RADIOCHEMISTRY AND GAMMA SPECTROSCOPY

TRAINING | JANUARY 11TH - 15TH

INSTRUCTORS

Larry Wolfe has worked in the industry since 1987 and brings an unmatched depth of knowledge to Nuclear Power Radiochemistry theory and fundamentals as a utility employee as well as an industry consultant. Larry has had several roles as an Adjunct Professor for college level chemistry courses including lecture and laboratory content and has actively supported the Power Plant Chemistry Advisory Group (PPCAG) for many years.

Dr. Robert Litman has been in the industry since 1981 providing radiochemistry program leadership, training and mentoring continuously since the start of his career. Dr. Litman has also authored or co-authored many publications for recognized organizations and agencies including USNRC, MARLAP, USEPA, and ASTM.

This course provides practical, hands-on information and techniques for personnel responsible for the radiochemistry program, unit chemistry, radioactive effluents, health physics, and chemistry training activities.

Training materials and activities are expertly designed to support, strengthen, and increase the knowledge and proficiency of program owners.

COURSE DESCRIPTION

Through this course, students develop a deeper knowledge of radiochemistry principles, instrumentation and software functions, effective review of gamma spectroscopy data and reports, nuclide decay study protocol and results, and the relative importance of these elements. Training materials and activities are expertly designed to support, strengthen, and increase the knowledge and proficiency of program owners.

WHO SHOULD ATTEND

Newly assigned program owners, backup program owners, and personnel with 2 to 5 years of experience, as well as long-term incumbents in Radiochemistry programs, are encouraged to attend this training course. Regardless of where you are in your career, this class offers valuable opportunities to expand your knowledge, gain new perspectives, and connect concepts that can help solve technical challenges. Radiochemistry programs are highly specialized, and many sites have limited local expertise available to provide technical oversight or support. This training serves as a forum for building an industry-wide network of peers and subject matter experts who can provide ongoing technical guidance and support as you develop, enhance, and maintain a robust program.

EVENT DETAILS

Event Date: *Monday, January 11th - Friday, January 15th 2027*

Daily Duration: *8:00 a.m. to 5:00 p.m.*
(Friday 8:00 a.m. to 12:00 p.m.)

Individual Price: *$2,700 (Includes snacks and lunch)*

Location: *St. Lucie Nuclear Plant*
6501 S. Ocean Dr., Jensen Beach, FL 34957

REGISTRATION

www.structint.com/radiochemistry-and-gamma-spectroscopy-training-2027

COURSE OUTLINE

MODULE	MODULE TITLE	CONTENT
1	Chart of the Nuclides; Interactions of Gamma Rays with Matter; Radioactive Decay Equations	■ Radiochemistry fundamentals ■ Alpha, beta and gamma particles interaction with matter ■ Organization of the Chart of the Nuclides and usage ■ Identify the three interactions of gamma rays with a detector that cause distinctive features in the gamma ray spectrum ■ Find the location of a Compton edge for a gamma ray given a graph of edge location versus gamma ray energy ■ Explain how sample background activity changes as function of time ■ Describe how beta particle emission gives rise to gamma ray spectrum background
2	Instrument Calibration, System Components and Detection Interactions; Software Algorithms; Activity, Background and Delayed Counting	■ Detector system components and their functions ■ Gamma ray detectors - types and analysis of gamma ray peaks ■ Detector instrument calibration types and factors of the calibration process ■ Efficiency calculation and requirements ■ Discuss the functions of several different software algorithms and how they can affect the gamma spectrometric analysis ■ Identify and perform calculations using basic decay equations ■ Define the following terms: • Gamma ray abundance, Abundance factor, Half-life ratio, Key line, Double escape peak, Random sum peak, Single escape peak, Coincidence sum peak, Weighted mean average activity, concentration
3	Chemistry of Power Operations; Reactor Coolant Radioactivity; Fuel Performance Monitoring	■ Reactor Coolant chemistry control of oxygen as it relates to the transport of corrosion products ■ Fission types and sources ■ Neutron distribution, fission yields, and fission decay chains ■ Transuranics activation ■ Neutron and proton production in the reactor ■ Sampling time and radionuclide sampling ■ Fundamental system chemistry environments ■ Formation of corrosion products and the transient crud layer ■ pH, zinc, hydrogen and noble metal chemistry programs ■ Clean Up System flow and components of the system ■ Fuel defects, the types of defects and effect on radionuclides
4	Gamma Spectrometry Data Review; Examples of Review Issues	■ Data review process ■ Provide specific examples and explanations of gamma spectrometry printouts that contained incorrect information ■ Practice problems from actual gamma spectra
5	Decay Study	■ Perform data analysis for a decay study ■ Develop example recommendations for results obtained relative to the Radiochemist and the Unit Chemist (what does it all mean?)

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