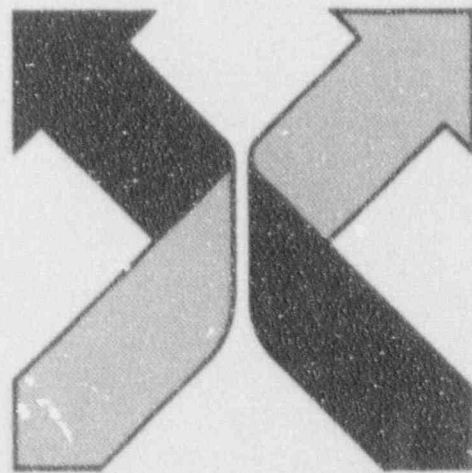


The Nuclear Regulatory Commission

Technical Training Center Syllabus of Courses



Technical Training Center
Office for Analysis and
Evaluation of Operational
Data

ADDENDUM TO
Office of Personnel
Guide to Training
Opportunities

1993—1994

Technical Training Center Syllabus of Courses

1993 – 1994

*By Kenneth A. Raglin, Director
Technical Training Center*

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Background

The NRC Technical Training Center (TTC) coordinates with the NRC headquarters offices and regions in the development and implementation of NRC staff technical qualification programs. Technical training is provided for NRC personnel, selected NRC contractors, and other Government organizations, as appropriate. Training is provided to initially teach and continually maintain NRC inspectors, operator licensing examiners, reviewers, project managers, operations officers, technical managers, and other NRC personnel with the level of knowledge of reactor technology and other specialized technical training necessary to perform assigned agency functions. Principles of the systems approach to training are routinely used throughout the life cycle of courses managed by the TTC.

The reactor technology curriculum consists of a spectrum of courses involving both classroom and simulator training covering the General Electric, Westinghouse, Combustion Engineering, and Babcock & Wilcox reactor vendor designs. Reactor technology courses are typically presented by TTC staff members. The TTC manages the operation, maintenance, and upgrade of three full scope reactor training simulators and associated computer equipment in support of established training needs. There are presently three full scope reactor training simulators located at the TTC, modeling the General Electric, Westinghouse, and Babcock & Wilcox reactor vendor designs.

The specialized technical training curriculum consists of a number of courses in engineering support, health physics, safeguards, and inspection or examination techniques. The TTC provides specialized technical training through presentation of custom developed courses by the TTC staff, presentation of customized courses by TTC contractors, coordination of slots (training opportunities) in courses that are presented by other Government agencies, and identification and promotion of appropriate commercially available courses that NRC personnel can attend as individual training opportunities using the NRC Form 368 process managed by the Office of Personnel. For many of the contracted courses, NRC perspectives are provided by specifically designated individuals from within the agency staff.

This Syllabus of Courses provides a description of each course, including course length, instructional hours, location, prerequisites for attendance, applicability. Specific training requirements for the various technical positions can be found in documents such as NRC Inspection Manual Chapter 1245, Examiner Standards, and Office Directives.

Technical
Training Center
Staff

Director	Kenneth A. Raglin
Technical Assistant	Steven A. Arndt
Sr. Project Manager	Stephen D. Roessler
Chief, Management Support Staff	Irene M. Parker
Office Automation Assistant	Sharon K. Roberson
Office Automation Assistant	Janice W. Patterson
Chief, BWR Technology Branch	Leonard J. Reidinger
Reactor Technology Instructor	Melvin E. Cashatt
Reactor Technology Instructor	Joseph O. McMillion
Reactor Technology Instructor	Bill S. Thurmond
Reactor Technology Instructor	Nathan J. Lewis
Reactor Technology Instructor	Dennis L. DuBois
Reactor Technology Instructor	Phillip R. Bennett
Reactor Technology Instructor	James A. Canady
Chief, PWR Technology Branch	Steven K. Showe
Senior Simulator Engineer	James P. Griffin
Simulator Engineer	Janice I. Griffin
Simulator Engineer	William J. Lawson
Chief, Westinghouse Section	Kathy H. Gibson
Reactor Technology Instructor	Donald T. Nelson
Reactor Technology Instructor	Bobby R. Eaton
Reactor Technology Instructor	Ralph D. Jones
Reactor Technology Instructor	Stephen S. Koscielny
Chief, CE/B&W Section	T. Larry Bell
Reactor Technology Instructor	Paul C. Gage
Reactor Technology Instructor	Fangie E. Jones III
Reactor Technology Instructor	George O. Schneider
Reactor Technology Instructor	Gerard A. Van Sickle
Reactor Technology Instructor	Loren F. Donatell
Chief, Specialized Technical Training Branch	Russell L. Anderson
Senior Health Physicist (Materials)	John L. Ricci
Technical Program Specialist	Lee R. Miller
Technical Program Specialist	Kenneth M. Jenison
Senior Health Physicist (Reactor)	To Be Determined

Training Advisory Group

The Training Advisory Group (TAG) is a group of agency managers who provide field and program office input and management feedback on training programs and resolve issues involving curricula and training requirements associated with NRC staff qualification programs. The TAG provides a forum for obtaining consensus on training priorities for programs or potential programs in competition for the same resources. Whenever necessary, the TAG convenes separate sub-committees or working groups to consider issues requiring special attention outside of regular TAG meetings. The TAG normally meets semiannually and consists of the following representatives.

Chairman (TTC)	Kenneth A. Raglin
Region I Representative	James T. Wiggins
Region II Representative	John P. Stohr
Region III Representative	William L. Forney
Region IV Representative	Samuel J. Collins
Region V Representative	Ross A. Scarano
NRR Representative	Richard H. Wessman
NMSS Representative	Malcolm R. Knapp
RES Representative	Alois J. Burda
AEOD Representative	R. Lee Spessard
OP Representative	Peter J. Goldman
SP Representative	Vandy L. Miller

Training Advisory Council

The Training Advisory Council (TAC) is a group of agency senior managers who provide field and program office senior management input for recommended changes in technical training policy; provide a forum to obtain consensus on broad training issues spanning offices and regions; and resolve issues involving curriculum and technical training requirements for technical groups which cut across several technical disciplines or across organizational lines. The TAC membership consists of the following individuals.

Denwood F. Ross (Chairman)	AEOD
Frank J. Miraglia	NRR
Guy A. Arlotto	NMSS
Clemens J. Heltemes	RES
James F. McDermott	OP
Carl J. Paperiello	Region III
John B. Martin	Region V

Facility
Information

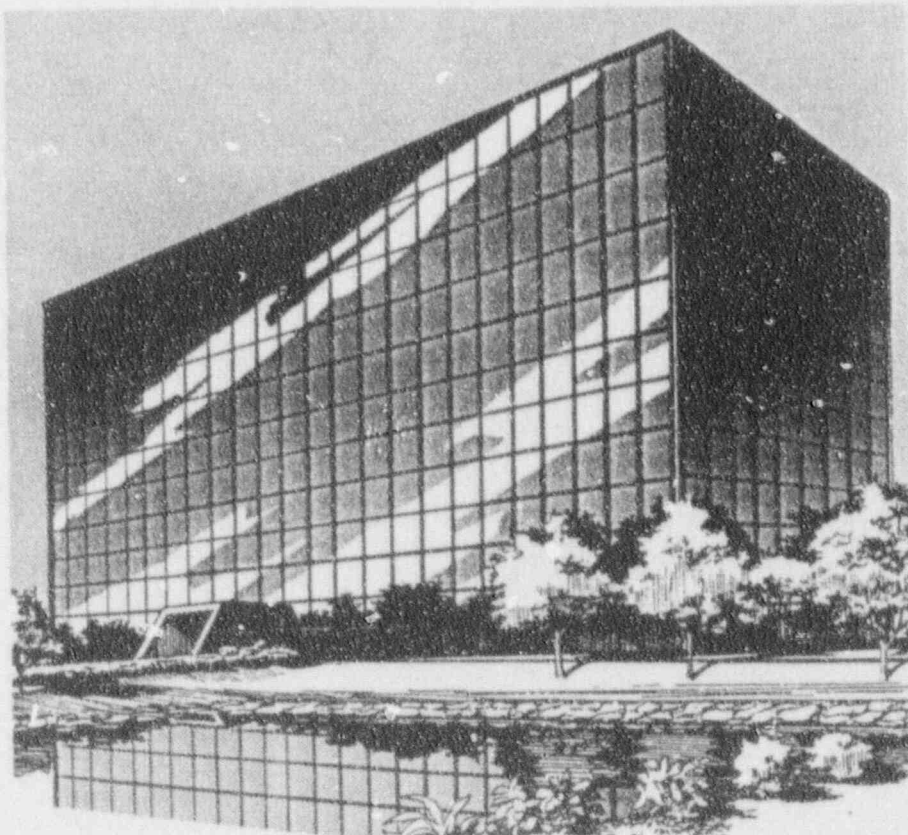
The mailing address of the Technical Training Center is as follows:

USNRC Technical Training Center
Osborne Office Center, Suite 200
5700 Brainerd Road
Chattanooga, TN 37411-4017

The TTC can be contacted by phone or facsimile at the following numbers:

(615) 855-6500	Voice
(615) 855-6543	Fax
(615) 855-6546	Fax

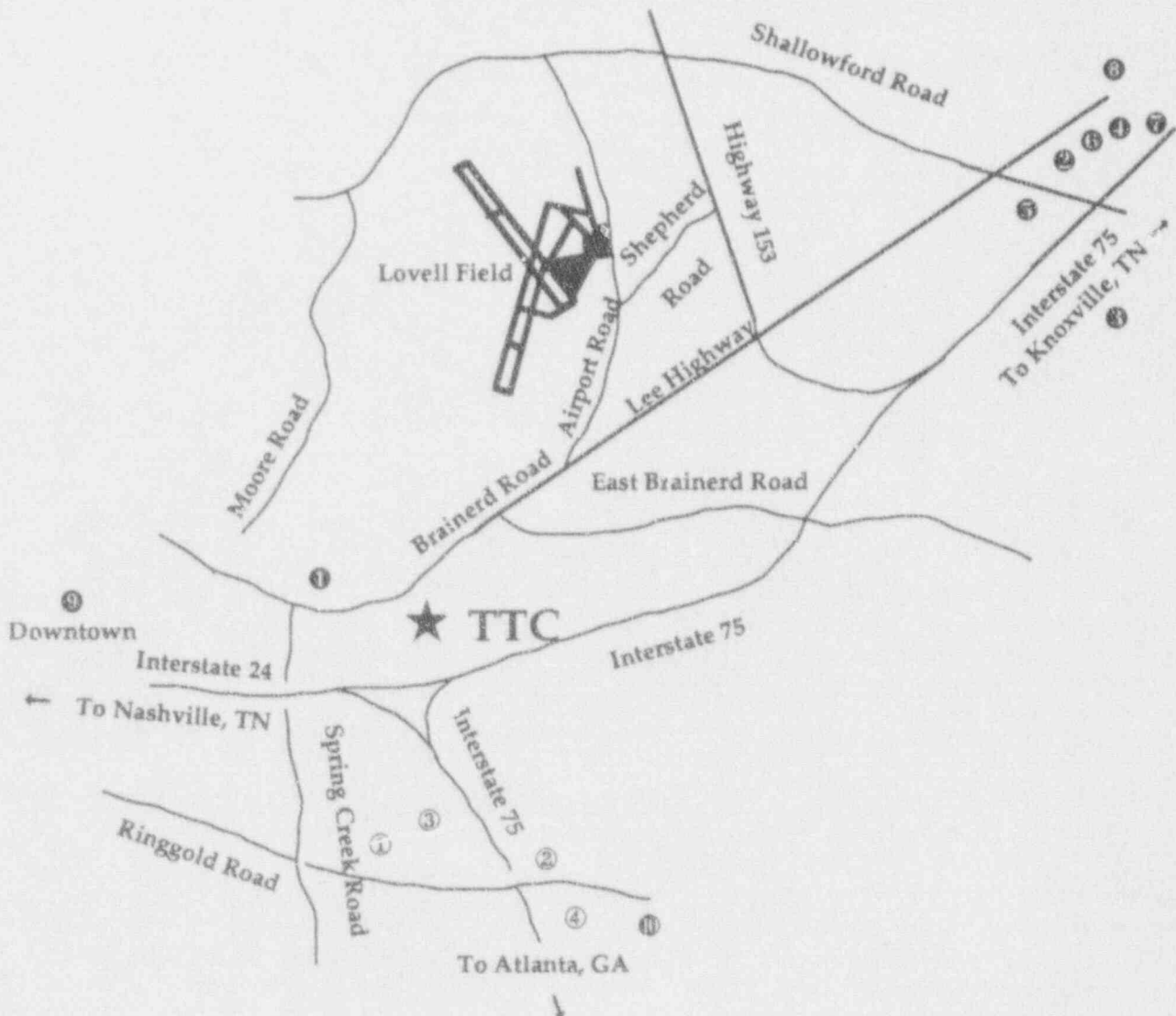
The Technical Training Center occupies all or parts of four floors of the Osborne Office Center for a total of approximately 45,000 square feet. The exterior of the TTC facility is shown below.



TTC Location

The Technical Training Center is conveniently located near the Chattanooga Airport, numerous motels, and numerous restaurants. Maps of the area in close proximity to the Technical Training Center and a list of local lodging possibilities are provided below. Maps and lists of lodging are also provided as attachments to course letters, particularly for courses not presented at the TTC.

CHATTANOOGA



Motels Near TTC

The following motels are located in the Chattanooga, Tennessee area in the vicinity of the Technical Training Center:

- ❶ Shoney's Inn
5505 Brainerd Road
(615)-894-2040
- ❷ Hampton Inn
7011 Shallowford Road
(615)-855-0095
- ❸ Comfort Suites
7324 Shallowford Road
(615)-892-1500
- ❹ Days Inn Airport
7015 Shallowford Road
(615)-855-0011
- ❺ Red Roof Inn
7014 Shallowford Road
(615)-899-0143
- ❻ Holiday Inn
2345 Shallowford Village Drive
(615)-855-2898
- ❼ Fairfield Inn
2350 Shallowford Village Drive
(615)-499-3800
- ❽ Best Western Heritage Inn
7641 Lee Highway
(615)-899-3211
- ❾ Marriott - Downtown
2 Carter Plaza
(615)-756-0002
- ❿ Best Western Motor Inn
I-75 and U.S. 41 (East Ridge Exit)
(615)-894-6820

- ① Days Inn
I-75 and U.S. 41 (East Ridge Exit)
(615)-894-7480
- ② Ramada Inn South
I-75 and U.S. 41 (East Ridge Exit)
(615)-894-6110
- ③ Quality Inn
I-75 and U.S. 41 (East Ridge Exit)
(615)-894-0440
- ④ Holiday Inn
I-75 and U.S. 41 (East Ridge Exit)
(615)-892-8100

Course Schedule

The TTC course schedule is published annually as a memorandum from the Director, TTC to all NRC employees. This memorandum gives a chronological and topical listing of the courses offered by or through the TTC. Each of the courses mentioned in this memorandum is described in this Syllabus of Courses. Changes to the TTC course schedule are made as needed to reflect course data changes, course additions, or course cancellations. Such notification will be made in memorandum form and forwarded to Training Coordinators.

Registration

Registration of students into courses conducted or coordinated by the TTC is accomplished through the Training Coordinator of the region or NRC office concerned. Training Coordinators have the responsibility of prioritizing the names of their personnel for available slots. Individual supervisors who want their personnel assigned to a given course must do so through their appropriate training coordinator. The TTC controls attendance to all courses listed in this syllabus unless indicated otherwise on the individual course description sheets. For courses identified as available through the NRC Form 368 process, the Form 368 should be submitted by the appropriate Training Coordinator to the Office of Personnel.

Slot allocations for courses that are a part of a full course series or cross training series are made for the entire series. Supervisors should realize that once an employee is registered for a course series, a commitment has been made for that employee to attend all courses in the series. Once scheduled, students should not be withdrawn from a course series except for personal emergencies. Supervisors should also recognize that once an employee is pulled from a course series, it will be difficult to get that employee into another series.

Course Letters	Approximately six weeks before a course begins, the names of students selected for attendance are announced in a standard course letter mailed to Training Coordinators. Any slots not taken will be considered open and made available to others.
Class Size	Each course conducted or contracted by the TTC has a maximum enrollment that has been chosen to give the student a quality learning experience while making optimum use of course instructors and facilities. Each course also has a minimum enrollment. If the course registration fails to reach or drops below that level, the course will normally be deferred or canceled. Once course letters have been mailed, a student's registration should not be canceled except in an emergency.
Course Manuals	Course manuals for courses managed by the TTC are indicated on the individual syllabus page associated with each course and are issued to students on the first day of each course. Course manuals are not mailed to students prior to courses. Some students, however, wish to do some pre-course study prior to arrival. To support this, the Technical Training Center has provided several copies of commonly used manuals to major NRC headquarters offices and regional offices. These manuals are typically located in the reference library or equivalent for each office and are typically controlled by Training Coordinators.
Attire	Casual business attire is appropriate for class attendance. Any special requirements will be announced in individual course letters.
Student Work Schedules	All students should be removed from compressed work schedules for the pay periods(s) during which the student will attend TTC courses. In the unlikely event that TTC courses must be scheduled over a holiday, students would be required to attend on the holiday.
Course Hours	The standard course hours for all classroom courses conducted at the TTC are 7:30 AM to 4:15 PM. Hours for other types of courses such as simulator courses depend on the availability of simulator time. Hours for contracted courses may vary based on course location and availability of special facilities. The actual course hours for all courses will be promulgated in the standard course letter to course participants.
Reaching Students During Classes	Students attending TTC courses are generally unavailable to their office during classroom hours. Students will not be called out of the class for telephone messages unless the message is dealing with a personal or family emergency. Messages will be taken for all other incoming calls and are posted on a bulletin board. Students may return calls during breaks between classroom presentation and after class has ended for the day. Calls which are

	<p>to be returned during break periods should be sufficiently short to allow students to return to the classroom before class resumes. This is necessary to ensure that each student receives the maximum benefit from the training and other students are not distracted by late arrivals.</p>
Smoking	<p>The Technical Training Center is located within the Osborne Office Building, which is a no-smoking building.</p>
Examination Policy	<p>Examinations are given at the end of most TTC courses. Students required by NRC Inspection Manual Chapter 1245 (or other formal requirement) to complete a course as part of their qualification program must pass the examination. The passing grade for all TTC courses is 70% except for Site Access Training and Site Access Refresher Training which require a score of 80%. Some employee qualification programs may require a higher passing grade for some courses.</p> <p>Examinations for TTC courses are linked to learning objectives associated with course modules. These learning objectives are provided to students at the beginning of courses and are normally included as part of the course manual. Examinations for reactor technology courses and some specialized technical training courses are normally randomly generated by a Computerized Examination Bank System which contains validated questions.</p> <p>After course examinations have been graded, course reporting letters with actual course grades will be sent to the appropriate Region or Program Office via the Training Coordinator. Students will receive a copy of this letter along with the completed examination if the examination was not previously returned. Course reporting letters for students who satisfactorily complete a course (or course series) will reflect that the minimum requirements have been met, and a training certificate will be provided. Course reporting letters for students who fail a course (or course series) will identify areas in which additional attention is needed so that the appropriate upgrading program can be planned and implemented.</p> <p>Since there is typically no pre-course examination, the final course examination grade is not necessarily indicative of the level of effort expended by the student. Examination results indicate only the knowledge level of the student at the conclusion of a course, and the numerical grade should not be used as a performance indicator.</p> <p>Examination results are normally considered final. If a question concerning the grading of an examination arises, the examination will be regraded provided the examination has been discussed with the student's management;</p>

the student's management requests the regrading of the examination in writing, to the appropriate TTC Branch Chief; and the original examination is returned to the TTC. Under no circumstances will a copy of the examination be regraded. The complete examination will be regraded by an instructor who was not associated with the original examination. Any regraded examination is considered as the final grade for the examination and will be returned to the student's management.

