

Appendix A: Safety Basis Academy Courses, Available as of September 2009

Appendix A is a complete list of SBA courses, their NTC and LANL course reference numbers, and brief course descriptions.

Safety Basis Overview

NTC-SAF-701 LANL-EDS-39695

The Safety Basis Overview course is designed to familiarize new Safety Analysts with safety basis concepts, principles, and processes implemented throughout the Department of Energy. The safety analysis requirements and processes for different types of DOE facilities will be discussed, along with a basic safety analysis process.

This is a 2-day course.

Hazard Identification

NTC-SAF-720 LANL-EDS-44657

The Hazard Identification course is designed to provide Safety Analysts with the working knowledge and skills needed to identify, record, and screen all known facility hazards. The course covers the process used to identify and inventory hazardous materials and energy sources associated with a facility process or associated operation.

This is a 1-day course.

Hazard Evaluation Techniques I

NTC-SAF-735 LANL-EDS-42463

The Hazard Evaluation Techniques I course focuses on general process and detailed process hazard studies. Techniques covered include (1) Checklist Analysis, (2) Preliminary Hazard Analysis (PHA), (3) What-If Analysis, (4) What-If/Checklist Analysis, (5) Hazards and Operability (HAZOP) Analysis, and (6) Failure Modes and Effects Analysis (FMEA). This course provides the working knowledge and skills needed to perform a comprehensive assessment of facility hazards and to provide a qualitative risk perspective to help in decision-making for risk reduction. These evaluation techniques may be used to perform hazard analyses at a DOE facility.

This is a 5-day course.

Hazard Evaluation Techniques II

NTC-SAF-740 LANL-EDS-42464

The Hazard Evaluation Techniques II course focuses on hazard evaluation techniques normally used in special situations requiring detailed analysis of one or more specific hazardous situations. The four techniques covered require specially trained and skilled practitioners. These techniques should only be used on tightly focused problems because they require significantly more time and effort to perform than do the more broad-brush approaches. Techniques covered include (1) Fault Tree Analysis, (2) Event Tree Analysis, (3) Hazard and Barrier Analysis, and (4) Human Reliability Analysis. This course provides working knowledge and skills needed to perform a comprehensive assessment of facility hazards and to provide a risk perspective to help in decision-making for risk reduction. These evaluation techniques may be used to perform hazard analyses at a DOE facility.

This is a 2-day course.

Analytical Modeling Techniques Overview

NTC-SAF-750 LANL-EDS-44903

The Analytical Modeling Techniques Overview course is designed to familiarize Safety Analysts with selected analytical modeling codes (DOE Toolbox Codes) used in accident analyses in support of DOE facility safety basis document development. Upon completion of the course, participants will be able to (1) describe the purpose of analytical modeling in accident analysis, (2) describe the types of design-basis accidents each Toolbox code is best suited to model, (3) describe major strengths and limitations of each analytical modeling in the DOE Safety Analysis Toolbox, and (4) recommend the most appropriate analytical code(s) to model selected DOE facility design-basis accidents.

This is a 2-day course.

Accident Analysis Techniques

NTC-SAF-780 LANL-EDS-44899

The Accident Analysis Techniques course provides baseline knowledge and skills needed to understand the formal quantification of a limited subset of accidents from the hazard evaluation of a nuclear and nonnuclear facility. The course also covers the general process used to carry forward a limited subset of accidents that bound the envelope of accident conditions to which facility operation could be subjected.

This is a 3-day course.

Specific Hazards Analysis

NTC-SAF-730 LANL-EDS-44897

The Specific Hazards Analysis course provides baseline knowledge and skills needed to understand the interrelationship between the safety basis program and the facility safety requirements associated with fire protection, natural phenomena hazards mitigation, aircraft crash analysis, and explosion modeling analysis. The course also covers the general approach used for performing a conservative analysis of the risk posed by a release of radioactive or hazardous chemical material resulting from an aircraft crash into a facility containing these materials.

This is a 3-day course.

Nuclear Safety Management (10 CFR 830)

NTC-SAF-715 LANL-EDS-44902

The Nuclear Safety Management course provides a working-level knowledge of the safety basis program and facility safety requirements to satisfy 10 CFR 830, *Nuclear Safety Management*, as implemented by the Department of Energy. The course also addresses, in general, methods used to prepare and document the safety basis of DOE facilities.

