A 5-Day Short Course

Technical Management Services, Inc.

Internal Dose Assessment

January 4-8, 2021 ◆ Live Instruction Online

This 5-day course has been developed for health physicists, Radiation Safety Officers, regulators, program auditors and anyone having responsibilities relating to personnel dose assessment.

The course takes the student through the fundamentals of internal dosimetry, including historical and current dose models, to the analysis of actual intakes. The focus of this course is the utilization of both in vitro and in vivo bioassay results in the determination of intake and dose. A significant amount of time is devoted to calculations using actual intake scenarios. Practical applications of data and interpretation of bioassay results are stressed. Discussions include identifying the source term, collection of pertinent data, application of retention functions, and determination of required bioassay technique sensitivities and identification of analytical parameters which impact the validity of in vivo and in vitro bioassay results.

The student will become familiar with the use of current documents and references. Bioassay program development and Quality Assurance for bioassay programs will also be discussed. Importantly, the course will consider application and use of perhaps the most powerful internal dosimetry software package currently available: The Integrated Modules for Bioassay Analyses (IMBA). Customization of the course to address site specific applications is optional for on-site courses, please contact TMS for further information.

The course has application to commercial power reactors, pharmaceutical manufacturers, regulatory agencies, university programs, government laboratories, private industry, fuel fabricators, in short; any program involved in handling dispersible radioactive materials where there is a potential for intakes. Students are encouraged to provide scenarios to the instructor prior to or during the course for review and discussion during the course.

This short course will help you....

- Understand what you are really signing when you put your signature on the “reviewed by” line on the in vivo or in vitro bioassay report or that dose assessment.
- Identify bioassay techniques and analysis sensitivities appropriate for the source term and bioassay counting/sampling schedule.
- Appropriately apply dose models, retention functions and dose coefficients to the estimation of intake and dose.
- Interpret real world bioassay data, including the analytical parameters which impact the validity of the data.
- Understand and apply NRC and/or DOE regulatory guidance in the estimation of dose.
- Design a bioassay program which is appropriate to the site, including bioassay methods, bioassay frequencies, quantifying potential missed dose, reporting requirements, identifying Data Quality Objectives for bioassay and Quality Assurance.

Course Outline....

Fundamentals

Dose Models

- Historical models and the central theme of internal dosimetry
- ICRP 26 and ICRP 60 guidance

The current internal dosimetry system: ICRP 30, 60, 66, 67, 78, 100 and the future!

- Structure of the models
- Application of the models
- Interpretation of Bioassay Measurements and application of intake retention fuctions
- Regulatory guidance

Integrated Modules for Bioassay Analysis (IMBA)[1]

- Examples, examples, examples

Bioassay programs

- Approaches to in vivio and vitro sampling and analysis
- Detection Limits and Sensitivity
- Bioassay Programs
- Calibrations
- QA/QC

[1]The Health Protection Agency of the United Kingdom (HPA) has committed to providing limited license software for particpants during the class period with special pricing options thereafter.

Course Instructor

Dr. Richard Brey is currently a professor of Health Physics at Idaho State University.

Dr. Richard Brey received his Ph.D. from Purdue University in Health Physics in 1994. He has engaged in a wide variety of research projects varying from radiation physics and detection to agricultural applications of radiation and radiation producing machines, this list importantly includes internal dosimetry; in which he has engaged in various collaborative efforts including the evaluation of historical exposures, evaluation of animal experimental data, and redefining/evaluating radioactive material translocation models. As a byproduct of these efforts he has published over 45 peer reviewed scientific publications and presented more than 130 times in various scientific venues. He was the 2002 recipient of the Health Physics Society's Elda E. Anderson award for his contributions to the profession in research and service. During the spring of 2013, he was elected to serve as a Council member of the National Council of Radiation Protection and Measurements. Since 1995 he has been the director of an environmental radioanalytical laboratory which performs approximately 1,200 sample analyses per quarter, and the Director of the ISU Health Physics Program. Through 2005 until 2011 he served as the Director of The ISU Technical Safety Office and University Radiation Safety Officer. Between 2009 and 2010 he served as the Interim Chair for the ISU Department of Physics. Between 2004 and 2007 he served as a commissioner for ABET's Applied Science Commission representing the Health Physics Society. Between 2007 and 2011 he served as Commissioner at Large for the ABET Applied Science Accreditation Commission. He served as Associate Chair for the Department of Nuclear Engineering and Health Physics between 2010 and 2013 when he was appointed as the chair of that department. He assumed the duties of Interim Dean of the College of Science and Engineering on July 1, 2013.

Course Agenda:

January 4.....Introduction and Fundamentals
January 5.....Fundamentals continued
January 6.....Fundamentals continued and MDA/MDC, DIL
January 7.....IMBA training and brief introduction to the logic of the Eurados IDEAS concept
January 8.....Completion of IMBA and IDEAS and time permitting, training on Taurus

COURSE FEE: $1295
$50 discount for two or more registrants from the same company

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