Equivalency examinations may be given to certain experienced personnel for the purpose of validating certain stand-alone courses or courses of the Reactor Technology Course Series. Such equivalency examinations must be requested in writing by the student's immediate supervisor in a memorandum to the Director, TTC. These requests must include detailed remarks on the individual's prior experience and/or education to allow the Director, TTC to make a decision regarding an equivalency exam.

Experience has shown that individuals rarely validate both the 300 level Technology Course and the 500 level Advanced Technology Course. Even experience as a senior reactor operator on an operating plant does not guarantee a background suitable for validating both of these courses. Additionally, students who validate courses typically miss out on many NRC perspectives that are presented during the course. The TTC recommends that even individuals with excellent backgrounds validate only the first course of a series.

Equivalency Examination Policy

Equivalency examinations, if approved by the Director, TTC, are given under certain conditions. Students validating a TTC reactor technology course may take the equivalency examination at the TTC. Requests are also considered for the equivalency examination to be given in the regional office or program office on the regular examination day for the course that is being validated. Students authorized to validate both the 300 level Technology Course and the 500 level Advanced Technology Course may do so individually or simultaneously. If the validation is to be done individually, the equivalency examination for each of the courses will be taken at the TTC (or at the employee's office if approved) on the regular examination day for each course that is being validated. If simultaneous validation is to be attempted, then a comprehensive equivalency examination will be taken at the TTC on the regular examination day for the 500 level Advanced Technology Course which is being validated.

Students validating required contractor courses may take an equivalency examination either at the TTC or in the employee's office at a time agreed upon by the student's immediate supervisor and the TTC.

**Reexamination
Policy**

Written reexaminations may be given to students who receive failing grades, subject to certain limitations. Reexaminations are rarely given to students who received a course grade of less than 50%. In this situation, the only way to get the student certified for that particular course is to have the individual repeat the course. No reexaminations are given, regardless of the grade, if the course which has been failed is not required training for the individual unless a request is received from the student's management. Only one reexamination will be given to a student for any given course. Any student who fails a reexamination must repeat the course to satisfy the training requirement.

A reexamination for a student who is not excluded by the above limitations must be requested in writing by the student's management in a memorandum or letter to the Director, TTC. Such requests must be received by the TTC within 30 working days from the date the examination letter identifying the failure was mailed to the student and immediate supervisor. A prepared reexamination will then be mailed with a cover letter signed by the Director, TTC, to the student's immediate supervisor. This letter will indicate how the reexamination should be administered. The completed reexamination must be returned to the Director, TTC, immediately upon completion.

At the time this syllabus was issued, there was a strong possibility that a BWR/4 reactor simulator would be acquired and that the majority of BWR training would be shifted to the BWR/4 base. Accordingly, BWR full course series based on both the BWR/6 and BWR/4 designs are described. The full course series for a particular reactor technology area consists of four courses which must be taken in succession. These courses are indicated below for the General Electric, Westinghouse, Combustion Engineering, and Babcock & Wilcox reactor vendor designs.

**Full Course
Series**General Electric Technology Full Course Series (BWR/6-Based)

- GE Technology Course (R-306B)
- GE Advanced Technology Course (R-506B)
- GE Simulator Course (R-606B)
- GE EOP Simulator Course (R-622B)

General Electric Technology Full Course Series (BWR/4-Based)

- GE Technology Course (R-304B)
- GE Advanced Technology Course (R-504B)
- GE Simulator Course (R-604B)
- GE EOP Simulator Course (R-621B)

Westinghouse Technology Full Course Series

- Westinghouse Technology Course (R-304P)
- Westinghouse Advanced Technology Course (R-504P)
- Westinghouse Simulator Course (R-604P)
- Westinghouse EOP Simulator Course (R-621P)

Combustion Engineering Technology Full Course Series

- CE Technology Course (R-305P)
- CE Advanced Technology Course (R-505P)
- CE Simulator Course (R-605P)
- CE EOP Simulator Course (R-622P)

Babcock & Wilcox Technology Full Course Series

- B&W Technology Course (R-306P)
- B&W Advanced Technology Course (R-506P)
- B&W Simulator Course (R-606P)
- B&W EOP Simulator Course (R-623P)

Cross Training
Series

A cross training series is available within the BWR technology curriculum and consists of a series of three courses which must be taken in succession. These courses are indicated below.

General Electric Technology Cross Training Series

- GE Technology for Cross Qualification (R-326B)
- GE Simulator Course (R-606B)
- GE EOP Simulator Course (R-622B)

Course
Prerequisites

Prerequisites are listed for each course as appropriate. Students who do not meet the prerequisites for a particular course should not be scheduled into that course.

Instructional
Hours

An Instructional Hour is a one hour period of training in which a course instructor is present or readily available for instructing or assisting students. One hour devoted to any of the following activities is considered an instructional hour under this definition: lectures, seminars, discussions, problem solving sessions, quizzes, examinations, on-the-job training, laboratory exercises, programmed learning, and simulation exercises. The appropriate value for this parameter is included on the individual sheet for each course described in this syllabus.

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GE Technology Course (R-101B)

Description:	The course provides a general familiarity with the mechanical, instrumentation and control, and protective systems of the General Electric design. The course describes the functions and flow paths of major systems, instrumentation, terminology, and equipment location. Emphasis is placed on the nuclear steam supply system including engineered safety features.	
Length:	4 Days	28 Instructional Hours
Location:	NRC Technical Training Center, Chattanooga, Tennessee and other locations as announced.	
Conducted By:	NRC Technical Training Center Staff	
Examination:	None	
Manual:	GE Technology Manual	
Prerequisites:	None. A technical background is desirable.	
Applicability:	NRC staff personnel who need to understand basic General Electric power plant design. This is also the GE Technology Course associated with the PRA Technology Transfer Program managed by the Office of Personnel.	

GE Technology Course (R-104B)

Description:	The course provides a general familiarity with the mechanical, instrumentation and control, and protective systems of the General Electric BWR/4 design. Functions and flow paths of major systems, instrumentation, terminology, and equipment location are described. Emphasis is placed on the nuclear steam supply system including the engineered safety features.	
Length:	5 Days	33 Instructional Hours
Location:	NRC Technical Training Center, Chattanooga, Tennessee	
Conducted By:	NRC Technical Training Center Staff	
Examination:	Students demonstrate attainment to the required level of knowledge by successful completion of a written examination.	
Manual:	GE Technology Manual	
Prerequisites:	None. A technical background is desirable.	
Applicability:	NRC personnel who have a need to understand basic GE power plant design. This is a required course for certain qualification programs.	

GE Technology Course (R-106B)

Description:	The course provides a general familiarity with the mechanical, instrumentation and control, and protective systems of the General Electric design. Functions and flow paths of major systems, instrumentation, terminology, and equipment location are described. Emphasis is placed on the nuclear steam supply system including the engineered safety features.	
Length:	5 Days	33 Instructional Hours
Location:	NRC Technical Training Center, Chattanooga, Tennessee	
Conducted By:	NRC Technical Training Center Staff	
Examination:	Students demonstrate attainment to the required level of knowledge by successful completion of a written examination.	
Manual:	GE Technology Manual	
Prerequisites:	None. A technical background is desirable.	
Applicability:	NRC personnel who have a need to understand basic GE power plant design. This is a required course for certain qualification programs.	

GE Technology Course (R-200B)

Description:	<p>The course consists of two weeks of classroom instruction followed by one week of simulator training. The classroom phase of the course provides a general understanding of the General Electric BWR/4 design with emphasis in system design, function, instrumentation, interlocks, and interrelationships. Presentations are at the one-line diagram level for major NSS systems and components. Additional attention is also focused on both safety and non-safety related support and auxiliary systems. The simulator phase of the course provides an introduction to integrated facility operations with emphasis on system interrelationships. Simulator training consists of instructor-led demonstrations and student participation in controlled plant scenarios.</p>	
Length:	15 Days	105 Instructional Hours
Location:	NRC Technical Training Center, Chattanooga, Tennessee	
Conducted By:	NRC Technical Training Center Staff	
Examination:	<p>Students demonstrate attainment of the required level of knowledge by successful completion of a comprehensive written examination at the end of week two. There is no examination for the simulator phase of the course.</p>	
Manual:	GE Technology Manual	
Prerequisites:	<p>Completion of the Power Plant Engineering Course (E-110) is highly recommended for reactor engineer interns and technical personnel without prior nuclear experience. A technical background is desirable for any other NRC staff members who might attend the course.</p>	
Applicability:	<p>This is a required course for development of reactor engineer and reactor health physics interns and technical personnel without prior nuclear experience and is optional for other NRC personnel who have a need to understand the areas specified in the course description.</p>	

GE Technology Course (R-304B)

Description:	The course provides a working knowledge of the General Electric (GE) BWR/4 design with emphasis in the following areas: system design, function, instrumentation, interlocks, design problems, operational problems and difficulties, PRA insights, technical specifications, and thermal limits. Presentations are at the one-line piping and instrumentation diagram level and include some detailed system design and operational aspects and references to technical specifications for major systems and components. Additional attention is also focused on both safety and non-safety related support and auxiliary systems. This course is the first in a series of four courses in GE BWR/4 Technology (R-304B, R-504B, R-604B, R-621B).	
Length:	15 Days	103 Instructional Hours
Location:	NRC Technical Training Center, Chattanooga, Tennessee	
Conducted By:	NRC Technical Training Center Staff	
Examination:	Students demonstrate attainment of the required level of knowledge by successful completion of written mid-course and final examinations.	
Manual:	GE Technology Systems Manual	
Prerequisites:	Completion of the Power Plant Engineering Course (E-110) or equivalent experience or successful completion of the GE Technology Course (either R-104B or R-200B) is highly recommended.	
Applicability:	This is a required course for certain qualification programs, including those for many reactor operations inspectors, Operator Licensing Examiners, and Headquarters Operations Officers. This is also a required course for certain other training and development programs.	

GE Technology Course (R-306B)

Description:	The course provides a working knowledge of the General Electric (GE) design with emphasis in the following areas: system design, function, instrumentation, interlocks, design problems, operational problems and difficulties, PRA insights, technical specifications, and thermal limits. Presentations are at the one-line piping and instrumentation diagram level and include some detailed system design and operational aspects and references to technical specifications for major systems and components. Additional attention is also focused on both safety and non-safety related support and auxiliary systems. This course is the first in a series of four courses in GE Technology (R-306B, R-506B, R-606B, R-621B).	
Length:	15 Days	103 Instructional Hours
Location:	NRC Technical Training Center, Chattanooga, Tennessee	
Conducted By:	NRC Technical Training Center Staff	
Examination:	Students demonstrate attainment of the required level of knowledge by successful completion of written mid-course and final examinations.	
Manual:	GE Technology Systems Manual	
Prerequisites:	Completion of the Power Plant Engineering Course (E-110) or equivalent experience or successful completion of the GE Technology Course (either R-106B or R-200B) is highly recommended.	
Applicability:	This is a required course for certain qualification programs, including those for many reactor operations inspectors, Operator Licensing Examiners, and Headquarters Operations Officers. This is also a required course for certain other training and development programs.	

GE Technology Course for Cross Qualification (R-326B)

Description:	The course provides a working knowledge of the General Electric (GE) BWR/6 design with emphasis in the following areas: system design, interrelationships, instrumentation; interlocks, design problems; power distribution and thermal hydraulic limits; integrated plant response to normal operating and transient conditions; analysis of operational and transient conditions; plant procedures and their application; abnormal events; technical specifications; and PRA insights. Presentations are at the level of the full course series technology courses (R-300, and R-500). Emphasis is placed on systems design and operations which are relevant to the GE BWR/6 design with minimal presentation of information common to all BWRs. Transient curves and data from plant events are used to illustrate facility operation during normal and transient conditions. This is the first in a series of three courses for cross qualification in GE BWR/6 Technology design (R-326B, R-606B, R-622B).	
Length:	15 Days	103 Instructional Hours
Location:	NRC Technical Training Center, Chattanooga, Tennessee	
Conducted By:	NRC Technical Training Center Staff	
Examination:	Students demonstrate attainment of the required level of knowledge by successful completion of a written examination. The examination is at the same level as the full course series technology courses (R-300 and R-500).	
Manual:	GE BWR/6 Technology Systems and Advanced Manuals	
Prerequisites:	Successful completion of the full course series in either the Westinghouse, Babcock & Wilcox, or General Electric BWR/4 technology design or equivalent experience is required.	
Applicability:	This course, in conjunction with the GE Simulator and GE EOP Simulator Courses (R-606B and R-622B) can satisfy qualification requirements for qualification in a second reactor technology area for technical positions such as Resident Inspectors, Operator Licensing Examiners, and Headquarters Operations Officers.	

GE Advanced Technology Course (R-504B)

Description:	<p>The course provides a working knowledge of the General Electric (GE) BWR/4 design with emphasis in the following areas: systems interrelationships; analysis of integrated plant response to normal operating and transient conditions; technical issues; plant procedures and their applications; facility abnormal events; PRA insights; technical specifications including limiting conditions for operation, limiting safety system settings, safety limits, and bases; and process computer usage, application and available data. Presentations include analysis of transient curves and data from actual plant events to show integrated facility operation during normal and transient conditions. Technical specifications, plant procedures, actual plant events, and technical issues are discussed. This course is the second in a series of four courses in GE BWR/4 Technology (R-304B, R-504B, R-604B, R-621B).</p>	
Length:	10 Days	68 Instructional Hours
Location:	NRC Technical Training Center, Chattanooga, Tennessee	
Conducted By:	NRC Technical Training Center Staff	
Examination:	Students demonstrate attainment of the required level of knowledge by successful completion of a written examination.	
Manual:	GE Technology Advanced Manual	
Prerequisites:	Completion of the GE Technology Course (R-304B) or equivalency examination is required.	
Applicability:	This is a required course for certain qualification programs, including those for many reactor operations inspectors, Operator Licensing Examiners, and Headquarters Operations Officers. This is also a required course for certain other training and development programs.	

GE Advanced Technology Course (R-506B)

Description:	The course provides a working knowledge of the General Electric (GE) design with emphasis in the following areas: systems interrelationships; analysis of integrated plant response to normal operating and transient conditions; technical issues; plant procedures and their applications; facility abnormal events; PRA insights; technical specifications including limiting conditions for operation, limiting safety system settings, safety limits, and bases; and process computer usage, application and available data. Presentations include analysis of transient curves and data from actual plant events to show integrated facility operation during normal and transient conditions. Technical specifications, plant procedures, actual plant events, and technical issues are discussed. This course is the second in a series of four courses in GE Technology (R-306B, R-506B, R-606B, R-621B).	
Length:	10 Days	68 Instructional Hours
Location:	NRC Technical Training Center, Chattanooga, Tennessee	
Conducted By:	NRC Technical Training Center Staff	
Examination:	Students demonstrate attainment of the required level of knowledge by successful completion of a written examination.	
Manual:	GE Technology Advanced Manual	
Prerequisites:	Completion of the GE Technology Course (R-306B) or equivalency examination is required.	
Applicability:	This is a required course for certain qualification programs, including those for many reactor operations inspectors, Operator Licensing Examiners, and Headquarters Operations Officers. This is also a required course for certain other training and development programs.	

GE Simulator Course (K-604B)

Description:	The course provides a working knowledge of the General Electric (GE) BWR/4 design and operation with emphasis in the following areas: integrated plant operations; use of control room instrumentation to evaluate normal and transient operating conditions; evaluation and application of technical specifications to control room conditions; use of plant procedures; effects of equipment malfunction and inappropriate operator actions; and PRA insights. Presentations include hands-on operation and demonstrations using a full scope control room simulator covering evolutions from plant startup to major accidents. Emphasis is placed on understanding integrated plant response, recognition of unusual plant conditions, and the interaction between the plant operations staff, plant systems, procedures and regulations rather than how to operate equipment. This course is the third in a series of four courses in GE BWR/4 Technology (R-304B, R-504B, R-604B, R-621B).	
Length:	5 Days	35 Instructional Hours
Location:	NRC Technical Training Center, Chattanooga, Tennessee	
Conducted By:	NRC Technical Training Center Staff	
Examination:	Students demonstrate attainment of the required level of knowledge by successful completion of a practical examination.	
Manual:	None	
Prerequisites:	Completion of the GE Advanced Technology Course (R-504B) or equivalency examination is required.	
Applicability:	This is a required course for certain qualification programs, including those for many reactor operations inspectors, Operator Licensing Examiners, and Headquarters Operations Officers. This is also a required course for certain other training and development programs.	

GE Simulator Course (R-606B)

Description:	<p>The course provides a working knowledge of the General Electric (GE) BWR/6 design and operation with emphasis in the following areas: integrated plant operations; use of control room instrumentation to evaluate normal and transient operating conditions; evaluation and application of technical specifications to control room conditions; use of plant procedures; effects of equipment malfunction and inappropriate operator actions; and PRA insights. Presentations include hands-on operation and demonstrations using a full scope control room simulator covering evolutions from plant startup to major accidents. Emphasis is placed on understanding integrated plant response, recognition of unusual plant conditions, and the interaction between the plant operations staff, plant systems, procedures and regulations rather than how to operate equipment. This course is the third in a series of four courses in GE BWR/6 Technology (R-306B, R-506B, R-606B, R-622B) and the second in the GE cross training series (R-326B, R-606B, R-622B).</p>	
Length:	5 Days	35 Instructional Hours
Location:	NRC Technical Training Center, Chattanooga, Tennessee	
Conducted By:	NRC Technical Training Center Staff	
Examination:	Students demonstrate attainment of the required level of knowledge by successful completion of a practical examination.	
Manual:	None	
Prerequisites:	Completion of the GE Technology Course for Cross Qualification (R-326B) or equivalency examination is required.	
Applicability:	<p>This is a required course for certain qualification programs, including those for many reactor operations inspectors, Operator Licensing Examiners, and Headquarters Operations Officers. This is also a required course for certain other training and development programs.</p>	

GE Integrated Facility Operations (IFO) Simulator Course (R-614B)

Description:	The course provides a working knowledge of the General Electric (GE) BWR/4 design and operation with emphasis on integrated plant operations; real-time normal plant operations; use of control room instrumentation in the evaluation of normal and transient operating conditions; evaluation and application of technical specifications to control room conditions; application of plant procedures; and effect of equipment malfunction or inappropriate operator actions. Presentations include hands-on operation and demonstrations using a full scope control room simulator. Operations include evolutions from plant startup and shutdown to power operations with concurrent discussions of plant procedural and technical specification requirements. Emphasis is placed on integrated plant response, real-time operations, and interaction between the plant operations staff, plant systems, procedures and regulations rather than how to operate equipment.	
Length:	5 Days	34 Instructional Hours
Location:	NRC Technical Training Center, Chattanooga, Tennessee	
Conducted By:	NRC Technical Training Center Staff	
Examination:	None	
Manual:	None	
Prerequisites:	Successful completion of the General Electric technology full course series (R-304B, R-504B, R-604B, and R-621B) is required.	
Applicability:	This is a course for Operator Licensing Examiners and is scheduled at mutually agreeable times by the Operator Licensing Branch of NRR and the Technical Training Center.	

GE Emergency Operating Procedures (EOP) Simulator Course (R-621B)

Description:	The course provides a general understanding of the BWR Owners Group Emergency Procedure Guidelines and Emergency Operating Procedures. Application of these procedures is presented using a combination of classroom and simulator training. Major topics include: EPG/EOP structure and interfacing; intent of each EPG/EOP; entry conditions and symptoms; monitoring critical plant parameters; EPG/EOP use and philosophy; EPG/EOP, operator and plant responses to various plant transients and emergency conditions; and normal and abnormal plant operations. This course is the last in a series of four courses in GE BWR/4 Technology (R-304B, R-504B, R-604B, R-621B).	
Length:	5 Days	34 Instructional Hours
Location:	NRC Technical Training Center, Chattanooga, Tennessee	
Conducted By:	NRC Technical Training Center Staff	
Examination:	None	
Manual:	General Electric EOP Manual	
Prerequisites:	Successful completion of the GE Simulator Course (R-604B) or equivalent experience is required.	
Applicability:	This is a required course for certain qualification programs, including those for many reactor operations inspectors, Operator Licensing Examiners, and Headquarters Operations Officers. This is also a required course for certain other training and development programs.	