This is a 1-day course.

Technical Safety Requirements Developer

NTC-SAF-785 LANL-EDS-17077

The Technical Safety Requirements Developer course is designed to provide Safety Analysts with the baseline knowledge and skills needed to develop technical safety requirements (TSRs) in accordance with requirements of 10 CFR 830 and concepts from DOE Guide 423.1-1, in a manner that is acceptable for NNSA approval.

This is a 4-day course.

Hazard Categorization

NTC-SAF-725 LANL-EDS-44900

The Hazard Categorization course provides the working-level knowledge and skills to determine nuclear facility hazard categorization preliminary to conducting hazard and accident analyses. It also addresses the final facility hazard categorization. The course builds on the material addressed in the Safety Basis Overview and Nuclear Safety Management courses.

This is a 1-day course.

Safety Basis Document Preparation - Basics

NTC-SAF-705 LANL-EDS-44898

The Safety Basis Document Preparation Basics course is designed to provide requisite knowledge and understanding of DOE facility safety basis and safety requirements documentation for non-3009 (nonnuclear) hazardous facilities/activities. Upon completion of this course, the student will have a general knowledge and understanding of safety basis documentation requirements to contribute as a team member in the documentation of facility safety analyses and development of controls documentation for a DOE facility or activity.

This is a 2-day course.

Safety Basis Document Preparation – Advanced (DOE STD 3009)

NTC-SAF-710 LANL-EDS-42456

The Safety Basis Document Preparation Advanced course is designed to provide Safety Analysts with the knowledge and skills needed to develop a non-reactor nuclear facility Documented Safety Analysis (DSA) in accordance with requirements of 10 CFR 830, DOE Safe Harbor Standard 3009-94, and concepts from DOE Guide 421.1-2, in a manner that is acceptable for NNSA approval.

This is a 3-day course.

Airborne Release Fractions & Respirable Fractions

NTC-SAF-745 LANL-EDS-44901

The Airborne Release Fractions & Respirable Fractions course provides the working-level knowledge and skills needed to select the most applicable or representative airborne release fraction and respirable fraction (ARF/RF) values to estimate the potential airborne release of radiological materials.

This is a 3-day course.

Accelerator Facility Safety Basis

NTC-SAF-790 LANL-EDS-46066

The Accelerator Facility Safety Basis course is designed to provide the requisite knowledge and skills to comply with the DOE Accelerator Order and facility safety documentation requirements. Upon completion of this course, the student will (1) understand and have a working knowledge of the Accelerator Order [DOE O 420.2B, *Safety of Accelerator Facilities*], safety assessment document (SAD) and accelerator safety envelope (ASE) requirements, (2) be able to document significant hazards at the facility and its operations, and (3) be able to document the controls by which those hazards will be managed to an acceptable level of risk in a DOE Accelerator Facility.

This is a 2-day course.

Environmental Restoration, Deactivation & Decommissioning Safety Basis

NTC-SAF-783 LANL-EDS-50950

The Environmental Restoration, Deactivation & Decommissioning Safety Basis course provides the working-level knowledge and skills needed to understand the safety basis requirements and process as applied to the mission requirements for an ER/D&D facility. Course methods include lecture and discussion, as well as individual and group exercises. This course will use examples of fictional facilities that are late in their operational life and explore case studies of ER/D&D activities throughout the DOE complex.

This is a 3-day course.

Packaging and Transportation Safety Basis

NTC-SAF-795 LANL-EDS-46067

The Packaging and Transportation Safety Basis course provides the working-level knowledge and skills needed to understand the development of safety basis documentation necessary to support facility packaging and transportation operations. The course also covers the general processes used to meet safety and quality assurance requirements of Title 10 Code of Federal Regulations 830 and Departments of Energy and Transportation directives.

This is a 3-day course.

Chemical Facility Safety Basis

NTC-SAF-743 LANL-EDS-50949

The Chemical Facility Safety Basis course provides the working-level knowledge and skills needed to understand the safety basis program and the facility safety requirements associated with a DOE hazardous chemical facility. The course also covers the general process used to conduct chemical characterization and analysis.

