enrichment facility, research institute, spent fuel transfer)*

How to control Import/ Export: *Guidelines of the Nuclear Suppliers Group, trigger list and dual-use list. Means to combat illicit trafficking, inclusive nuclear forensics*

What additional information offers: *Collection of open source data and demonstration of some case studies (Iraq, 1993)*

Practical organisation

The course features a full five-days program with 1h lectures by experts in the field of nuclear safeguards, visits to five safeguards laboratories and some classroom exercises.

The course material, consisting of a syllabus, a complete set of presentations and literature, will be provided to the participants. It is recommended that the students prepare themselves with the reading material on the website

For this limited enrolment course early registration is recommended. A numerus clausus of 60 is introduced. Under the website http://esarda2.jrc.it/about/index.html *you find the registration form that has to be completely compiled and sent to* JRC-NUSAF-SECRETARIAT@ec.europa.eu *before the deadline of 20th December 2012. University students can apply for accommodation free of charge, but only a limited number of places per university are available. Travel costs are not reimbursed by the JRC.*

There is no course fee; lunches are offered free of charges.

All participants are encouraged to make an essay on a given topic selected from the list, which is handed out at the end of the course. Up to 2 best essays can be selected for being published in the ESARDA Bulletin or for being presented in the poster session at the next ESARDA Symposium.

Students can include this course, recognised by BNEN/ENEN for 3ECTS, in their academic curriculum. To be quoted for this course an additional Take-Home-Exam is foreseen.

Venue: *JRC Ispra, Building 36, Amphitheatre*

Schedule: *From Monday, March 18th 2013 at 8:30*
till Friday, March 22°, 2013 at 18:00

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