GE Emergency Operating Procedures (EOP) Simulator Course (R-622B)

Description:	The course provides a general understanding of the BWR Owners Group Emergency Procedure Guidelines and Emergency Operating Procedures. Application of these procedures is presented using a combination of classroom and simulator training. Major topics include: EPG/EOP structure and interfacing; intent of each EPG/EOP; entry conditions and symptoms; monitoring critical plant parameters; EPG/EOP use and philosophy; EPG/EOP, operator and plant responses to various plant transients and emergency conditions; and normal and abnormal plant operations. This course is the fourth in a series of four courses in GE BWR/6 Technology (R-306B, R-506B, R-606B, R-622B) and the third in the GE cross training series (R-326B, R-606B, R-622B).	
Length:	5 Days	34 Instructional Hours
Location:	NRC Technical Training Center, Chattanooga, Tennessee	
Conducted By:	NRC Technical Training Center Staff	
Examination:	None	
Manual:	General Electric EOP Manual	
Prerequisites:	Successful completion of the GE Simulator Course (R-606B) or equivalent experience is required.	
Applicability:	This is a required course for certain qualification programs, including those for many reactor operations inspectors, Operator Licensing Examiners, and Headquarters Operations Officers. This is also a required course for certain other training and development programs.	

GE Simulator Refresher Course for Examiners (R-701B)

Description:	The course strengthens examiner skills in simulator examination administration, familiarizes examiners with the capabilities of simulators as testing devices, and refreshes examiner knowledge of the General Electric design and operation. Emphasis is in the following areas: simulator capabilities; scenario development; scenario use (role playing); examiner techniques; hands-on operation; operational feedback (LERs, design changes, etc.). Presentations include hands-on operation and demonstrations using a full scope control room simulator. The course emphasizes examination techniques including scenario development, role playing and candidate evaluations.	
Length:	5 Days	34 Instructional Hours
Location:	NRC Technical Training Center, Chattanooga, Tennessee	
Conducted By:	NRC Technical Training Center Staff	
Examination:	None	
Manual:	None	
Prerequisites:	Certification as an Operator Licensing Examiner and a minimum of one year's experience are required.	
Applicability:	This is required refresher training for Operator Licensing Examiners.	

GE Simulator Refresher Course (R-704B)

Description:	<p>The course maintains a working knowledge of the General Electric BWR/4 design and operation with emphasis in the following areas: use of control room instrumentation to evaluate normal and transient operating conditions; evaluation of system and plant conditions; evaluation and application of technical specifications to control room conditions; application of plant procedures; effect upon plant operation of equipment malfunctions or inappropriate operator action; integrated plant operations; and design, function and flow paths of major mechanical and instrumentation systems. Presentations include hands-on operation and demonstrations using a full scope control room simulator, including evolutions from plant startup to major accidents. Emphasis is placed on integrated plant response, recognition of unusual plant conditions and interaction between the plant operations staff, plant systems, procedures and regulations rather than how to operate equipment.</p>	
Length:	5 Days	35 Instructional Hours
Location:	NRC Technical Training Center, Chattanooga, Tennessee	
Conducted By:	NRC Technical Training Center Staff	
Examination:	<p>Students demonstrate maintenance of the required level of knowledge by successful completion of a written examination covering mechanical systems, instrumentation and control systems, and technical specifications and successful completion of a practical examination.</p>	
Manual:	None	
Prerequisites:	<p>Successful completion of a General Electric technology full course series (R-304B, R-504B, R-604B, R-621B). Note that the General Electric EOP Simulator Course (R-621B) was not part of the full course series prior to 1991.</p>	
Applicability:	<p>This course is required refresher training for many reactor operations inspectors.</p>	

GE Simulator Refresher Course (R-706B)

Description:	<p>The course maintains a working knowledge of the General Electric BWR/6 design and operation with emphasis in the following areas: use of control room instrumentation to evaluate normal and transient operating conditions; evaluation of system and plant conditions; evaluation and application of technical specifications to control room conditions; application of plant procedures; effect upon plant operation of equipment malfunctions or inappropriate operator action; integrated plant operations; and design, function and flow paths of major mechanical and instrumentation systems. Presentations include hands-on operation and demonstrations using a full scope control room simulator, including evolutions from plant startup to major accidents. Emphasis is placed on integrated plant response, recognition of unusual plant conditions and interaction between the plant operations staff, plant systems, procedures and regulations rather than how to operate equipment.</p>	
Length:	5 Days	35 Instructional Hours
Location:	NRC Technical Training Center, Chattanooga, Tennessee	
Conducted By:	NRC Technical Training Center Staff	
Examination:	<p>Students demonstrate maintenance of the required level of knowledge by successful completion of a written examination covering mechanical systems, instrumentation and control systems, and technical specifications and successful completion of a practical examination.</p>	
Manual:	None	
Prerequisites:	<p>Successful completion of a BWR full course series prior to August 1993 or successful completion of the General Electric BWR/6 technology cross training course series (R-326B, R-606B, R-622B).</p>	
Applicability:	<p>This course is required refresher training for many reactor operations inspectors.</p>	

GE Nuclear Engineering Course (R-801B)

Description:	The course provides a working knowledge of the following General Electric design nuclear engineering concepts: basis for core thermal limits; process computer programs; control rod pattern and sequence development; principles of core design; core management; fuel design and performance; a preconditioning interim Operating Management Recommendations (PCIOMR). Presentations cover areas of concern to a BWR Station Nuclear Engineer. Emphasis is placed on relationships to technical specifications and licensing activities where applicable.	
Length:	10 Days	70 Instructional Hours
Location:	NRC Technical Training Center, Chattanooga, Tennessee	
Conducted By:	Contractor Personnel or NRC Staff	
Examination:	Students demonstrate attainment of the required level of knowledge by successful completion of two weekly written examinations.	
Manual:	GE Staff Nuclear Engineering Manual	
Prerequisites:	Successful completion of a GE full course series (R-306B, R-506B, R-606B, R-621B). Note that the General Electric EOP Simulator Course (R-621B) was not part of the full course series prior to 1991.	
Applicability:	This course is supplemental training for NRC personnel who need to understand the aspects of GE nuclear engineering concepts.	

GE Maintenance Training Overview Course (R-802B)

Description:	The course provides an overview of the General Electric design refueling floor activities and maintenance activities for reactor internals; fuel movement; control rod drives; under vessel control rod drive components; main steam isolation valves, and recirculation pump seals. Presentations include both classroom discussions and hands-on training on actual equipment.	
Length:	5 Days	34 Instructional Hours
Location:	GE BWR Services Training Facility, San Jose, California	
Conducted By:	General Electric Company Personnel	
Exclusions:	None	
Manual:	None	
Prerequisites:	Successful completion of a GE technology full course series (R-304B, R-504B, R-604B, R-621B), GE technology cross qualification course series (R-326B, R-606B, R-622B) or equivalent experience.	
Applicability:	This course is supplemental training for NRC personnel who need to understand the aspects of refueling floor and maintenance activities.	

GE Technical Managers Course (R-904B)

Description:	The course assists NRC technical managers in maintaining a general familiarity with the General Electric BWR/4 design and operations with emphasis in the following areas; plant operational characteristics; conduct of control room operations; instrumentation and plant data available in the control room; application of abnormal and emergency procedures; plant response to abnormal and emergency conditions; effect upon plant operation of equipment malfunction or incorrect or untimely operator actions; electrical distribution systems design and operation; and PRA insights. Presentations include both classroom discussions and a simulator demonstration using a full scope control room simulator. Classroom discussions are keyed to the evolutions to be demonstrated on the simulator. Emphasis is placed on identification of abnormal or accident conditions, determination of plant status, and discussion of proper immediate and subsequent operator actions for a given plant condition.	
Length:	5 Days	35 Instructional Hours
Location:	NRC Technical Training Center, Chattanooga, Tennessee	
Conducted By:	NRC Technical Training Center Staff	
Examination:	None	
Manual:	GE Technical Managers Manual	
Prerequisites:	Although there are no prerequisites for attendance, attendees should have a general familiarity with General Electric systems.	
Applicability:	This is a course for NRC technical managers who need to attain or refresh a general familiarity with the General Electric design.	

GE Technical Managers Course (R-906B)

Description:	The course assists NRC technical managers in maintaining a general familiarity with the General Electric BWR/6 design and operations with emphasis in the following areas; plant operational characteristic; conduct of control room operations; instrumentation and plant data available in the control room; application of abnormal and emergency procedures; plant response to abnormal and emergency conditions; effect upon plant operation of equipment malfunction or incorrect or untimely operator actions; electrical distribution systems design operation; and PRA insights. Presentations include both classroom discussions and a simulator demonstration using a full scope control room simulator. Classroom discussions are keyed to the evolutions to be demonstrated on the simulator. Emphasis is placed on identification of abnormal or accident conditions, determination of plant status, and discussion of proper immediate and subsequent operator actions for a given plant condition.	
Length:	5 Days	35 Instructional Hours
Location:	NRC Technical Training Center, Chattanooga, Tennessee	
Conducted By:	NRC Technical Training Center Staff	
Examination:	None	
Manual:	GE Technical Managers Manual	
Prerequisites:	Although there are no prerequisites for attendance, attendees should have a general familiarity with General Electric systems.	
Applicability:	This is a course for NRC technical managers who need to attain or refresh a general familiarity with the General Electric design.	

Westinghouse Technology Course (R-101P)

Description:	The course provides a general familiarity with the mechanical, instrumentation and control, and protective systems of the Westinghouse design. Functions and flow paths of major systems, instrumentation, terminology, and equipment location are described. Emphasis is placed upon the nuclear steam supply system including the engineered safety features.	
Length:	4 Days	28 Instructional Hours
Location:	NRC Technical Training Center, Chattanooga, Tennessee and other locations as announced.	
Conducted By:	NRC Technical Training Center Staff	
Examination:	None	
Manual:	Westinghouse Technology Manual	
Prerequisites:	None. A technical background is desirable.	
Applicability:	NRC staff personnel who need to understand basic Westinghouse power plant design. This is also the Westinghouse Technology Course associated with the PRA Technology Transfer Program managed by the Office of Personnel.	

Westinghouse Technology Course (R-104P)

Description:	The course provides a general familiarity with the mechanical, instrumentation and control, and protective systems of the Westinghouse design. Functions and flow paths of major systems, instrumentation, terminology, and equipment location are described. Emphasis is placed upon the nuclear steam supply system including the engineered safety features.	
Length:	5 Days	33 Instructional Hours
Location:	NRC Technical Training Center, Chattanooga, Tennessee	
Conducted By:	NRC Technical Training Center Staff	
Examination:	Students demonstrate attainment of the required level of knowledge by successful completion of a written examination.	
Manual:	Westinghouse Technology Manual	
Prerequisites:	None. A technical background is desirable.	
Applicability:	NRC personnel who have a need to understand basic Westinghouse power plant design. This is a required course for certain qualification programs.	

Westinghouse Technology Course (R-200P)

Description:	<p>The course consists of two weeks of classroom instruction followed by one week of simulator training. The classroom phase of the course provides a general understanding of the Westinghouse design with emphasis in system design, function, instrumentation, interlocks, and interrelationships. Presentations are at the one-line diagram level for major NSS systems and components. Additional attention is also focused on both safety and non-safety related support and auxiliary systems. The simulator phase of the course provides an introduction to integrated facility operations with emphasis on system interrelationships. Simulator training consists of instructor-led demonstrations and student participation in controlled plant scenarios.</p>	
Length:	15 Days	105 Instructional Hours
Location:	NRC Technical Training Center, Chattanooga, Tennessee	
Conducted By:	NRC Technical Training Center Staff	
Examination:	<p>Students demonstrate attainment of the required level of knowledge by successful completion of a comprehensive written examination at the end of week two. There is no examination for the simulator phase of the course.</p>	
Manual:	Westinghouse Technology Manual	
Prerequisites:	<p>Completion of the Power Plant Engineering Course (E-110) is highly recommended for reactor engineer interns and technical personnel without prior nuclear experience. A technical background is desirable for any other NRC staff members who might attend the course.</p>	
Applicability:	<p>This is a required course for development of reactor engineer and reactor health physics interns and technical personnel without prior nuclear experience and is optional for other NRC personnel who have a need to understand the areas specified in the course description.</p>	

Westinghouse Technology Course (R-304P)

Description:	The course provides a working knowledge of the Westinghouse design with emphasis in the following areas: system design, function, instrumentation, interlocks, design problems, operational problems and difficulties, technical specifications, power distribution and thermal hydraulic limits, and PRA insights. Presentations are at the one-line piping and instrumentation diagram level and include some detailed system design and operational aspects and references to technical specifications for major systems and components. Additional attention is also focused on both safety and non-safety related support and auxiliary systems. This course is the first in a series of four courses in Westinghouse Technology (R-304P, R-504P, R-604P, R-621P).	
Length:	15 Days	103 Instructional Hours
Location:	NRC Technical Training Center, Chattanooga, Tennessee	
Conducted By:	NRC Technical Training Center Staff	
Examination:	Students demonstrate attainment of the required level of knowledge by successful completion of written mid-course and final examinations.	
Manual:	Westinghouse Technology Systems Manual	
Prerequisites:	Completion of the Power Plant Engineering Course (E-110) or equivalent experience or successful completion of the Westinghouse Technology Course (either R-104P or R-200P) is highly recommended.	
Applicability:	This is a required course for certain qualification programs, including those for many reactor operations inspectors, Operator Licensing Examiners, and Headquarters Operations Officers. This is also a required course for certain other training and development programs.	

Westinghouse Advanced Technology Course (R-504P)

Description:	The course provides a working knowledge of the Westinghouse design with emphasis in the following areas: systems interrelationships; analysis of integrated plant response to normal operating and transient conditions; analysis of technical issues; plant procedures and their applications; facility abnormal events; technical specifications (including limiting conditions for operation, limiting safety system settings, safety limits, and bases); and PRA insights. Presentations include analysis of transient curves and data from actual plant events to show integrated facility operation during normal and transient conditions. Technical specifications, abnormal, emergency, and other procedures are discussed during selected transient discussions using examples from operating plants. This course is the second in a series of four courses in Westinghouse Technology (R-304P, R-504P, R-604P, R-621P).	
Length:	10 Days	68 Instructional Hours
Location:	NRC Technical Training Center, Chattanooga, Tennessee	
Conducted By:	NRC Technical Training Center Staff	
Examination:	Students demonstrate attainment of the required level of knowledge by successful completion of a written examination.	
Manual:	Westinghouse Technology Advanced Manual	
Prerequisites:	Completion of the Westinghouse Technology Course (R-304P) or equivalency examination is required.	
Applicability:	This is a required course for certain qualification programs, including those for many reactor operations inspectors, Operator Licensing Examiners, and Headquarters Operations Officers. This is also a required course for certain other training and development programs.	

Westinghouse Simulator Course (R-604P)

Description:	The course provides a working knowledge of Westinghouse design and operation with emphasis in the following areas: integrated plant operations; use of control room instrumentation to evaluate normal and transient operating conditions; evaluation and application of technical specifications to control room conditions; use of plant procedures; effects of equipment malfunction and inappropriate operator actions; and PRA insights. Presentations include hands-on operation and demonstrations using a full scope control room simulator covering evolutions from plant startup to major accidents. Emphasis is placed on understanding integrated plant response, recognition of unusual plant conditions, and the interaction between the plant operations staff, plant systems, procedures and regulations rather than how to operate equipment. This course is the third in a series of four courses in Westinghouse Technology (R-304P, R-504P, R-604P, R-621P).	
Length:	5 Days	35 Instructional Hours
Location:	NRC Technical Training Center, Chattanooga, Tennessee	
Conducted By:	NRC Technical Training Center Staff	
Examination:	Students demonstrate attainment of the required level of knowledge by successful completion of a practical application examination.	
Manual:	None	
Prerequisites:	Completion of the Westinghouse Advanced Course (R-504P) or equivalency examination is required.	
Applicability:	This is a required course for certain qualification programs, including those for many reactor operations inspectors, Operator Licensing Examiners, and Headquarters Operations Officers. This is also a required course for certain other training and development programs.	

Westinghouse Integrated Facility Operations (IFO) Simulator Course (R-614P)

Description:	<p>The course provides a working knowledge of the Westinghouse design and operation with emphasis in integrated plant operations; real-time normal plant operations; use of control room instrumentation in the evaluation of normal and transient operating conditions; evaluation and application of technical specifications to control room conditions; application of plant procedures; and effect of equipment malfunction or inappropriate operator actions. Presentations include hands-on operation and demonstrations using a full scope control room simulator. Operations include evolutions from plant heatup and cooldown to power operations with concurrent discussions of plant procedural and technical specification requirements. Emphasis is placed on integrated plant response, real-time operations, and the interaction between the plant operations staff, plant systems, procedures and regulations rather than how to operate equipment.</p>	
Length:	5 Days	34 Instructional Hours
Location:	NRC Technical Training Center, Chattanooga, Tennessee	
Conducted By:	NRC Technical Training Center Staff	
Examination:	None	
Manual:	None	
Prerequisites:	Successful completion of the Westinghouse technology full course series (R-304P, R-504P, R-604P, R-621P) is required.	
Applicability:	This is a course for Operator Licensing Examiners and is scheduled at mutually agreeable times by the Operator Licensing Branch of NRR and the Technical Training Center.	

Westinghouse Emergency Operating Procedures (EOP) Simulator Course (R-621P)

Description:	The course provides a general understanding of the Westinghouse Owners Group Emergency Procedure Guidelines and Emergency Operating Procedures. Application of these procedures is presented using a combination of classroom and simulator training. Major topics include: EPG/EOP structure and interfacing; intent of each EPG/EOP; entry conditions and symptoms; monitoring critical plant parameters; EPG/EOP use and philosophy; EPG/EOP, operator and plant responses to various plant transients and emergency conditions; and normal and abnormal plant operations. This course is the last in a series of four courses in Westinghouse Technology (R-304P, R-504P, R-604P, R-621P).	
Length:	5 Days	34 Instructional Hours
Location:	NRC Technical Training Center, Chattanooga, Tennessee	
Conducted By:	NRC Technical Training Staff	
Examination:	None	
Manual:	Westinghouse Technology EOP Manual	
Prerequisites:	Successful completion of the Westinghouse Simulator Course (R-604P) or equivalent experience is required.	
Applicability:	This is a required course for certain qualification programs, including those for many reactor operations inspectors, Operator Licensing Examiners, and Headquarters Operation Officers. This is also a required course for certain other training and development programs.	

Westinghouse Simulator Refresher Course for Examiners (R-701P)

Description:	The course strengthens examiner skills in simulator examination administration, familiarizes examiners with the capabilities of simulators as testing devices, and refreshes examiner knowledge of Westinghouse design and operation. Emphasis is in the following areas: simulator capabilities; scenario development; scenario use (role playing); examiner techniques; hands-on operation; and operational feedback (LERs, design changes, etc.). Presentations include hands-on operation and demonstrations using a full scope control room simulator. The course emphasizes examination techniques including scenario development, role playing and candidate evaluations.	
Length:	5 Days	34 Instructional Hours
Location:	NRC Technical Training Center, Chattanooga, Tennessee	
Conducted By:	NRC Technical Training Center Staff	
Examination:	None	
Manual:	None	
Prerequisites:	Certification as an Operator Licensing Examiner and a minimum of one year's experience are required.	
Applicability:	This is required refresher training for Operator Licensing Examiners.	