This is a 3-day course.

MACCS2 Modeling Code

NTC-SAF-755 LANL-EDS-42457

The MELCOR Accident Consequence Code System 2 (MACCS2) Modeling Code course for safety basis applications is designed to provide Safety Analysts with the technical knowledge on key aspects of performing defensible radiological dispersion and consequence analyses, the requirements from DOE-STD-3009-94, Appendix A, and other related DOE documentation, and the skills needed to apply the MACCS2 code to support safety basis applications in accordance with the requirements of 10 CFR 830.

This is a 4-day course.

CFAST Modeling Code

NTC-SAF-760 LANL-EDS-42458

The Consolidated Model of Fire Growth and Smoke Transport (CFAST) Modeling Code course is designed to provide the Safety Analyst with a working-level knowledge of its use in accident analyses in support of preparation of DOE facility safety basis documents. The course covers the suitability of CFAST for modeling fire accidents, the strengths and weaknesses of CFAST, running CFAST, and use of model outputs in a documented safety analysis, all in accordance with the concepts from DOE-EH-4.2.1.4.

This is a 4-day course.

ALOHA Modeling Code

NTC-SAF-750 LANL-EDS-42460

The Areal Locations of Hazardous Atmospheres (ALOHA) Modeling Code course is designed to provide Safety Analysts with a working-level knowledge of the ALOHA modeling code used in accident analyses in support of DOE facility safety basis document development. Upon completion of the course, the student will understand (1) the suitability of the modeling code for calculating chemical source terms and resulting downwind concentrations, (2) the major strengths and limitations of the modeling code, (3) how to model selected DOE facility chemical emergencies, and (4) use of the modeling code outputs in support of facility safety basis documents.

This is a 2.5-day course.

EPIcode Modeling Code

NTC-SAF-775 LANL-EDS-42462

The EPIcode Modeling Code course is designed to provide Safety Analysts with a working-level knowledge of the Emergency Prediction Information Code (EPIcode) used in accident analyses in support of DOE facility safety basis document development. Upon completion of the course, the student will understand (1) the suitability of the EPIcode for modeling chemical release, spills, and dispersion; (2) major strengths and limitations of the modeling code; (3) input requirements for modeling DOE facility chemical spills/releases; and (4) how to develop associated facility safety basis documents from modeling results/outputs.

This is a 1.5-day course.

ALOHA and EPIcode Modeling Codes

NTC-SAF-766 LANL-EDS-42462 & 42460

This course integrates the materials from the EPIcode and ALOHA modeling courses into one course offering. These two modeling codes are presented together, enabling the participant to compare the suitability of their use in accident analyses in support of DOE facility safety basis document development. Upon completion of the course, the student will understand (1) the suitability of both codes for calculating chemical source terms and resulting downwind concentrations, and for modeling chemical releases, spills, and dispersion; (2) the major strengths and limitations of these modeling codes; (3) the input requirements for modeling DOE facility chemical spills/releases; and (4) how to use both modeling code outputs in support of facility safety basis documents.

This is a 3-day course.

MELCOR Modeling Code

NTC-SAF-770 LANL-EDS-44904

The MELCOR Modeling Code course is designed to provide Safety Analysts with a working-level knowledge of the MELCOR modeling code used in accident analyses in support of DOE facility safety basis document development. Upon completion of the course, the student will understand (1) the suitability of MELCOR for modeling a release of radioactive airborne material from non-reactor facilities and structures, (2) the major strengths and limitations/weaknesses of the modeling code, (3) how to determine input requirements for modeling DOE facility accidents, and (4) how to develop associated facility safety basis documents from modeling results/outputs.

This is a 4-day course.

GENII Modeling Code

NTC-SAF-776 LANL-EDS-50169

The GENII Version 2 Modeling Code course is designed to provide Safety Analysts with a working knowledge of the GENII modeling code used in accident analyses in support of DOE facility safety basis document development. Upon completion of the course, the student will (1) understand the suitability of GENII for modeling radiological dispersion and consequence analysis; (2) understand the major strengths and limitations/weaknesses of GENII; (3) be able to determine input requirements for modeling DOE facility accidents; and (4) be able to develop associated facility safety basis documents from modeling results/outputs.

This is a 2-day course.