MicroShield® Training Objectives – Two Day Class

Introduction

MicroShield® is a comprehensive photon/gamma ray shielding and dose assessment program that is widely used for designing shields, estimating source strength from radiation measurements, minimizing exposure to people, and teaching shielding principles. MicroShield® is useful to health physicists, waste managers, design engineers, and radiological engineers and only requires a basic knowledge of radiation and shielding principles.

MicroShield® is fully interactive and utilizes extensive input error checking. Integrated tools provide graphing of results, material and source file creation, source inference with decay (dose-to-Ci calculations accounting for decay and daughter buildup), projection of exposure rate versus time as a result of decay, access to material and nuclide data, and decay heat calculations.

Course Outline

The class is broken into two sections. Day one covers an overview of radiation physics to ensure all students are familiar with the basic concepts of dose and shielding assessments. These concepts include defining ionizing radiation, photon interactions with matter as well as health physics basics. The main functions of the MicroShield® are introduced and training emphasizes the systematic solution process of defining

- the source / shield configuration (geometry)
- source and shield materials
- source terms
- build up factors
- numerical solution parameters

At the end of the first day all major functions of the MicroShield® software are covered and serves as an introduction to the use of the software.

Day two covers the advanced tools and features of the software including creating external source files, importing source terms, source decay and group, custom material development as well as the time dependent exposure rate and source inference correlation tools. These features and tools build upon the basics covered in day one and include a thorough explanation of the advanced features of MicroShield®.

Both days include a combination of instructor lead lectures with hands-on examples based on real work benchmarks or evaluations. After the end of the two day sessions, the student will be able to

1. Select the optimum geometry to conservatively perform the assessment
2. Select materials which provide a balance between as built conditions and data library relevance
3. Input source terms in a variety of methods to conservatively model the radiation
4. Select the best build up material to provide
5. Perform dose assessment and shielding evaluations for exposures in air as well as absorbed doses and dose equivalents
6. Use the source interface algorithm to back calculated sources from known dose rates