Westinghouse Simulator Refresher Course (R-704P)

Description:	The course maintains a working knowledge of Westinghouse design and operation with emphasis in the following areas: use of control room instrumentation to evaluate normal and transient operating conditions; evaluation of system and plant conditions; evaluation and application of technical specifications to control room conditions; application of plant procedures; effect upon plant operation of equipment malfunctions or inappropriate operator action; integrated plant operations; and design, function and flow paths of major mechanical and instrumentation systems. Presentations include hands-on operation and demonstrations using a full scope control room simulator, including evolutions from plant startup to major accidents. Emphasis is placed on integrated plant response, recognition of unusual plant conditions and interaction between the plant operations staff, plant systems, procedures and regulations rather than how to operate equipment.	
Length:	5 Days	35 Instructional Hours
Location:	NRC Technical Training Center, Chattanooga, Tennessee	
Conducted By:	NRC Technical Training Center Staff	
Examination:	Students demonstrate maintenance of the required level of knowledge by successful completion of a written examination covering mechanical systems, instrumentation and control systems, and technical specifications and successful completion of a practical examination.	
Manual:	None	
Prerequisites:	Successful completion of a Westinghouse technology full course series (R-304P, R-504P, R-604P, R-621P). Note that the Westinghouse EOP Simulator Course (R-621P) was not part of the full course series prior to 1991.	
Applicability:	This course is required refresher training for many reactor operations inspectors.	

Westinghouse Technical Managers Course (R-904P)

Description:	The course assists NRC technical managers in maintaining a general familiarity with the Westinghouse design and operations with emphasis in the following areas; plant operational characteristics; conduct of control room operations; instrumentation and plant data available in the control room; application of abnormal and emergency procedures; plant response to abnormal and emergency conditions; effect upon plant operation of equipment malfunction or incorrect or untimely operator actions; electrical distribution systems design and operation; and PPA insights. Presentations include both classroom discussions and a simulator demonstration using a full scope control room simulator. Classroom discussions are keyed to the evolutions to be demonstrated on the simulator. Emphasis is placed on identification of abnormal or accident conditions, determination of plant status, and discussion of proper immediate and subsequent operator actions for a given plant condition.	
Length:	5 Days	35 Instructional Hours
Location:	NRC Technical Training Center, Chattanooga, Tennessee	
Conducted By:	NRC Technical Training Center Staff	
Examination:	None	
Manual:	Westinghouse Technology Technical Managers Manual	
Prerequisites:	Although there are no prerequisites for attendance, attendees should have a general familiarity with Westinghouse systems.	
Applicability:	This is a course for NRC technical managers who need to attain or refresh a general familiarity with the Westinghouse design.	

CE Technology Course (R-305F)

Description:	The course provides a working knowledge of the Combustion Engineering (CE) design with emphasis in the following areas: system design, function, instrumentation, interlocks, design problems, operational problems and difficulties, technical specifications, power distribution and thermal-hydraulic limits, and PRA insights. Presentations are at the one-line piping and instrumentation diagram level and include some detailed system design and operational aspects and references to technical specifications for major systems and components. Additional attention is also focused on both safety and non-safety related support and auxiliary systems. This course is the first in a series of four courses in CE Technology (R-305P, R-505P, R-605P, R-622P).	
Length:	15 Days	103 Instructional Hours
Location:	NRC Technical Training Center, Chattanooga, Tennessee	
Conducted By:	NRC Technical Training Center Staff	
Examination:	Students demonstrate attainment of the required level of knowledge by successful completion of written mid-course and final written examinations.	
Manual:	Combustion Engineering Technology Systems Manual	
Prerequisites:	Completion of the Power Plant Engineering Course (E-110) or equivalent experience or successful completion of the Westinghouse Technology Course (either R-104P or R-200P) is highly recommended.	
Applicability:	This is a required course for certain qualification programs, including those for many reactor operations inspectors, Operator Licensing Examiners, and Headquarters Operations Officers. This is also a required course for certain other training and development programs.	

CE Advanced Technology Course (R-505P)

Description:	The course provides a working knowledge of the Combustion Engineering (CE) design with emphasis in the following areas: systems interrelationships; analysis of integrated plant response to normal operating and transient conditions; analysis of technical issues; plant procedures and their applications; facility abnormal events; technical specifications (including limiting conditions for operation, limiting safety system settings, safety limits, and bases); and PRA insights. Presentations include analysis of transient curves and data from actual plant events to show integrated facility operation during normal and transient conditions. Technical specifications, abnormal, emergency, and other procedures are discussed during selected transient discussions using examples from operating plants. This course is the second in a series of four courses in CE Technology (R-305P, R-505P, R-605P, R-622P).	
Length:	10 Days	68 Instructional Hours
Location:	NRC Technical Training Center, Chattanooga, Tennessee	
Conducted By:	NRC Technical Training Center Staff	
Examination:	Students demonstrate attainment of the required level of knowledge by successful completion of a written examination.	
Manual:	Combustion Engineering Technology Advanced Manual	
Prerequisites:	Completion of the Combustion Engineering Technology Course (R-305P) or equivalency examination is required.	
Applicability:	This is a required course for certain qualification programs, including those for many reactor operations inspectors, Operator Licensing Examiners, and Headquarters Operations Officers. This is also a required course for certain other training and development programs.	

CE Simulator Course (R-605P)

Description:	The course provides a working knowledge of Combustion Engineering (CE) design and operation with emphasis in the following areas: integrated plant operations; use of control room instrumentation to evaluate normal and transient operating conditions; evaluation and application of technical specifications to control room conditions; use of plant procedures; effects of equipment malfunction and inappropriate operator actions; and PRA insights. Presentations include hands-on operation and demonstrations using a full scope control room simulator covering evolutions from plant startup to major accidents. Emphasis is placed on understanding integrated plant response, recognition of unusual plant conditions, and the interaction between the plant operations staff, plant systems, procedures and regulations rather than how to operate equipment. This course is the third in a series of four courses in CE Technology (R-305P, R-505P, R-605P, R-622P).	
Length:	5 Days	35 Instructional Hours
Location:	NRC Technical Training Center, Chattanooga, Tennessee	
Conducted By:	NRC Technical Training Center Staff	
Examination:	Students demonstrate attainment of the required level of knowledge by successful completion of a practical examination.	
Manual:	None	
Prerequisites:	Completion of the Combustion Engineering Advanced Course (R-505P) or equivalency examination is required.	
Applicability:	This is a required course for certain qualification programs, including those for many reactor operations inspectors, Operator Licensing Examiners, and Headquarters Operations Officers. This is also a required course for certain other training and development programs.	

CE Integrated Facility Operations (IFO) Simulator Course (R-615P)

Description:	The course provides a working knowledge of the Combustion Engineering (CE) design and operation with emphasis in integrated plant operations; real-time normal plant operations; use of control room instrumentation in the evaluation of normal and transient operating conditions; evaluation and application of technical specifications to control room conditions; application of plant procedures; and effect of equipment malfunction or inappropriate operator actions. Presentations include hands-on operation and demonstrations using a full scope control room simulator. Operations include evolutions from plant heatup and cooldown to power operations with concurrent discussions of plant procedural and technical specification requirements. Emphasis is placed on integrated plant response, real-time operations, and the interaction between the plant operations staff, plant systems, procedures and regulations rather than how to operate equipment.	
Length:	5 Days	34 Instructional Hours
Location:	NRC Technical Training Center, Chattanooga, Tennessee	
Conducted By:	NRC Technical Training Center Staff	
Examination:	None	
Manual:	None	
Prerequisites:	Successful completion of the Combustion Engineering technology full course series (R-305P, R-505P, R-605P, R-622P) is required.	
Applicability:	This is a course for Operator Licensing Examiners and is scheduled at mutually agreeable times by the Operator Licensing Branch of NRR and the Technical Training Center.	

CE Emergency Operating Procedures (EOP) Simulator Course (R-622P)

Description:	The course provides a general understanding of the Combustion Engineering Owners Group Emergency Procedure Guidelines and Emergency Operating Procedures. Application of these procedures is presented using a combination of classroom and simulator training. Major topics include: EPG/EOP structure and interfacing; intent of each EPG/EOP; entry conditions and symptoms; monitoring critical plant parameters; EPG/EOP use and philosophy; EPG/EOP, operator and plant responses to various plant transients and emergency conditions; and normal and abnormal plant operations. This course is the last in a series of four courses in CE Technology (R-305P, R-505P, R-605P, R-622P).	
Length:	5 Days	34 Instructional Hours
Location:	NRC Technical Training Center, Chattanooga, Tennessee	
Conducted By:	NRC Technical Training Center Staff	
Examination:	None	
Manual:	Combustion Engineering EOP Manual	
Prerequisites:	Successful completion of the Combustion Engineering Simulator Course (R-605P) or equivalent experience is required.	
Applicability:	This is a required course for certain qualification programs, including those for many reactor operations inspectors, Operator Licensing Examiners, and Headquarters Operations Officers. This is also a required course for certain other training and development programs.	

CE Simulator Refresher Course for Examiners (R-702P)

Description:	The course strengthens examiner skills in simulator examination administration, familiarizes examiners with the capabilities of simulators as testing devices, and refreshes examiner knowledge of Combustion Engineering design and operation. Emphasis is in the following areas: simulator capabilities; scenario development; scenario use (role playing); examiner techniques; hands-on operation; and operational feedback (LERs, design changes, etc.). Presentations include hands-on operation and demonstrations using a full scope control room simulator. The course emphasizes examination techniques including scenario development, role playing and candidate evaluations.	
Length:	5 Days	34 Instructional Hours
Location:	NRC Technical Training Center, Chattanooga, Tennessee	
Conducted By:	NRC Technical Training Center Staff	
Examination:	None	
Manual:	None	
Prerequisites:	Certification as an Operator Licensing Examiner and a minimum of one year's experience are required.	
Applicability:	This is required refresher training for Operator Licensing Examiners.	

CE Simulator Refresher Course (R-705P)

Description:	<p>The course maintains a working knowledge of Combustion Engineering design and operation with emphasis in the following areas: use of control room instrumentation to evaluate normal and transient operating conditions; evaluation of system and plant conditions; evaluation and application of technical specifications to control room conditions; application of plant procedures; effect upon plant operation of equipment malfunctions or inappropriate operator action; integrated plant operations; and design, function and flow paths of major mechanical and instrumentation systems. Presentations include hands-on operation and demonstrations using a full scope control room simulator, including evolutions from plant startup to major accidents. Emphasis is placed on integrated plant response, recognition of unusual plant conditions and interaction between the plant operations staff, plant systems, procedures and regulations rather than how to operate equipment.</p>	
Length:	5 Days	35 Instructional Hours
Location:	NRC Technical Training Center, Chattanooga, Tennessee	
Conducted By:	NRC Technical Training Center Staff	
Examination:	<p>Students demonstrate maintenance of the required level of knowledge by successful completion of a written examination covering mechanical systems, instrumentation and control systems, and technical specifications and successful completion of a practical examination.</p>	
Manual:	None	
Prerequisites:	<p>Successful completion of a Combustion Engineering technology full course series (R-305P, R-505P, R-605P, R-622P) or the previously offered Combustion Engineering technology cross training series (R-325P, R605P, R-622P). Note that the Combustion Engineering EOP Simulator Course (R-622P) was not part of the full course series prior to 1991.</p>	
Applicability:	<p>This course is required refresher training for many reactor operations inspectors.</p>	

CE Technical Managers Course (R-905P)

Description:	The course assists NRC technical managers in maintaining a general familiarity with the Combustion Engineering design and operations with emphasis in the following areas; plant operational characteristics; conduct of control room operations; instrumentation and plant data available in the control room; application of abnormal and emergency procedures; plant response to abnormal and emergency conditions; effect upon plant operation of equipment malfunction or incorrect or untimely operator actions; electrical distribution systems design and operation; and PRA insights. Presentations include both classroom discussions and a simulator demonstration using a full scope control room simulator. Classroom discussions are keyed to the evolutions to be demonstrated on the simulator. Emphasis is placed on identification of abnormal or accident conditions, determination of plant status, and discussion of proper immediate and subsequent operator actions for a given plant condition.	
Length:	5 Days	35 Instructional Hours
Location:	NRC Technical Training Center, Chattanooga, Tennessee	
Conducted By:	NRC Technical Training Center Staff	
Examination:	None	
Manual:	Combustion Engineering Technology Technical Managers Manual	
Prerequisites:	Although there are no prerequisites for attendance, attendees should have a general familiarity with Combustion Engineering systems.	
Applicability:	This is a course for NRC technical managers who need to attain or refresh a general familiarity with the Combustion Engineering design.	

B&W Technology Course (R-306P)

Description:	The course provides a working knowledge of the Babcock & Wilcox (B&W) design with emphasis in the following areas: system design, function, instrumentation, interlocks, design problems, operational problems and difficulties, technical specifications, power distribution and thermal-hydraulic limits, and PRA insights. Presentations are at the one-line piping and instrumentation diagram level and include some detailed system design and operational aspects and references to technical specifications for major systems and components. Additional attention is also focused on both safety and non-safety related support and auxiliary systems. This course is the first in a series of four courses in B&W Technology (R-306P, R-506P, R-606P, R-623P).	
Length:	15 Days	103 Instructional Hours
Location:	NRC Technical Training Center, Chattanooga, Tennessee	
Conducted By:	NRC Technical Training Center Staff	
Examination:	Students demonstrate attainment of the required level of knowledge by successful completion of written mid-course and final examinations.	
Manual:	Babcock & Wilcox Technology Systems Manual	
Prerequisites:	Completion of the Power Plant Engineering Course (E-110) or equivalent experience or successful completion of the Westinghouse Technology Course (either R-104P or R-200P) is highly recommended.	
Applicability:	This is a required course for certain qualification programs, including those for many reactor operations inspectors, Operator Licensing Examiners, and Headquarters Operations Officers. This is also a required course for certain other training and development programs.	

B&W Advanced Technology Course (R-506P)

Description:	The course provides a working knowledge of the Babcock & Wilcox (B&W) design with emphasis in the following areas: systems interrelationships; analysis of integrated plant response to normal operating and transient conditions; analysis of technical issues; plant procedures and their applications; facility abnormal events; technical specifications (including limiting conditions for operation, limiting safety system settings, safety limits, and bases); and PRA insights. Presentations include analysis of transient curves and data from actual plant events to show integrated facility operation during normal and transient conditions. Technical specifications, abnormal, emergency, and other procedures are discussed during selected transient discussions using examples from operating plants. This course is the second in a series of four courses in B&W Technology (R-306P, R-506P, R-606P, R-623P).	
Length:	10 Days	68 Instructional Hours
Location:	NRC Technical Training Center, Chattanooga, Tennessee	
Conducted By:	NRC Technical Training Center Staff	
Examination:	Students demonstrate attainment of the required level of knowledge by successful completion of a written examination.	
Manual:	Babcock & Wilcox Technology Advanced Manual	
Prerequisites:	Successful completion of the Babcock & Wilcox Technology Course (R-306P) or equivalency examination is required.	
Applicability:	This is a required course for certain qualification programs, including those for many reactor operations inspectors, Operator Licensing Examiners, and Headquarters Operations Officers. This is also a required course for certain other training and development programs.	

B&W Simulator Course (R-606P)

Description:	The course provides a working knowledge of Babcock & Wilcox (B&W) design and operation with emphasis in the following areas: integrated plant operations; use of control room instrumentation to evaluate normal and transient operating conditions; evaluation and application of technical specifications to control room conditions; use of plant procedures; effects of equipment malfunction and inappropriate operator actions; and PRA insights. Presentations include hands-on operation and demonstrations using a full scope control room simulator covering evolutions from plant startup to major accidents. Emphasis is placed on understanding integrated plant response, recognition of unusual plant conditions, and the interaction between the plant operations staff, plant systems, procedures and regulations rather than how to operate equipment. This course is the third in a series of four courses in B&W Technology (R-306P, R-506P, R-606P, R-623P).	
Length:	5 Days	35 Instructional Hours
Location:	NRC Technical Training Center, Chattanooga, Tennessee	
Conducted By:	NRC Technical Training Center Staff	
Examination:	Students demonstrate attainment of the required level of knowledge by successful completion of a practical examination.	
Manual:	None	
Prerequisites:	Completion of the Babcock & Wilcox Advanced Course (R-506P) or equivalency examination is required.	
Applicability:	This is a required course for certain qualification programs, including those for many reactor operations inspectors, Operator Licensing Examiners, and Headquarters Operations Officers. This is also a required course for certain other training and development programs.	

B&W Integrated Facility Operations (IFO) Simulator Course (R-616P)

Description:	The course provides a working knowledge of the Babcock & Wilcox (B&W) design and operation with emphasis in integrated plant operations; real-time normal plant operations; use of control room instrumentation in the evaluation of normal and transient operating conditions; evaluation and application of technical specifications to control room conditions; application of plant procedures; and effect of equipment malfunction or inappropriate operator actions. Presentations include hands-on operation and demonstrations using a full scope control room simulator. Operations include evolutions from plant heatup and cooldown to power operations with concurrent discussions of plant procedural and technical specification requirements. Emphasis is placed on integrated plant response, real-time operations, and the interaction between the plant operations staff, plant systems, procedures and regulations rather than how to operate equipment.	
Length:	5 Days	34 Instructional Hours
Location:	NRC Technical Training Center, Chattanooga, Tennessee	
Conducted By:	NRC Technical Training Center Staff	
Examination:	None	
Manual:	None	
Prerequisites:	Successful completion of the Babcock & Wilcox technology full course series (R-306P, R-506P, R-606P, R-623P) is required.	
Applicability:	This is a course for Operator Licensing Examiners and is scheduled at mutually agreeable times by the Operator Licensing Branch of NRR and the Technical Training Center.	

B&W Emergency Operating Procedures (EOP) Simulator Course (R-623P)

Description:	The course provides a general understanding of the Babcock & Wilcox Owners Group Emergency Procedure Guidelines and Emergency Operating Procedures. Application of these procedures is presented using a combination of classroom and simulator training. Major topics include: EPG/EOP structure and interfacing; intent of each EPG/EOP; entry conditions and symptoms; monitoring critical plant parameters; EPG/EOP use and philosophy; EPG/EOP, operator and plant responses to various plant transients and emergency conditions; and normal and abnormal plant operations. This course is the last in a series of four courses in B&W Technology (R-306P, R-506P, R-606P, R-623P).	
Length:	5 Days	34 Instructional Hours
Location:	NRC Technical Training Center, Chattanooga, Tennessee	
Conducted By:	NRC Technical Training Center Staff	
Examination:	None	
Manual:	Babcock & Wilcox EOP Manual	
Prerequisites:	Successful completion of the Babcock & Wilcox Simulator Course (R-606P) or equivalent experience is required.	
Applicability:	This is a required course for certain qualification programs, including those for many reactor operations inspectors, Operator Licensing Examiners, and Headquarters Operations Officers. This is also a required course for certain other training and development programs.	

B&W Simulator Refresher Course for Examiners (R-703P)

Description:	The course strengthens examiner skills in simulator examination administration, familiarizes examiners with the capabilities of simulators as testing devices, and refreshes examiner knowledge of Babcock & Wilcox design and operation. Emphasis is in the following areas: simulator capabilities; scenario development; scenario use (role playing); examiner techniques; hands-on operation; and operational feedback (LERs, design changes, etc.). Presentations include hands-on operation and demonstrations using a full scope control room simulator. The course emphasizes examination techniques including scenario development, role playing and candidate evaluations.	
Length:	5 Days	34 Instructional Hours
Location:	NRC Technical Training Center, Chattanooga, Tennessee	
Conducted E	NRC Technical Training Center Staff	
Examination:	None	
Manual:	None	
Prerequisites:	Certification as an Operator Licensing Examiner and a minimum of one year's experience are required.	
Applicability:	This is required refresher training for Operator Licensing Examiners.	

B&W Simulator Refresher Course (R-706P)

Description:	The course maintains a working knowledge of Babcock & Wilcox design and operation with emphasis in the following areas: use of control room instrumentation to evaluate normal and transient operating conditions; evaluation of system and plant conditions; evaluation and application of technical specifications to control room conditions; application of plant procedures; effect upon plant operation of equipment malfunctions or inappropriate operator action; integrated plant operations; and design, function and flow paths of major mechanical and instrumentation systems. Presentations include hands-on operation and demonstrations using a full scope control room simulator, including evolutions from plant startup to major accidents. Emphasis is placed on integrated plant response, recognition of unusual plant conditions and interaction between the plant operations staff, plant systems, procedures and regulations rather than how to operate equipment.	
Length:	5 Days	35 Instructional Hours
Location:	NRC Technical Training Center, Chattanooga, Tennessee	
Conducted By:	NRC Technical Training Center Staff	
Examination:	Students demonstrate maintenance of the required level of knowledge by successful completion of a written examination covering mechanical systems, instrumentation and control systems, and technical specifications and successful completion of a practical examination.	
Manual:	None	
Prerequisites:	Successful completion of a Babcock & Wilcox technology full course series (R-306P, R-506P, R-606P, R-623P) or the previously offered Babcock & Wilcox technology cross training series (R-326P, R606P, R-623P). Note that the Babcock & Wilcox EOP Simulator Course (R-623P) was not part of the full course series prior to 1991.	
Applicability:	This course is required refresher training for many reactor operations inspectors.	

B&W Technical Managers Course (R-906P)

Description:	The course assists NRC technical managers in maintaining a general familiarity with the Babcock & Wilcox design and operations with emphasis in the following areas; plant operational characteristics; conduct of control room operations; instrumentation and plant data available in the control room; application of abnormal and emergency procedures; plant response to abnormal and emergency conditions; effect upon plant operation of equipment malfunction or incorrect or untimely operator actions; electrical distribution systems design and operation; and PRA insights. Presentations include both classroom discussions and a simulator demonstration using a full scope control room simulator. Classroom discussions are keyed to the evolutions to be demonstrated on the simulator. Emphasis is placed on identification of abnormal or accident conditions, determination of plant status, and discussion of proper immediate and subsequent operator actions for a given plant condition..	
Length:	5 Days	35 Instructional Hours
Location:	NRC Technical Training Center, Chattanooga, Tennessee	
Conducted By:	NRC Technical Training Center Staff	
Examination:	None	
Manual:	Babcock & Wilcox Technology Technical Managers Manual	
Prerequisites:	Although there are no prerequisites for attendance, attendees should have a general familiarity with Babcock & Wilcox systems.	
Applicability:	This is a course for NRC technical managers who need to attain or refresh a general familiarity with the Babcock & Wilcox design.	

Reactor Concepts Course (R-100)

Description:	The course provides a basic introduction to the following concepts: nuclear power and electrical generation; the fission process and heat generation; boiling water reactor systems overview; pressurized water reactor systems overview; radiation and biological effects; radioactive waste; nuclear materials transportation; refueling operations; and emergency action levels.	
Length:	2 Days	14 Instructional Hours
Location:	NRC Headquarters and Regional Offices	
Conducted By:	NRC Technical Training Center Staff	
Examination:	None	
Manual:	Reactor Concepts Manual	
Prerequisites:	None	
Applicability:	This course is supplemental training for the NRC staff and is provided in support of the NRC Orientation Program managed by the Office of Personnel. It is widely attended by non-technical personnel and others with a need to obtain the nuclear power overview provided by the course.	

National News Media Seminar (R-102)

Description:	The course provides a basic introduction to the following concepts: nuclear power and electrical generation; the fission process and heat generation; boiling water reactor systems overview; pressurized water reactor systems overview; reactor emergencies, radiation and biological effects; radioactive waste; nuclear materials transportation; boiling water reactor simulator operations; and pressurized water reactor operations. In addition to classroom presentations, the course is supplemented with demonstrations of nuclear plant operations, transients, and accidents using full scope reactor training simulators.	
Length:	2 Days	14 Instructional Hours
Location:	NRC Technical Training Center, Chattanooga, Tennessee	
Conducted By:	Technical Training Center Staff and Headquarters or Regional Public Affairs Officer	
Examination:	None	
Manual:	Reactor Concepts Manual	
Prerequisites:	None	
Applicability:	This course is provided in support of the NRC public affairs function managed by the Office of Governmental and Public Affairs. It is attended by newspaper, radio, television, and magazine personnel from across the nation.	

Reactor Safety Course (R-800)

Description:	The course provides a broad perspective of important reactor safety concepts with emphasis on topics important to reactor risk. Five Major areas are covered. (1) Historical Overview which includes: design for safety; defense in depth strategy; ECCS rulemaking; and severe accident and safety goal policy. (2) Accident Sequences which includes: safety risk concepts and terminology; accident sequence development; important accident sequences; and IPE and IPEEE programs. (3) Accident Progression in the Reactor Vessel which includes: fission product inventory and decay heat; and core melt progression. (4) Accident Progression in the Containment which includes: containment phenomena; reactor cavity and vessel breach phenomena; and hydrogen and combustion events. (5) Radiological Releases and Consequences which includes: radionuclide groupings; environmental transport; EPA protective action guidelines; and emergency response. In addition discussions focus on plant events such as Chernobyl; accident management principles; and historical perspectives.	
Length:	5 Days	35 Instructional Hours
Location:	NRC Technical Training Center, Chattanooga, Tennessee	
Conducted By:	Sandia National Laboratory Personnel and Selected NRC Staff	
Examination:	None	
Manual:	Reactor Safety Course Manual	
Prerequisites:	Completion of a full course series in General Electric, Westinghouse, Combustion Engineering, or Babcock & Wilcox reactor vendor designs or equivalent experience is highly recommended.	
Applicability:	This is a required course for development of reactor engineer interns, newly hired technical personnel without prior nuclear experience, and newly hired technical personnel with prior nuclear experience. The course is supplemental training for other NRC personnel who have a need to understand the areas specified in the course description.	

Power Plant Engineering Course (E-110)

Description:	The course provides an understanding of the practical aspects of nuclear power plant operation. Emphasis is placed on the use and operation of various types of equipment rather than design. When topics such as physics, chemistry and heat transfer are discussed, their relationship to basic reactor operation and the nuclear plant cycle are stressed. Course topics include: basic plant cycles, reactor physics, heat transfer and thermal hydraulics, process chemistry, print reading, basic electrical, generators, AC motors, electrical distribution equipment, piping, turbines, diesel generators, process instrumentation, controllers, nuclear instrumentation and radiation protection.	
Length:	15 Days	102 Instructional Hours
Location:	NRC Technical Training Center, Chattanooga, Tennessee	
Conducted By:	Sonalysts, Inc.	
Examination:	Students demonstrate attainment of the required level of knowledge by successful completion of three written examinations.	
Manual:	Power Plant Engineering Manual	
Prerequisites:	None. A technical background is desirable.	
Applicability:	This is a required course for development of reactor engineer and reactor health physics interns and technical personnel without prior nuclear experience and is optional for other NRC personnel who have a need to understand the areas specified in the course description.	

Emergency Diesel Generators Course (E-111)

Description:	The course provides technical information pertaining to the operation and maintenance of emergency diesel generators with emphasis on diesel generator purposes and typical technical specifications; construction and nomenclature; general operating principles; typical component arrangements; auxiliary and control systems; and maintenance and troubleshooting.	
Length:	5 Days	32 Instructional Hours
Location:	Norristown, PA	
Conducted By:	SAIC/AMSEC	
Examination:	None	
Manual:	Emergency Diesel Generators Manual	
Prerequisites:	None. A technical background is desirable.	
Applicability:	This course is supplemental training for NRC personnel who have a need to understand basic diesel generator design and operation.	

Motorized Valve Actuators Course (E-112)

Description:	The course provides technical information and hands-on experience pertaining to the operation and maintenance of motorized valve actuators with emphasis on parts, functions, design and functional differences; maintenance; troubleshooting; electrical circuits, performance testing and failure histories.	
Length:	5 Days	32 Instructional Hours
Location:	Lynchburg, VA	
Conducted By:	PowerSafety International	
Examination:	None	
* Manual:	Motorized Valve Actuator Manual	
Prerequisites:	None. A technical background is desirable.	
Applicability:	This course is supplemental training for NRC personnel who have a need to understand basic motorized valve operator design and operation.	

Fire Protection for Power Plants Course (E-113)

Description:	The course provides a basic understanding of the concepts, hardware and functions of fire protection as they apply to the electric power generating industry. Course topics include: basic fire principles; chemistry and physics of fire; fire detection systems; suppression systems; passive fire protection; life safety; fire emergency planning; industrial hazards; power plant fire hazards and protection covering turbines and generators, electrical equipment, and auxiliaries; grouped electrical cables; coal-fired power plants; oil-fired power plants; hydro-electric power plants; combustion turbines; nuclear power plant fire protection covering NRC requirements, Appendix R requirements and exemptions, technical specifications, quality assurance, and plant specific hazards for pressurized water and boiling water reactors.	
Length:	4 Days	32 Instructional Hours
Location:	Knoxville, Tennessee	
Conducted By:	Professional Loss Control (PLC), Inc.	
Examination:	None	
Manual:	Fire Protection for Power Plants Manual	
Prerequisites:	None. NRC Form 368 must be submitted to OP/EOS 30 to 60 days in advance of the course start date. Course information is provided by the Technical Training Center. Attendance is controlled by Professional Loss Control.	
Applicability:	This course is supplemental training for NRC personnel involved with fire protection-related inspection activities.	

Groundwater Modeling Course (E-114)

Description:	The courses cover various aspects of groundwater modeling including the occurrence and movement of groundwater, physical properties, equations of flow, aquifer test procedures, design and construction of monitoring wells, solute transport in the saturated zone, water quality characterization, and contaminant transport.	
Length:	3 or 5 Days	21 or 35 Instructional Hours
Location:	Various Locations	
Conducted By:	National Water Well Association or International Ground Water Modeling Center	
Examination:	None	
Manual:	Groundwater Modeling Manual	
Prerequisites:	NRC Form 368 must be submitted to OP/EOS 30 - 60 days in advance of course start date. Course information is provided by the Technical Training Center. Attendance is controlled by the firm conducting the training.	
Applicability:	These courses are recommended for NMSS Low Level Waste Management (Technical Branch) and High Level Waste Management (Geosciences and Systems Performance Branch) personnel.	

Systems Engineering Management Course (E-115)

Description:	The course covers the systems engineering management plan, trade-off studies, design reviews and audits, technical performance measurements, specification tailoring, configuration management, work breakdown structures, and risk identification and management. Also discussed are the manner in which life cycle cost/affordability, readiness/supportability, reliability, testability, producibility, capability, and other characteristics of a system. The scheduling and conduct of reviews of progress, as well as controlling technical risk levels, are also covered.	
Length:	5 Days	35 Instructional Hours
Location:	Fort Belvoir, Virginia	
Conducted By:	Defense Systems Management College	
Examination:	None	
Manual:	Systems Engineering Management Manual	
Prerequisites:	None. Course information is provided by the Technical Training Center.	
Applicability:	This course is recommended for NMSS High Level Waste Management, Repository Licensing and Quality Assurance Project Directorate personnel.	

Welding Technology and Codes Course (E-303)

Description:	The course provides a working knowledge of metallurgy and welding technology as applicable to welding fabrication and construction at nuclear power facilities; codes and standards of special interest in welding inspection; and technical evaluations of licensee and licensee contractor performance.	
Length:	10 Days	67 Instructional Hours
Location:	To Be Determined	
Conducted By:	To Be Determined	
Examination:	Students demonstrate attainment of the required level of knowledge by successful completion of course exercises and examinations.	
Manual:	Welding Technology and Codes Manual	
Prerequisites:	None	
Applicability:	This course is required initial training for Reactor Construction Resident Inspectors and is supplemental training for other NRC personnel working with welding technology and code applications.	

Nondestructive Examination (NDE) Technology and Codes Course (E-306)

Description:	The course provides a working knowledge of ultrasonic, radiographic, liquid penetrant, and magnetic particle testing; technical evaluations of licensee and licensee contractor performance in these areas; and the codes and standards of special interest in NDE inspection activities.	
Length:	10 Days	67 Instructional Hours
Location:	Niantic, Connecticut	
Conducted By:	Sonalysts/Hellier & Associates	
Examination:	Students demonstrate attainment of the required level of knowledge by successful completion of quizzes and a comprehensive written examination.	
Manual:	NDE Technology and Codes Manual	
Prerequisites:	None	
Applicability:	This course is required initial training for Reactor Construction Resident Inspectors and is supplemental training for other NRC personnel working with nondestructive examination and code applications.	

Eddy Current Testing Course (E-307)

Description:	The course provides a working knowledge of eddy current testing with particular emphasis on nuclear power plant applications. Course topics include eddy current methodology, equipment operation, detection of damage; applications including steam generator, in-core thimble tube, control rod and balance of plant component inspections; data analysis tools; steam generator design review and damage mechanisms; codes and standards of special interest in eddy current inspections; and technical evaluation of licensee and licensee contractor performance.	
Length:	5 Days	32 Instructional Hours
Location:	Niantic, Connecticut	
Conducted By:	Sonalysts/Hellier & Associates	
Examination:	Students demonstrate attainment of the required level of knowledge by successful completion of a written examination.	
Manual:	Eddy Current Testing Manual	
Prerequisites:	None. Completion of the Nondestructive Examination Technology and Codes Course (E-306) or similar experience is recommended.	
Applicability:	This course is supplemental training for resident and region-based inspectors and other personnel working with eddy current testing and code applications. This course is offered only with sufficient demand. The Technical Training Center separately announces the scheduling of this course.	

Inservice Inspection Course (E-308)

Description:	Requirements of ASME Section XI for inservice inspection of nuclear power plant components are presented, covering pre-service and inservice inspection of Class 1, 2, 3 nuclear vessels, piping, pumps, valves and component supports. Course topics include the following: overview and application of the ASME Code; code cases; interpretations, errata, and applicable Federal and State laws; general requirements of Section XI; jurisdiction; owner's responsibilities; NDE procedures; inspection intervals; records; comparison of Class 1, 2, and 3 systems including NDE; pressure test and repair rules; repair and replacement programs; specialized examination equipment for inspection of reactor vessels, steam generators and reactor coolant pumps; component supports and their impact on ISI programs; development and control principles for inservice inspection programs; and NRC and ASME source documents which impact inservice inspection programs.	
Length:	3 Days	21 Instructional Hours
Location:	As announced	
Conducted By:	Technical Seminars, Inc.	
Examination:	None	
Manual:	Inservice Inspection Manual	
Prerequisites:	None. Completion of the Nondestructive Examination Technology and Codes Course (E-306) or similar experience is recommended. NRC Form 368 must be submitted to OP/EOS 30 to 60 days in advance of the course start date. Course information is provided by the Technical Training Center. Attendance is controlled by Technical Seminars, Inc.	
Applicability:	This course is supplemental training for resident and region-based inspectors and other personnel working with inservice inspection applications.	

Site Access Training Course (H-100)

Description:	The course provides a general understanding of radiation types, quantities, units, biological effects, protection standards and guides, postings, exposure control, ALARA practices, monitoring instruments and dosimeters, bioassay, and contamination protection. It also provides a generic understanding of industrial safety practices, physical protection programs and responses to radiological emergencies. The course also includes an exercise in which each student will be expected to don protective clothing, perform simple tasks and remove protective clothing.	
Length:	2 Days	14 Instructional Hours
Location:	Bethesda, Maryland and NRC Regional Offices	
Conducted By:	General Physics Corporation	
Examination:	Students demonstrate attainment of the required level of understanding by successful completion of a protective clothing exercise and written examination.	
Manual:	Site Access Training Manual	
Prerequisites:	Reactor Concepts Course (R-100) or equivalent technical expertise is necessary. The Technical Training Center controls attendance at headquarters courses.	
Applicability:	This course, or equivalent Nuclear General Employee Training at a licensee facility, is required for NRC personnel who require unescorted access into licensee radiation/contamination areas in the performance of their duties.	

Site Access Refresher Training Course (H-101)

Description:	The course updates and refreshes the generic understanding of radiation types, quantities, units, biological effects, protection standards and guides, postings, exposure control, ALARA practices, monitoring instruments and dosimeters, bioassay, contamination protection, industrial safety practices, physical protection programs, and responses to radiological emergencies.	
Length:	1 Day	7 Instructional Hours
Location:	Bethesda, Maryland or Regional Offices	
Conducted By:	General Physics Corporation	
Examination:	Students demonstrate attainment of the required level of understanding by successful completion of a written examination.	
Manual:	Site Access Training Manual	
Prerequisites:	Site Access Training Course (H-100) or equivalent Nuclear General Employee Training at a licensee facility is necessary. The Technical Training Center controls attendance at headquarters courses.	
Applicability:	This is a required annual refresher training course for NRC employees who need unescorted access into licensee radiation/contamination areas in the performance of their duties. This requirement may also be satisfied by completion of a computer-based-training (CBT) course available at NRC Headquarters and regional offices. Individuals who do not successfully complete the CBT examination in two attempts must take the lecture course.	

NMSS Radiation Worker Training (H-102)

Description:	The course provides a general understanding of radiation safety including radiation types quantities and units, biological effects, protection standards, postings, sources of exposure, exposure control, dosimetry and bioassay and an introduction to industrial safety.	
Length:	.5 Day	4 Instructional Hours
Location:	OWFN, Rockville, MD	
Conducted By:	General Physics Corporation	
Examination:	Students demonstrate attainment of the required level of understanding by successful completion of a written examination.	
Manual:	NMSS Radiation Worker Training Manual	
Prerequisites:	None	
Applicability:	NMSS or other NRC personnel who may be occupationally exposed.	

In-Place Filter Testing Course (H-105)

Description:	The course provides an in-depth understanding of the nature of airborne hazards, air filtration and absorption theory, aerosol technology, air-flow measurement, in-place testing of HEPA filters, and safety cabinets.	
Length:	5 Days	34 Instructional Hours
Location:	Boston, Massachusetts	
Conducted By:	Harvard School of Public Health	
Examination:	None	
Manual:	In-Place Filter Testing Manual	
Prerequisites:	NRC Form 368 must be submitted to OP/EOS 30 to 60 days in advance of the course start date. Course information is provided by the Technical Training Center. Attendance is controlled by the Harvard School of Public Health.	
Applicability:	This course is supplemental training for NRC personnel involved in airborne hazard protection.	

OSHA Orientation Course (H-107)

Description:	The course provides familiarity with the Memorandum of Understanding between the NRC and OSHA and the basic safety and health hazards associated with workplaces frequented by NRC inspectors. Course topics include an introduction to OSHA standards and hazardous materials, specific hazards associated with electrical sources, flammable liquids, compressed gases, cryogenic fluids, ammonia, hydrogen, oxygen, material handling, welding machine guarding, and walking/working surfaces. Emphasis is also given to laboratory safety, fire protection, means of egress and toxic and hazardous substances. A special session is devoted to non-radiological hazards associated with fuel cycle operations.	
Length:	3 Days	18 Instructional Hours
Location:	Various	
Conducted By:	OSHA Training Institute Staff	
Examination:	None	
Manual:	OSHA Manual	
Prerequisites:	None. This course is provided by the OSHA Training Institute as a special service to the NRC, and course scheduling is highly dependent on the availability of OSHA Training Institute resources. The NRC must guarantee a minimum of 25 students in order to schedule this course. As a result, this course may not be offered annually.	
Applicability:	This course is required for Materials and Fuel Facility Specialist Inspectors.	

Fuel Cycle Technology Course (H-108)

Description:	The course provides familiarity with the nuclear fuel cycle from mining to fabrication. Course topics include uranium, its occurrence in nature, and chemical, physical, radiological properties; mining and extraction methods and the milling process; conversion of natural uranium trioxide to uranium hexafluoride; uranium enrichment including the history of uranium enrichment; the purpose and uses of enriched uranium; separative work and enrichment processes; and uranium fuel fabrication including uranium hexafluoride to uranium dioxide powder; powder to pellets; pellets to rods and assemblies, and scrap recovery.	
Length:	5 Days	35 Instructional Hours
Location:	NRC Technical Training Center, Chattanooga, Tennessee	
Conducted By:	IT Corporation and Guest Lecturers	
Examination:	Students demonstrate attainment of the required level of understanding by successful completion of a written examination.	
Manual:	Fuel Cycle Technology Manual	
Prerequisites:	None	
Applicability:	This course is supplemental training for regional and headquarters inspector personnel and other NRC personnel who have a requirement to license, inspect, or otherwise regulate any aspect of the nuclear fuel cycle.	

Applied Health Physics Course (H-109)

Description:	The course provides an intensive laboratory oriented radiation protection training program consisting of lectures, tours, workshops and laboratory exercises to provide an understanding of atomic and nuclear physics, radiation biology, radiation detection principles, monitoring methods and equipment calibration, external and internal dosimetry, uses of radiation and radiation protection, radionuclide pathways and environmental monitoring and radiation protection in emergencies.	
Length:	25 Days	172 Instructional Hours
Location:	Oak Ridge, Tennessee	
Conducted By:	Oak Ridge Institute for Science and Education	
Examination:	Student progress is monitored by weekly quizzes.	
Manual:	ORISE Applied Health Physics Manual	
Prerequisites:	A background in one of the physical sciences or engineering disciplines is necessary. The Technical Training Center coordinates attendance and provides funding for this course. A hand-held calculator with exponential and logarithmic functions is recommended.	
Applicability:	This is a required course for development of reactor and nuclear materials health physics interns who do not have a health physics degree and is supplemental training for other NRC personnel who require an understanding of the concepts and applications described above.	

Environmental Monitoring for Radioactivity Course (H-111)

Description:	The course covers the basic theories and mechanics of environmental monitoring for radioactivity; techniques for air monitoring; soil, water, vegetation, sediment, and food sampling; direct gamma measurements; borehole logging; and environmental sampling regulations. Approximately 50% of the course is devoted to collection and analyses of samples	
Length:	5 Days	35 Instructional Hours
Location:	Oak Ridge, Tennessee	
Conducted By:	Oak Ridge Institute for Science and Education	
Examination:	None	
Manual:	Environmental Monitoring Manual	
Prerequisites:	None. NRC Form 368 must be submitted to OP/EOS 30 to 60 days in advance of the course start date. Course information is provided by the Technical Training Center.	
Applicability:	This course is recommended for NMSS Low Level Waste Management, Technical and Regulatory Branch personnel.	

Applied Gamma Spectroscopy Course (H-112)

Description:	The course covers the basics of nuclear theory, gamma ray detection systems and methods, energy and efficiency calibration, resolution and peak shape, computer algorithms, and statistics.	
Length:	5 Days	35 Instructional Hours
Location:	Various	
Conducted By:	Quantum Technology, Inc., Technical Management Services, Inc. or Oak Ridge Institute for Science and Education	
Examination:	None	
Manual:	Applied Gamma Spectroscopy Manual	
Prerequisites:	NRC Form 368 must be submitted to OP/EOS 30 - 60 days in advance of course start date. Course information is provided by the Technical Training Center. Attendance is controlled by the firm conducting the training: Quantum Technology, Inc., Technical Management Services, Inc. or ORISE.	
Applicability:	This course is recommended for NMSS Safeguards and Transportation Division, International Safeguards Branch personnel.	

Intermediate Gamma Spectroscopy Course (H-113)

Description:	The course covers the concepts of gamma spectroscopy using germanium detectors including basic decay principles, gamma interactions with matter, detector interactions, signal chain components, spectrum characteristics, calibration, nuclide identification, and application software review.	
Length:	5 Days	35 Instructional Hours
Location:	Meriden, Connecticut	
Conducted By:	Canberra Industries, Inc.	
Examination:	None	
Manual:	Intermediate Gamma Spectroscopy Manual	
Prerequisites:	None. NRC Form 368 must be submitted to OP/EOS 30 to 60 days in advance of the course start date. Course information is provided by the Technical Training Center. Attendance is controlled by Canberra Industries, Inc.	
Applicability:	This course is recommended for NMSS Safeguards and Transportation Division, International Safeguards Branch personnel.	

10 CFR Part 20 Seminar (H-114)

Description:	The seminar provides a working understanding of the revised 10 CFR Part 20. Seminar topics include a comparison of the old and new Rules with emphasis on examples and significant changes and specialized roundtable discussions for Reactor Health Physics Inspectors and Materials Health Physics Inspectors.	
Length:	2 Days	14 Instructional Hours
Location:	NRC Technical Training Center, Chattanooga, Tennessee and other locations as announced.	
Conducted By:	NRC Technical Training Center, NRR, NMSS, S ⁹ and RES staff.	
Examination:	None.	
Manual:	10 CFR Part 20 Training Manual	
Prerequisites:	Prior familiarity with the revised 10 CFR Part 20 and completion of self-study quizzes is recommended.	
Applicability:	This course is intended for health physics inspectors and other personnel who require a detailed understanding of the revised 10 CFR Part 20.	

Skin Dosimetry Workshop (H-115)

Description:	This workshop provides an understanding of the dose to the skin with emphasis on beta dosimetry. Instruction includes detection and measurement principles of beta dosimetry, skin radiobiology, airborne beta radiation dose to the skin and eye and skin dose and proximate contamination including discrete particles of high radioactivity. The presentation includes computer codes developed for conducting dose assessments (VARSKIN and SADDE).	
Length:	2 Days	14 Instructional Hours
Location:	NRC Regional Offices	
Conducted By:	IT Corporation	
Examination:	None	
Manual:	Skin Dosimetry Workshop Manual	
Prerequisites:	None	
Applicability:	This workshop provides refresher training for Reactor Health Physics Inspectors and supplemental training for other NRC personnel who require an understanding of skin dosimetry.	

Health Physics Technology Course (H-201)

Description:	The course provides a working understanding of health physics fundamentals applicable to NRC inspectors. Course topics include health physics responsibilities of NRC inspectors; internal and external exposure and control; health physics instrumentation and monitoring devices, survey requirements and procedures; evaluation of radiation hazards; ALARA; and development and analysis of inspection findings and licensee management organization and administrative controls such as records and training. At the end of some sessions, health physics problems specific to nuclear reactor and materials licensees are covered. For these sessions the class is divided to provide specialized training for Reactor Health Physics Inspectors and Materials Health Physics Inspectors.	
Length:	10 Days	67 Instructional Hours
Location:	NRC Technical Training Center, Chattanooga, Tennessee	
Conducted By:	TTC Staff and Invited Lecturers	
Examination:	Students demonstrate attainment of the required level of understanding by successful completion of written examinations.	
Manual:	Health Physics Technology Manual	
Prerequisites:	Prior completion of the Applied Health Physics Course (H-109), or equivalent college level training, is recommended. The Technical Training Center controls attendance. A hand-held calculator with exponential and logarithmic functions is recommended.	
Applicability:	This course is required for health physics inspectors and is supplemental for other NRC personnel who require an understanding of the applied health physics concepts and applications described above.	

Radwaste Management Course (H-202)

Description:	The course provides a working understanding of reactor plant radioactive waste management systems and the sources and principles related to non-reactor generated radioactive waste. Classroom presentations discuss the principal sources of radioactive waste, waste classification, and design and operation of containment, monitoring, and processing systems. Occupational exposures, off-site exposure pathways, and effluent and environmental monitoring requirements associated with radioactive waste processing are discussed.	
Length:	5 Days	32 Instructional Hours
Location:	NRC Technical Training Center, Chattanooga, Tennessee	
Conducted By:	IT Corporation	
Examination:	Students demonstrate attainment of the required level of understanding by successful completion of a written examination.	
Manual:	Radwaste Management Manual	
Prerequisites:	Successful completion of the GE Technology Course (R-106B) and the Westinghouse Technology Course (R-104P) and a knowledge of basic radiation safety principles.	
Applicability:	This course is required for reactor health physics inspectors and is supplemental for other NRC personnel who have a need to understand radioactive waste management systems.	

Advanced Radiological Environmental Monitoring Course (H-203)

Description:	The course includes 3 days of generic training and 5 days of site specific training. Topics covered include environmental monitoring objectives (legal, socioeconomic, and scientific), program scope (ecological, NPDES, and radiological), program design (sampling and analysis, reporting, and emergency response), and quality assurance (training, policies, procedures, documentation, and assessment of performance).	
Length:	8 Days	56 Instructional Hours
Location:	Atlanta, Georgia	
Conducted By:	Quantum Technology, Inc.	
Examination:	None	
Manual:	Advanced Radiological Environmental Monitoring Manual	
Prerequisites:	None. NRC Form 368 must be submitted to OP/EOS 30 to 60 days in advance of the course start date. Course information is provided by the Technical Training Center. Attendance is controlled by Quantum Technology, Inc.	
Applicability:	This course is recommended for NMSS Low Level Waste Management Division, Technical and Regulatory Branch personnel.	

Radiological Emergency Response and Operations Course (H-303)

Description:	The course provides a familiarity with the "on scene" response to radiological emergencies involving a nuclear power plant accident, a nuclear materials transportation accident, and a nuclear industrial accident. Presentations emphasize emergency response team organization, procedures, leadership, instruments, and equipment.	
Length:	9 Days	60 Instructional Hours
Location:	Las Vegas and Nevada Test Site, Mercury, Nevada	
Conducted By:	DOE/Reynolds Electrical & Engineering Co. (REECO)	
Examination:	None	
Manual:	Radiological Emergency Response and Operations Manual	
Prerequisites:	Students must have a knowledge of basic health physics. FEMA Form 75-5, available from Training Coordinators, must be submitted to the Technical Training Center 30 days before the start of the course. U. S. Citizenship required.	
Applicability:	This course is required training for emergency preparedness inspection personnel and is supplemental training for other NRC personnel involved in the development and inspection of radiological emergency plans and activities.	

Diagnostic and Therapeutic Nuclear Medicine Course (H-304)

Description:	The course provides an understanding of basic radiobiology; the facilities and equipment used in nuclear medicine departments; clinical diagnostic and therapeutic procedures involving the administration of radiopharmaceuticals to patients; safe handling of patients and the protection of staff and visitors; area radiation surveys; responsibilities of key personnel; function of the Radiation Safety Committee; ALARA program; and training requirements. Diagnostic and therapeutic misadministration, transport of radioactive materials and emergency procedures and recordkeeping requirements, quality assurance, calibrations, and waste disposal are also covered. Opportunities are provided for hands-on experience. Relevant portions of 10 CFR Part 35, "Medical Use of Byproduct Material" and USNRC Regulatory Guide 10.8, "Guide for the Preparation of Applications for Medical Use Programs" are emphasized.	
Length:	5 Days	36 Instructional Hours
Location:	To Be Determined	
Conducted By:	To Be Determined	
Examination:	Students demonstrate attainment of the required level of understanding by successful completion of a written examination.	
Manual:	Diagnostic and Therapeutic Nuclear Medicine Manual	
Prerequisites:	A knowledge of basic radiation protection is necessary. A hand-held calculator with exponential and logarithmic functions is recommended.	
Applicability:	This course is required for Materials Radiation Specialist Inspectors and is supplemental training for other NRC personnel.	

Safety Aspects of Industrial Radiography Course (H-305)

Description:	The course provides an understanding of radiography principles, sources, techniques and equipment, regulatory and licensing requirements for radiographic activities, regulatory requirements for handling, storing, shipping and transporting radiographic sources, radiographic incidents, inspection techniques for radiographic activities, and field industrial radiography operations. Opportunities are provided for hands-on experience.	
Length:	5 Days	36 Instructional Hours
Location:	Burlington, Massachusetts	
Conducted By:	Amersham Corporation	
Examination:	Students demonstrate attainment of the required level of understanding by successful completion of a written examination.	
Manual:	Industrial Radiography Manual	
Prerequisites:	A knowledge of basic radiation protection is necessary.	
Applicability:	This course is required for Materials Radiation Specialist Inspectors and is supplemental training for other NRC personnel.	

Radiological Emergency Planning Course (H-306)

Description:	The course provides an understanding of the following: regulatory requirements for nuclear reactor licensing; design basis accidents versus emergency action level guidelines and on-site/off-site radiological emergency preparedness planning; development and implementation of nuclear plant, local and state emergency plans; legal requirements, emergency response coordination and countermeasure techniques; information contained in Environmental Reports, Safety Analysis Reports, Emergency Planning Documents; and potential areas of interjurisdictional confrontation in emergency response and methods to minimize stress in such situations.	
Length:	5 Days	32 Instructional Hours
Location:	Emmitsburg, Maryland and other U.S. cities	
Conducted By:	Federal Emergency Management Agency (FEMA)	
Examination:	None	
Manual:	Radiological Emergency Planning Manual	
Prerequisites:	FEMA Form 75-5, available from Training Coordinators, must be submitted to the Technical Training Center 30 days before the start of the course.	
Applicability:	This course is required training for emergency preparedness inspection personnel and is supplemental training for other NRC personnel involved in the development and inspection of radiological emergency plans and activities.	

Radiological Accident Assessment Course (H-307)

Description:	The course provides an understanding of the duties and responsibilities of radiological accident assessment personnel; possible accident scenarios at a nuclear plant; the time significance of these events and the significant indicators of an accident; performance of off-site dose calculations given a specific source term and meteorological conditions; and use and interpretation of Federal Protection Action Guides as a basis for recommending appropriate protective measures to state and local officials.	
Length:	5 Days	32 Instructional Hours
Location:	Emmitsburg, Maryland and other U.S. cities	
Conducted By:	Federal Emergency Management Agency (FEMA)	
Examination:	None	
Manual:	Radiological Accident Assessment Manual	
Prerequisites:	A knowledge of basic algebra and health physics is necessary. FEMA Form 75-5, available from Training Coordinators, must be submitted to the Technical Training Center 30 days before the start of the course.	
Applicability:	This course is supplemental training for emergency preparedness personnel and other NRC personnel responsible for the assessment of radiological emergencies and for making recommendations/decisions regarding protective actions for public safety.	

Transportation of Radioactive Materials Course (H-308)

Description:	The course provides an understanding of radioactive material transport and the role of transport regulatory agencies and regulations (Titles 10 and 49 of the Code of Federal Regulations). Topics covered include limited quantities of radioactive material, instruments and articles, normal and special forms of radioactive materials, and low specific activity (LSA) radioactive materials. Basic concepts of package activity limitation, radiation and contamination limits, hazardous materials communications requirements, transportation safeguards, NRC inspection procedures, accident case histories, and emergency response are also covered. In addition to transportation issues, a brief overview of 10 CFR Part 61 waste generator requirements and waste classification system is presented.	
Length:	5 Days	32 Instructional Hours
Location:	To Be Determined	
Conducted By:	To Be Determined	
Examination:	Students demonstrate attainment of the required level of understanding by successful completion of a written examination.	
Manual:	Transportation of Radioactive Materials Manual	
Prerequisites:	A basic understanding of radiation safety principles is necessary.	
Applicability:	This course is required for Reactor Health Physics, Fuel Facility Specialist and Materials Specialist Inspectors and is supplemental training for other NRC personnel involved in the regulation or inspection of radioactive materials transportation activities.	

Health Physics in Radiation Accidents Course (H-309)

Description:	The course provides an understanding of radiation physics, radiation detection, protective clothing, and equipment; principles of internal dosimetry; radiological emergency procedures; and the role of the Health Physicist in the medical environment. Practical experience is provided by a combination of lectures, demonstrations, lab exercises and a simulated radiation accident drill.	
Length:	5 Days	32 Instructional Hours
Location:	Oak Ridge, Tennessee	
Conducted By:	Oak Ridge Institute for Science and Education's Radiation Emergency Assistance Center/Training Site (REAC/TS)	
Examination:	None	
Manual:	Health Physics in Radiation Accidents Manual	
Prerequisites:	A working knowledge of algebra and health physics principles is necessary. NRC Form 368 must be submitted to OP/EOS 30 to 60 days in advance of course start date. ORISE (REAC/TS) controls attendance, and an attendance fee, payable in advance, is charged.	
Applicability:	This course is supplemental training for NRC personnel involved in the development and inspection of emergency preparedness activities.	

Environmental Sampling and Analysis Course (H-310)

Description:	The course provides an understanding of the following: sampling and monitoring techniques for environmental media and in-plant samples; sample collection, chemical treatment and radio-analytical procedures; methods used in evaluation and reporting data; biological sampling and analysis of results; laboratory instrumentation and calibration; and quality assurance in independent measurements.	
Length:	5 Days	32 Instructional Hours
Location:	To Be Determined	
Conducted By:	To Be Determined	
Examination:	Students demonstrate attainment of the required level of understanding by successful completion of a written examination.	
Manual:	Environmental Sampling and Analysis Manual	
Prerequisites:	A basic understanding of health physics instrumentation principles is necessary.	
Applicability:	This course is required for Reactor Health Physics and Radioactive Materials Shipment Inspectors and is supplemental training for other NRC personnel.	

Respiratory Protection Course (H-311)

Description:	The course provides an understanding of the terminology and special problems associated with nuclear respiratory protection programs; selection, inspection, donning and use of respiratory protection devices; NUREG 0041 and other requirements unique to the nuclear industry; and practical experience in respirator fitting techniques, including several acceptable qualitative and quantitative fit test methods.	
Length:	5 Days	32 Instructional Hours
Location:	Various Locations	
Conducted By:	Darell Bevis Associates, Inc., Radiation Safety Associates, Inc., or Respirator Support Services	
Examination:	None	
Manual:	Respiratory Protection Manual	
Prerequisites:	NRC Form 368 must be submitted to OP/EOS 30 to 60 days in advance of course start date. Course information is provided by the Technical Training Center. Attendance is controlled by the firm conducting the training: Darell Bevis Associates, Radiation Safety Associates, or Respirator Support Services.	
Applicability:	This course is required for Reactor Health Physics Inspectors and is supplemental training for other NRC personnel.	

Internal Dosimetry and Whole Body Counting Course (H-312)

Description:	The course provides an understanding of the sources and hazards of internal deposition of radioactive material. Course topics include protective measures for preventing internal contamination, protocols for internal monitoring of personnel (technique and frequency), and dose evaluation models including ICRP 2, 10 and 26/30. Also covered are methods of evaluating extent of internal contamination including whole body counting procedures, calibration, quality assurance and data analysis and biological sampling procedures, types of samples which may be collected, collection procedures, processing of samples, quality assurance programs and reporting of results.	
Length:	5 Days	35 Instructional Hours
Location:	NRC Technical Training Center, Chattanooga, Tennessee	
Conducted By:	IT Corporation	
Examination:	Students demonstrate attainment of the required level of understanding by successful completion of a written examination.	
Manual:	Internal Dosimetry and Whole Body Counting Manual	
Prerequisites:	A knowledge of health physics principles is necessary. A hand-held calculator with exponential and logarithmic functions is required.	
Applicability:	This course is required for health physics inspectors and is supplemental training for other NRC personnel.	

Teletherapy and Brachytherapy Course (H-313)

Description:	<p>The course provides a basic understanding of clinical radiation therapy procedures and dosimetry involving primarily Cobalt-60 teletherapy (external irradiation) and various brachytherapy (implanted radionuclide) sources. Topics covered include facilities and equipment; safe handling of patients with implanted brachytherapy sources; inventories; and area radiation surveys. Responsibilities and authority of key personnel, Radiation Safety Committee, ALARA program, transport of radioactive materials, misadministrations, requirements for recordkeeping, quality assurance, teletherapy room design and shielding, teletherapy spot checks, calibrations, and source replacements are also discussed. Opportunities are provided for hands on experience. Relevant portions of 10 CFR Part 35, "Medical Use of Byproduct Material" and NRC Regulatory Guide 10.8, "Guide for the Preparation of Applications for Medical Use Programs" are emphasized.</p>	
Length:	5 Days	40 Instructional Hours
Location:	Cleveland, Ohio	
Conducted By:	NMA/Mallinckrodt, Inc.	
Examination:	Students demonstration attainment of the required level of understanding by successful completion of a written examination.	
Manual:	Teletherapy and Brachytherapy Manual	
Prerequisites:	A knowledge of basic radiation protection is necessary. A hand-held calculator with exponential and logarithmic functions is recommended.	
Applicability:	This course is required for Materials Radiation Specialist Inspectors and is supplemental training for other NRC personnel.	

Safety Aspects of Well Logging Course (H-314)

Description:	<p>The course provides an understanding of the principles of well logging in the gas and oil industry. NRC and Texas State regulations and inspection procedures, well logging equipment and operations, procedures related to retrieval of lost sources and irretrievable sources are also covered. Opportunities are provided for hands-on experience including a tour of a well site and demonstration of well logging procedures.</p>	
Length:	5 Days	38 Instructional Hours
Location:	Houston, Texas	
Conducted By:	Schlumberger Well Services and Texas Bureau of Radiation Control	
Examination:	<p>Students demonstrate attainment of the required level of understanding by successful completion of a written examination.</p>	
Manual:	Safety Aspects of Well Logging Manual	
Prerequisites:	<p>A knowledge of basic radiation protection is necessary. This course is co-sponsored by Schlumberger Well Services and the Texas Bureau of Radiation Control for State regulatory personnel with limited availability for NRC personnel. Requests for attendance are prioritized by NMSS. Attendance is controlled by SP.</p>	
Applicability:	<p>This course is supplemental training for Materials Radiation Specialist Inspectors and other NRC personnel.</p>	

Irradiator Technology Course (H-315)

Description:	The course provides an understanding of the basic operation of research and industrial irradiators including all safety and regulatory requirements; cobalt-60 source loading; safety systems; audits and self inspection items; equipment; control room and irradiator maintenance; radiation safety officer and operator responsibilities; wipe tests and radiation surveys; emergency procedures; commercial applications; dosimetry; regulations; licensing and inspections; and public and media relations. Opportunities are provided for hands-on experience.	
Length:	5 Days	35 Instructional Hours
Location:	Montreal, Canada	
Conducted By:	Nordion International, Inc.	
Examination:	Students demonstrate attainment of the required level of understanding by successful completion of a written examination.	
Manual:	Irradiator Technology for Inspectors Manual	
Prerequisites:	A knowledge of basic radiation protection is necessary.	
Applicability:	This course is supplemental training for Materials Radiation Specialist Inspectors and other NRC personnel.	

Health Physics Topical Review Course (H-401)
(Formerly Advanced Health Physics)

Description:	The course improves knowledge in current, state-of-the-art, and selected special topics relating to radiation protection. General topics covered include external and internal radiation exposure control and dose evaluations, health physics instrumentation, calibration and quality control, ALARA, respiratory protection, major revisions to regulations, codes, and methodologies. Special course topics are established by the TTC in conjunction with NRR and NMSS. Course topics are normally revised every 18 to 24 months. Attendance at any one course during the period specified in IMC 1245 satisfies the requirement.	
Length:	3 Days	21 Instructional Hours
Location:	NRC Technical Training Center, Chattanooga, Tennessee or other locations as appropriate.	
Conducted By:	IT Corporation, TTC Staff and Invited Lecturers	
Examination:	None	
Manual:	Health Physics Topical Review Manual	
Prerequisites:	Successful completion of the Health Physics Technology Course (H-201) and experience requirements as specified in NRC Inspection Manual Chapter 1245 are required. A hand-held calculator with exponential and logarithmic functions is recommended.	
Applicability:	This course can satisfy certain NRC Inspection Manual Chapter 1245 refresher training requirements for Reactor Health Physics Inspectors and is supplemental training for other NRC personnel who require an understanding of current developments and advanced health physics concepts as described above.	

Vital Equipment and Systems Course (S-102)

Description:	The course provides familiarity with basic reactor concepts and reactor plant vital equipment. Presentations emphasize the following areas: purpose major systems and components; physical location of major systems and components; vulnerability of systems and components to sabotage and the impact their loss would have on plant safety; background on vital equipment; and case studies.	
Length:	3 Days	21 Instructional Hours
Location:	NRC Technical Training Center, Chattanooga, Tennessee	
Conducted By:	NRC Technical Training Center and NRC Staff	
Examination:	Students demonstrate attainment of this knowledge by successful completion of a written examination.	
Manual:	Vital Equipment and Systems Manual	
Prerequisites:	None	
Applicability:	This course is required training for Physical Security Inspectors and supplemental training for other NRC personnel.	

Tactical Leadership Course (S-104)

Description:	Provides protective force supervisors with the knowledge to plan, prepare, and execute tactical responses to emergency situations. Training includes both classroom and field exercises. Attendees will understand the principles of tactical planning, understand tactical considerations in urban tactics, be familiar with tactical team movement and understand leadership principles.	
Length:	10 Days	70 Instructional Hours
Location:	Kirtland Air Force Base, Albuquerque, New Mexico	
Conducted By:	DOE Central Training Academy	
Examination:	None	
Manual:	Tactical Leadership Manual	
Prerequisites:	Completion of CTA course PFT-401, Basic Firearms Instructor Certification	
Applicability:	This course is supplemental training for Physical Security Inspectors and other NRC personnel.	

Safety Officer and Practical Training Orientation Course (S-105)

Description:	The course familiarizes safety personnel with weapons fundamentals; proper range operations; and an overview of firearms training, special response team (SR) procedures, rappelling procedures, use of chemical agents, and control of force-on-force exercises. Emphasis is placed in the following areas: familiarity with standard weapons and their mechanical safeties; familiarity with both tactical and safety briefings; familiarity with safety and training requirements in chemical agents; rappelling procedures; force-on-force exercises; safe practical firearms training; nomenclature and safety feature of weapons used by DOE; briefings in the conduct of safe range operations; and various levels of firearms training.	
Length:	5 Days	35 Instructional Hours
Location:	Kirtland Air Force Base, Albuquerque, New Mexico	
Conducted By:	DOE Central Training Academy	
Examination:	None	
Manual:	Safety Officer's Practical Training Orientation Manual	
Prerequisites:	None. Attendees must have the following equipment in their possession upon arrival for the course: hat/cap, sunglasses, jacket, boots with rubber soles for rappelling, rain gear, belt.	
Applicability:	This course is supplemental training for Physical Security Inspectors and other NRC personnel.	

Explosives Threat Recognition, Prevention, and Response Course (S-106)

Description:	Informs attendees about the constantly growing threat of explosive attack on DOE facilities and familiarizes them with explosives, appropriate management of bomb threats, search techniques, and safety and control measures.	
Length:	5 Days	35 Instructional Hours
Location:	Kirtland Air Force Base, Albuquerque, New Mexico	
Conducted By:	DOE Central Training Academy	
Examination:	None	
Manual:	Explosives Threat Recognition, Prevention, and Response Manual	
Prerequisites:	None	
Applicability:	This course is supplemental training for Physical Security Inspectors and other NRC personnel.	

Basic Crisis Negotiations Training Course (S-107)

Description:	This course covers the basic material needed to begin developing skill as a hostage negotiator. Emphasis is on small-group interaction and individual skill development in role-playing situations. Emphasis is placed on mastery of the basic techniques of hostage negotiation, describing in detail the common types of hostage takers, and the role of crisis negotiation in the overall resolution of an incident.	
Length:	5 Days	35 Instructional Hours
Location:	Kirtland Air Force Base, Albuquerque, New Mexico	
Conducted By:	DOE Central Training Academy	
Examination:	Participants are graded on their performance in both practical exercises and a final examination.	
Manual:	Basic Crisis Negotiations Training Manual	
Prerequisites:	There are no prerequisites for this course. However, a background in physical tactics is considered helpful since the course stresses the importance of negotiators and SRT personnel working closely to resolve a barricade/hostage incident. Special Response Training (SRT I) is recommended.	
Applicability:	This course is supplemental training for Physical Security Inspectors and other NRC personnel.	

Advanced Crisis Negotiations Training Course (S-108)

Description:	This course augments skills learned in the Basic Crisis Negotiations Training Course by providing actual practice under the critical eye of experienced hostage negotiators. Students encounter, during realistic simulations, a variety of barricaded subjects and hostage-takers. Students also receive thorough, updated briefings on the current terrorist threat and various levels of DOE response.	
Length:	5 Days	35 Instructional Hours
Location:	Kirtland Air Force Base, Albuquerque, New Mexico	
Conducted By:	DOE Central Training Academy	
Examination:	None	
Manual:	Advanced Crisis Negotiations Training Manual	
Prerequisites:	Students must have completed Basic Crisis Negotiations Training prior to attending this course. A background in physical tactics is considered helpful since the course stresses the importance of negotiators and SRT personnel working closely to resolve a barricade/hostage incident.	
Applicability:	This course is supplemental training for Physical Security Inspectors and other NRC personnel.	

Security Crisis Management Training Course (S-112)

Description:	The course focuses on security-incident crises and provides essentials for basic operations of an emergency operations center in connection with a tactical and hostage negotiations response capability. Scenarios emphasizing security-related crises (including ES&H issues) are used with emphasis on communications, coordination, and management.	
Length:	3 Days	20 Instructional Hours
Location:	Kirtland Air Force Base, Albuquerque, New Mexico	
Conducted By:	DOE Central Training Academy	
Examination:	None	
Manual:	Security Crisis Management Manual	
Prerequisites:	This course requires appropriate clearance for access for SNSI material.	
Applicability:	This course is supplemental training for Physical Security Inspectors and other NRC personnel.	

Analytic System and Software for Evaluation Safeguards and Security (ASSESS) Course
(S-115)

Description:	Provides instruction in the use of ASSESS, a computer-based tool for conducting vulnerability assessments to evaluate safeguards and security effectiveness primarily against theft of nuclear material. The course focuses on the underlying and modeling approaches employed in ASSESS and hands-on training in the use of ASSESS software. Advanced topics in insider and outsider scenario development will also be discussed.	
Length:	10 Days	70 Instructional Hours
Location:	Kirtland Air Force Base, Albuquerque, New Mexico	
Conducted By:	DOE Central Training Academy	
Examination:	None	
Manual:	Analytic Sys. & Software for Evaluating S/G and Security Manual	
Prerequisites:	This course requires appropriate clearance for access to SNSI material and successful completion of CTA-140, Vulnerability Assessment Fundamentals.	
Applicability:	This course is supplemental training for Physical Security Inspectors and other NRC personnel.	

Computer Security Course (S-116)

Description:	The course provides the training necessary for the participants to teach the CSSO Training Seminar at their sites. The requirements of DOE Order 5637.1, Classified Computer Security Program, are emphasized. Students participate in workshops designed to demonstrate the steps required to obtain accreditation for a DOE classified Automatic Data Processing (ADP) system.	
Length:	5 Days	35 Instructional Hours
Location:	Kirtland Air Force Base, Albuquerque, New Mexico	
Conducted By:	DOE Central Training Academy	
Examination:	None	
Manual:	Computer Security Manual	
Prerequisites:	Attendees must be assigned computer security training responsibilities. This course requires appropriate clearance for access to SNSI material.	
Applicability:	This course is supplemental training for Physical Security Inspectors and other NRC personnel.	

Operations Security I Course (S-117)

Description:	This course introduces attendees to the following topics: techniques of hostile intelligence, electronic warfare, sabotage, subversion, sources of intelligence, countermeasures, and the relationships between OPSEC and other safeguards and security (S&S) programs.	
Length:	3 Days	21 Instructional Hours
Location:	Kirtland Air Force Base, Albuquerque, New Mexico	
Conducted By:	DOE Central Training Academy	
Examination:	None	
Manual:	Operations Security Manual	
Prerequisites:	Attendees must be assigned to OPSEC duties. This course requires appropriate clearance for access to SNSI material.	
Applicability:	This course is supplemental training for Physical Security Inspectors and other NRC personnel.	

Sensor Systems Course I (S-118)

Description:	This course addresses the physical protection, detection, assessment, and entry control systems used as part of the overall DOE Safeguards and Security program. Specific topical areas include systems philosophy and concepts, interior and exterior sensors, entry control systems and SNM portal detectors, and alarm communication/displays and assessments.	
Length:	5 Days	35 Instructional Hours
Location:	Kirtland Air Force Base, Albuquerque, New Mexico	
Conducted By:	DOE Central Training Academy	
Examination:	None	
Manual:	Sensor Systems Manual	
Prerequisites:	This course requires appropriate clearance for access to SNSI material.	
Applicability:	This course is supplemental training for Physical Security Inspectors and other NRC personnel.	

Tamper Indicating Devices Course (S-119)

Description:	The course trains administrators, trainers and coordinators how to conduct a proper Tamper Indicating Devices (TID) Program. The guiding principles of this course are taken from DOE Order 5633.3, Control and Accountability of Nuclear Materials, and DOE TID handbooks, reference manuals, and guides.	
Length:	2 Days	14 Instructional Hours
Location:	Kirtland Air Force Base, Albuquerque, New Mexico	
Conducted P	DOE Central Training Academy	
Examination:	None	
Manual:	Tamper Indicating Device Manual	
Prerequisites:	This course requires appropriate clearance for access to SNSI material.	
Applicability:	This course is supplemental training for Physical Security Inspectors and other NRC personnel.	

Physical Security Course (S-120)

Description:	The course covers the origin and development of physical security, organizational needs and physical barriers, facility layout, personnel entrances, security system devices, and application.	
Length:	5 Days	35 Instructional Hours
Location:	Various	
Conducted By:	General Services Administration	
Examination:	None	
Manual:	Physical Security Manual	
Prerequisites:	None. NRC Form 368 must be submitted to OP/EOS 30 to 60 days in advance of the course start date. Course information is provided by the Technical Training Center. Attendance is controlled by the General Services Administration.	
Applicability:	This course is recommended for NMSS Safeguards and Transportation Division, International Safeguards Branch personnel.	

Nuclear Threats, Awareness, and Response Course (S-121)

Description:	There are two distinct 4 day seminars dealing with awareness and response respectively. The Awareness Seminar covers the potential for nuclear terrorism against nuclear reactors, nuclear facilities and nuclear explosives, the spectrum of threats, what constitutes a credible threat, and national resources for combating threats. The Response Seminar covers the methods for evaluating the credibility of a threat and the methods used to respond to the threat.	
Length:	4 Days (Each)	32 Instructional Hours (Each)
Location:	Albuquerque, New Mexico and DOE Nevada Test Site, Nevada	
Conducted By:	Eagle Research Group, Inc.	
Examination:	None	
Manual:	Nuclear Threats, Awareness, and Response Manual	
Prerequisites:	None. The Technical Training Center coordinates attendance.	
Applicability:	This course is recommended for NMSS Safeguards and Transportation Division, International Safeguards Branch personnel.	

Safeguards Technology Course (S-202)

Description:	The course provides information relating to conducting performance testing and evaluation of physical protection systems. Major topics addressed include: general physical protection system testing and evaluation concepts; entry control; interior intrusion detection; exterior intrusion detection; alarm assessment; alarm communication and display and barriers and locks.	
Length:	To Be Determined	TBD Instructional Hours
Location:	To Be Determined	
Conducted By:	To Be Determined	
Examination:	Students demonstrate attainment of this knowledge by successful completion of a written examination.	
Manual:	Safeguards Technology Manual	
Prerequisites:	None	
Applicability:	This course is required training for Physical Security Inspectors and supplemental training for other NRC personnel.	

Management of Intrusion Detection Systems Course (S-310)

Description:	The course provides a working knowledge of intrusion detection system design, operational theory, counter-measures, installation methods and maintenance practices; operation of microwave (indoor and outdoor), ultrasonic, capacitance, vibration, audio, passive infrared, and balanced magnetic contact systems, sound masking as used in SAO, SCI and SI facilities, CCTV systems and access control.	
Length:	5 Days	35 Instructional Hours
Location:	Norfolk, Virginia	
Conducted By:	Norfolk Naval Shipyard	
Examination:	Students demonstrate attainment of this knowledge by successful completion of a written examination.	
Manual:	Management of Intrusion Detection Systems Manual	
Prerequisites:	NRC Form 368 must be submitted to OP/EOS 30 to 60 days in advance of course start date. Norfolk Naval Shipyard controls attendance.	
Applicability:	This course is supplemental training for Physical Security Inspectors and other NRC personnel.	

Safeguards Technology Refresher Course (S-402)

Description:	This course provides a review and update of physical protection technology.	
Length:	2-3 Days	14-21 Instructional Hours
Location:	Kirtland Air Force Base, Albuquerque, New Mexico	
Conducted By:	Sandia National Laboratories (Sponsored by DOE and NRC)	
Examination:	None	
Manual:	Course Notes	
Prerequisites:	None	
Applicability:	This course is required refresher training for Physical Security Inspectors and supplemental training for other NRC personnel. Requirements for this course can be satisfied by attendance at the Physical Protection Update conducted by Sandia National Lab., sponsored jointly by NRC and DOE approximately every 2 years.	

Fundamentals of Nondestructive Assay of Nuclear Material Course (S-602)

Description:	The course provides a general understanding of basic neutron and gamma detection methods; gamma-ray measurement of uranium enrichment; quantitative plutonium assay using gamma-ray, neutron singles, and neutron coincidence counting methods for both plutonium and uranium samples. Instruction is provided in gamma-ray and neutron based nondestructive assay techniques, based upon commercially available portable instrumentation.	
Length:	5 Days	35 Instructional Hours
Location:	Los Alamos, New Mexico	
Conducted By:	DOE, Los Alamos National Laboratory (LANL)	
Examination:	None	
Manual:	Course Notes	
Prerequisites:	NRC Form 368 must be submitted to OP/EOS 30 to 60 days in advance of course start date. Los Alamos National Laboratory controls attendance. The tuition cost for NRC employees is waived; however, there is a nominal materials and supplies fee.	
Applicability:	This course is required training for Safeguards Materials Control and Accountability Inspectors and is supplemental training for other NRC personnel.	

Neutron Assay of Nuclear Material Course (S-603)

Description:	The course consists of a combination of lectures and laboratory sessions on active and passive neutron assay. The lectures cover the principles of neutron interactions in materials, neutron sources, and detectors. The laboratory sessions are selected from topics such as neutron coincidence counting, delayed neutron measurements, photoneutron interrogation and pulsed neutron generators. Nuclear fuel cycle materials such as plutonium and uranium metals, oxides, and fabricated fuel rods are assayed. Emphasis is on understanding the design features, measurement principles, and relative capabilities of these techniques.	
Length:	5 Days	35 Instructional Hours
Location:	Los Alamos, New Mexico	
Conducted By:	DOE, Los Alamos National Laboratory (LANL)	
Examination:	None	
Manual:	Course Notes	
Prerequisites:	Successful completion of the Fundamentals of Nondestructive Assay of Nuclear Material (S-602) or equivalent experience is strongly recommended. NRC Form 368 must be submitted to OP/EOS 30 to 60 days in advance of course start date. LANL controls attendance. The tuition cost for NRC employees is waived; however, there is a nominal materials and supplies fee.	
Applicability:	This course is required training for Safeguards Materials Control and Accountability Inspectors and is supplemental training for other NRC personnel.	

Gamma-Ray Assay of Nuclear Material Course (S-604)

Description:	The course provides an overview of the use of high-resolution gamma-ray spectroscopy in the nondestructive assay of plutonium and uranium in various materials. The course emphasizes laboratory experience, but includes a number of formal lectures. Topics include: general techniques of high-resolution spectroscopy, transmission correction factors, and absorption-edge densitometry. Demonstrations of automated systems are given.	
Length:	5 Days	35 Instructional Hours
Location:	Los Alamos, New Mexico	
Conducted By:	DOE, Los Alamos National Laboratory (LANL)	
Examination:	None	
Manual:	Course Notes	
Prerequisites:	Successful completion of the Fundamentals of Nondestructive Assay of Nuclear Material (S-602) or equivalent experience is strongly recommended. NRC Form 368 must be submitted to OP/EOS 30 to 60 days in advance of course start date. LANL controls attendance. The tuition cost for NRC employees is waived; however, there is a nominal materials and supplies fee.	
Applicability:	This course is required training for Safeguards Material Control and Accountability Inspectors and is supplemental training for other NRC personnel.	

Criticality Course (S-605)

Description:	The 2, 3, and 5 day courses cover the following materials in various degrees of depth: safety philosophy, basic concepts, idealized and real fissioning systems, time behavior of fissioning systems, minimum critical mass, factors influencing criticality and practical criticality control, basic methods for criticality safety analyses, criticality safety analyses, transportation considerations, administrative practices, and hands-on laboratory sessions.	
Length:	2/3/5 Days	16/24/40 Instructional Hours
Location:	Los Alamos, New Mexico	
Conducted By:	Los Alamos National Laboratory	
Examination:	None	
Manual:	Handout Materials	
Prerequisites:	None. The Technical Training Center coordinates attendance.	
Applicability:	This course is recommended for NMSS Fuel Cycle Safety Branch personnel.	

Fundamentals of Inspection Course (G-101)

Description:	The course provides a basic understanding of the NRC inspection program; personal conduct of inspector; legal aspects of inspections; preparation for an inspection; effective communication during inspections; performing an inspection; conducting entrance and exit meetings with licensee management; documenting inspection results, evaluation of licensee management effectiveness; handling allegations; enforcement of NRC regulations and license conditions; backfitting; licensee corrective action systems; emergency preparedness/follow-up of a major accident; participation in public hearings; Freedom of Information Act and informing the public.	
Length:	4 Days	28 Instructional Hours
Location:	Bethesda, Maryland or Regional Offices	
Conducted By:	Selected Staff Members	
Examination:	None	
Manual:	Fundamentals of Inspection Manual	
Prerequisites:	None	
Applicability:	This course is required training for most NRC inspection personnel. See NRC Inspection Manual Chapter 1245 for exceptions.	

Fundamentals of Inspection Refresher Course (G-102)

Description:	The course reinforces inspections skills and techniques, covers lessons learned, and provides an opportunity for NRR and NMSS management to communicate their expectations to inspectors. Included in the topics are the Commission's Principles of Good Regulation.	
Length:	1 Day	7 Instructional Hours
Location:	Bethesda, Maryland, Regional Offices, or the NRC Technical Training Center in Chattanooga, Tennessee	
Conducted By:	Selected Staff Members	
Examination:	None	
Manual:	Handout Materials	
Prerequisites:	Completion of the Fundamentals of Inspection Course (G-101) or Inspection Procedures Course (G-108)	
Applicability:	This course is required refresher training for most NRC inspection personnel. See NRC Inspection Manual Chapter 1245 for exceptions.	

Non-Power Reactor Technology Course (G-106)

Description:	The course provides a general familiarity with non-power reactor designs, facilities, equipment, operating characteristics, technical specifications, inspection requirements, and current areas of concern to the NRC.	
Length:	5 Days	32 Instructional Hours
Location:	NRC Technical Training Center, Chattanooga, Tennessee	
Conducted By:	Contractor Personnel and NRC Staff	
Examination:	Students demonstrate attainment of the required level of knowledge by successful completion of a written examination.	
Manual:	Non-Power Reactor Technology Manual	
Prerequisites:	None. A technical background is desirable.	
Applicability:	This course is required training for Non-Power Reactor Inspectors and supplemental training for other NRC personnel.	

Examination Techniques Course (G-107)

Description:	The course provides familiarity with basic examiner techniques for written, simulator and walkthrough examinations. Presentations emphasize the following areas: techniques in the use of facility and NRC reference material to construct written examinations, simulator scenarios and walkthrough examinations that comply with the examiner standards; techniques for writing content valid questions that comply with the Examiners' Handbook for Developing Licensing Examinations and with the examiner standards; techniques for the evaluation of candidate performance.	
Length:	10 Days	67 Instructional Hours
Location:	NRC Technical Training Centers, Chattanooga, Tennessee	
Conducted By:	NRC Technical Training Center Staff and Operator Licensing Branch Staff	
Examination:	Students demonstrate attainment of an acceptable level of knowledge by successful completion of class exercises.	
Manual:	Handout Materials	
Prerequisites:	Registration is limited to those individuals presently in an operator licensing examiner qualification program or those having status as a certified Operator Licensing Examiner.	
Applicability:	This course is required training for all regional and headquarters Operator License Examiners.	

Inspection Procedures Course (G-108)

Description:	The course provides a good understanding of materials related health physics inspections. Course topics include: how to prepare for, schedule, and conduct a routine inspection; enforcement; instrumentation theory; medical inspections; broad license inspections; radiography and well logging operations; industrial devices and sources; inspection documentation; communications with the media; transportation of radioactive materials; incident responses and reporting and licensee performance evaluation factors.	
Length:	5 Days	36 Instructional Hours
Location:	Various	
Conducted By:	SP Staff, Regional State Programs Liaison	
Examination:	A diagnostic quiz is administered on the first day and a final examination on the last day of the course. Additionally, pre-course homework problems are completed. Casework problems and a complete, realistic, inspection exercise are also conducted.	
Manual:	Inspection Procedures Manual	
Prerequisites:	None. SP controls attendance, and space for NRC personnel is limited.	
Applicability:	This course is required training for Materials Health Physics Inspectors.	

Licensing Practices and Procedures Course (G-109)

Description:	The course covers licensing procedures for gauges, gas chromatography, medical, academic/research and development, well logging, and industrial radiography. Also included are deficiency letter writing and sealed source and device catalog review.	
Length:	5 Days	33 Instructional Hours
Location:	Various	
Conducted By:	SP Staff	
Examination:	Students demonstrate attainment of the required level of understanding by successful completion of a written examination at the conclusion of the course.	
Manual:	Licensing Practices and Procedures Course Manual	
Prerequisites:	None. The TTC coordinates attendance for NRC staff.	
Applicability:	This course is recommended for NMSS licensing personnel.	

Environmental Regulation Course (G-110)

Description:	The course covers the content, scope, and intent of all major environmental regulations and amendments; the interrelationships among the various laws, regulations, and agencies; EPA permitting and enforcement approaches; the policies, programs, and procedures used by companies to comply with environmental regulations; practical problems in compliance; and recommended courses of action for compliance.	
Length:	3 Days	21 Instructional Hours
Location:	Various	
Conducted By:	Executive Enterprises, Inc.	
Examination:	None	
Manual:	Environmental Regulation Manual	
Prerequisites:	None. NRC Form 368 must be submitted to OP/EOS 30 to 60 days in advance of the course start date. Course information is provided by the Technical Training Center. Attendance is controlled by Executive Enterprises, Inc.	
Applicability:	This course is recommended for NMSS Low Level Waste Management (Regulatory Branch) and High Level Waste Management (Systems Engineering and Evaluation Branch) personnel.	

MORT--Accident/Incident Investigation Workshop (G 00)

Description:	The workshop provides an understanding of techniques to evaluate management policies and systems relating to safety; specific oversights and omissions, assumed risks and general management systems weaknesses; causes of an accidental occurrence and the prevention of similar occurrences to improve the safety of operations; a system safety concept; and techniques to define safety responsibilities to reduce errors and the application of analytical procedures to all phases of the safety effort.	
Length:	10 Days	76 Instructional Hours
Location:	Various cities throughout the U.S.	
Conducted By:	EG&G Idaho, Inc.	
Examination:	None	
Manual:	MORT A/I Manual	
Prerequisites:	None	
Applicability:	This course is supplemental training for NRC personnel and is typically attended by personnel who are assigned accident/incident investigation responsibilities. This course combines the MORT Seminar (G-201) and the Accident/Incident Investigation Workshop (G-202).	

Management Oversight and Risk Tree Analysis (MORT) Seminar (G-201)

Description:	The workshop provides an understanding of evaluation of management policies and systems relating to safety; specific oversights and omissions, assumed risks and general management systems weaknesses; application of the method for determining the causes and contributing factors of an accident; a system safety concept, and application of analytical procedures to all phases of the safety effort.	
Length:	5 Days	36 Instructional Hours
Location:	Various cities throughout the U.S.	
Conducted By:	EG&G Idaho, Inc.	
Examination:	None	
Manual:	Management Oversight and Risk Tree Analysis Manual	
Prerequisites:	None	
Applicability:	This course is supplemental training for NRC personnel. It is typically attended by personnel who are assigned accident/incident investigation responsibilities.	

Accident/Incident Investigation Workshop (G-202)

Description:	The workshop provides an understanding of the causes of an accidental occurrence and the prevention of similar occurrences to improve the safety of operations; the ability to define safety responsibilities to reduce errors; and the ability to assess the effectiveness of practical corrective actions which are based upon a relatively small number of serious accidents.	
Length:	8 Days	56 Instructional Hours
Location:	Various cities throughout the U.S.	
Conducted By:	EG&G Idaho, Inc.	
Examination:	None	
Manual:	Accident/Incident Investigation Manual	
Prerequisites:	Completion of a MORT Seminar (G-201) is required.	
Applicability:	This course is supplemental training for NRC personnel and is typically attended by personnel who are assigned accident/incident investigation responsibilities.	

Accident/Incident Investigation Workshop Refresher (G-203)

Description:	The workshop provides a review and reinforcement of the causes of an accidental occurrence and the prevention of similar occurrences to improve the safety of operations; an understanding sufficient to define safety responsibilities to reduce errors; and an understanding sufficient to assess the effectiveness of practical corrective actions which are based upon a relatively small number of serious accidents.	
Length:	3 Days	21 Instructional Hours
Location:	Various cities throughout the U.S.	
Conducted By:	EG&G Idaho, Inc.	
Examination:	None	
Manual:	Accident/Incident Investigation Manual	
Prerequisites:	Completion of the Accident/Incident Investigation Workshop (G-202) is required.	
Applicability:	This course is supplemental training for NRC personnel and is typically attended by personnel who are assigned accident/incident investigation responsibilities.	

MORT Based Root Cause Analysis Workshop (G-204)

Description:	The workshop provides knowledge and hands-on capability for performance of root cause analysis. The workshop provides an overview of the basic root cause concepts and the practical ways in which these concepts can be applied. Students are instructed in the basic technical methods utilized in performing root cause analysis and are provided with guidance in applying these basic tools to practical operational problems. Student exercises provide hands-on application of the basic methods and total root cause process through use of actual case studies.	
Length:	2 Days	14 Instructional Hours
Location:	Various cities throughout the U.S.	
Conducted By:	EG&G Idaho, Inc.	
Examination:	None	
Manual:	MORT Based Root Cause Manual	
Prerequisites:	None	
Applicability:	This course is supplemental training for NRC personnel and is typically attended by personnel who are assigned accident/incident investigation responsibilities.	

Root Cause/Incident Investigation Workshop (G-205)

Description:	The workshop provides attendees with an introduction to root cause analysis, events and causal factors analysis, interviewing witnesses, failure recognition and analysis, change analysis, energy (hazard)-barrier-target analysis, analytical trees, personnel reliability, MORT analysis, assembling facts and conclusions and building a defensible argument (oral briefing). Emphasis is placed on conducting information gathering interviews; model videotapes are used to illustrate specific interviewing techniques. Case studies are utilized to illustrate methods, foster teamwork and practice interviewing and briefing techniques.	
Length:	5/7 Days	35/49 Instructional Hours
Location:	Bethesda, Maryland or Regional Offices	
Conducted By:	Conger and Elsea, Inc.	
Examination:	None	
Manual:	Root Cause/Incident Investigation Workshop Manual	
Prerequisites:	None	
Applicability:	This course is supplemental training for NRC personnel and is typically attended by personnel who are assigned accident/incident investigation responsibilities.	

Inspecting for Performance Course (G-303)

Description:	The course provides an understanding of the concepts of performance-oriented inspection; performance-oriented inspection tools and techniques and insight on and understanding of how to apply these inspection tools and techniques effectively. The course is presented through lectures and discussions as well as workshops which allow the students, individually and in groups to examine, exercise, and critique the use of performance-oriented inspection tools and techniques.	
Length:	3 Days	18 Instructional Hours
Location:	NRC Technical Training Center, Chattanooga, Tennessee and other locations as announced	
Conducted By:	BarTech, Inc.	
Examination:	Students demonstrate attainment of an acceptable level of knowledge of successful completion of a written examination.	
Manual:	Inspecting for Performance Manual	
Prerequisites:	None	
Applicability:	The course is required training for all NRC inspector personnel.	

PRA Basics for Inspection Applications Course (G-500)

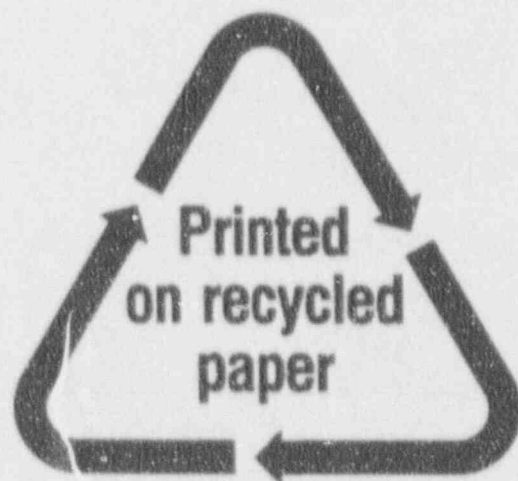
Description:	The course provides the full range of Probabilistic Risk Assessment (PRA) topics in abbreviated form with the goal of introducing the basic concepts and terminology of PRAs as applied to the NRC inspection process. The course describes the contents of actual plant PRAs, and stresses the use of existing studies in planning audits and inspections and evaluating plant safety issues, as opposed to reviewing or actually performing a PRA. A large portion of the course is devoted to teaching students how to extract and apply the information documented in PRAs for their own plant inspection and review activities.	
Length:	4 Days	26 Instructional Hours
Location:	NRC Technical Training Center, Chattanooga, Tennessee and other locations as announced	
Conducted By:	Idaho National Engineering Laboratory	
Examination:	Students demonstrate attainment of the required level of knowledge by successful completion of a comprehensive written examination.	
Manual:	PRA Applications for Nuclear Reactor Inspection Manual	
Prerequisites:	Knowledge of BWR and PWR systems, at least equivalent to the 100 level GE and Westinghouse Technology Courses, is required. A college level course in calculus, statistics, or probability theory is desirable although a limited review of statistics is provided. A multi-function calculator is required. The Office of Personnel controls attendance.	
Applicability:	This course is required training for reactor operations, engineering support, construction, emergency preparedness, NRR reactor design, NRR reactor and non-power reactor inspectors. It is supplemental training for other NRC personnel. Inspectors should take this course rather than PRA Fundamentals.	

Incident Investigation Team (IIT) Training Course (G-600)

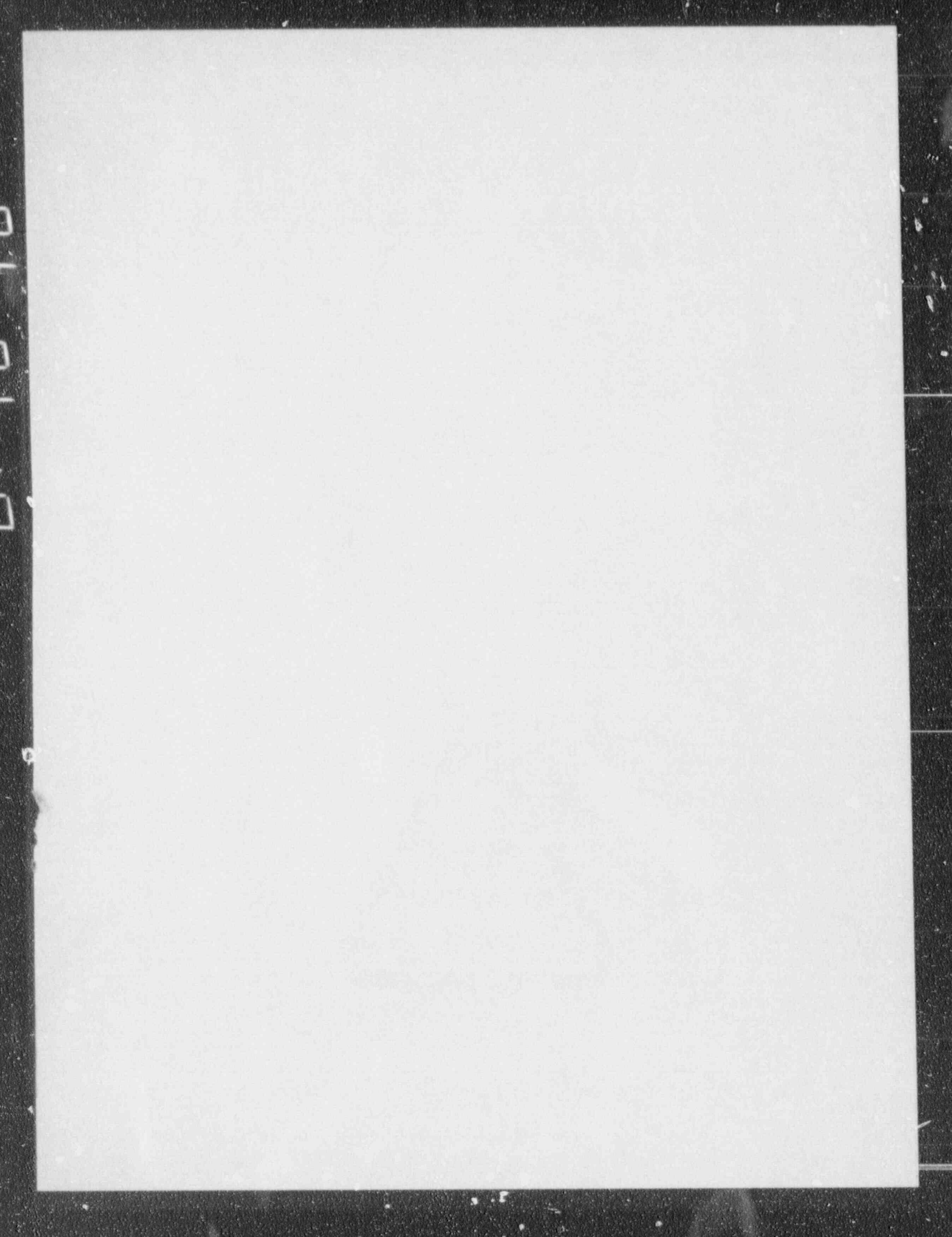
Description:	The course provides selected NRC staff members with training in incident investigation. Course topics include the incident investigation program; investigation perspectives; investigation guidelines; communications techniques (news media, press conference) and investigation analytical techniques. The course includes a workshop where the investigation analytical techniques are applied to case studies. Students are grouped into individual teams for this exercise.	
Length:	10 Days	82 Instructional Hours
Location:	As Announced	
Conducted By:	NRC Staff and EG&G InterTech	
Examination:	None	
Manual:	Handouts and Accident/Incident Investigation Workshop Manual	
Prerequisites:	Attendance is limited to personnel who have been approved as team leaders or expert members for the Incident Investigation Teams. Course attendance is coordinated by AEOD management.	
Applicability:	This course is provided for personnel approved as team leaders or expert members for the Incident Investigation Teams.	

Incident Investigation Team (IIT) Refresher Course (G-601)

Description:	The course provides IIT leaders and members a review and reinforcement of the incident investigation program and procedures; investigation perspectives and guidelines; basic analytical techniques and integrating information from analysis techniques to develop findings and conclusions.	
Length:	2 Days	14 Instructional Hours
Location:	As Announced	
Conducted By:	NRC Staff and Contractor Personnel	
Examination:	None	
Manual:	Handouts and Accident/Incident Investigation Manual	
Prerequisites:	Attendance is limited to personnel who have attended the Incident Investigation Team Training Course (G-600) or participated as a member of an IIT. Attendance is coordinated by AEOD management.	
Applicability:	This course is refresher training for personnel approved as team leaders or subject area expert members for Incident Investigation Teams.	



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