



FY 2022 DEFENSE NUCLEAR WEAPONS SCHOOL Radiological & Nuclear Training



A Division of the
Defense Threat Reduction Agency





DNWS Overview

The Defense Nuclear Weapons School (DNWS) is located on Kirtland Air Force Base, in Albuquerque, New Mexico. In existence since 1947, this Defense Threat Reduction Agency (DTRA) school is a unique entity that provides training to the Department of Defense (DoD), and other federal, state, and local agencies on: Nuclear and Radiological Weapons; Nuclear Accident/Incident Command, Control and Response; Explosive Ordnance Disposal (EOD) Threat Awareness/Assessment; Weapons of Mass Destruction (WMD); and Chemical, Biological, Radiological and Nuclear (CBRN) modeling.

Mission: The Defense Nuclear Weapons School provides nuclear weapons core competencies and radiological/nuclear WMD training and education to DoD, interagency organizations, and international partners, to ensure a strong nuclear deterrence, prepare an effective accident/incident response force, and enable countering of WMD-cbrn threats.

Training Objectives: The school's training objectives are to create, develop, and implement professional training through both traditional methods and innovative training technologies. DNWS training helps to ensure that our nation maintains a safe, reliable, and credible nuclear deterrent, nuclear accident and incident response, radiological force protection and CWMD hazard recognition for the warfighter and responder.

Courses: The DNWS delivers instructor-led courses in-residence and via Mobile Training Teams (MTTs), and offers several distance learning courses online. The DNWS also hosts courses presented by the U.S. Army Nuclear and CWMD Agency (USANCA) and the Air Force Institute of Technology (AFIT), providing facilities, instructors, subject matter expertise, and administrative support. While most courses are taught in-residence at the DNWS, an expanding array of courses are offered via distance learning or MTT. Additionally, the DNWS provides experts who teach modules within courses taught by other federal entities such as the Department of State and the Federal Bureau of Investigation.

History: The school's history dates back to the Manhattan Engineer District, the organization that developed the world's first atomic bomb. Lieutenant General Leslie Groves, the director of the Manhattan Project, established the Armed Forces Special Weapons Project (AFSWP) on the U.S. Army's Sandia Base in 1947. General Groves hand selected 63 West Point graduates to man the AFSWP. These men were known as the Sandia Pioneers. One pioneer with an advanced degree and a background in military training, Colonel John A. Ord, was chosen to establish the Technical Training Group (TTG) to provide integral training in this revolutionary new warfare specialty.

The TTG's original core curricula was focused on the complex assembly of the first nuclear weapons. Nuclear weapon response was included as "disaster and salvage" training within these early courses, with bomb disposal classes added as early as 1948. Nuclear weapons orientation classes were also provided. As nuclear weapons evolved, the services took over more of the hands-on training of their weapons technicians while the school added more radiological defense training.

The TTG underwent several name changes over the early years: Special Weapons Training Group from 1956-1959; Atomic Weapons Training Group from 1960-1966; and Nuclear Weapons School from 1967-1971. In 1971, the Defense Atomic Support Agency (DASA), which managed the school, was disestablished and directed to transfer the school to the U.S. Air Force. The Air Force renamed it the Inter-service Nuclear Weapons School. In 1993, the school was transferred back to the Defense Nuclear Agency (DNA) and was subsequently renamed the Defense Nuclear Weapons School in 1995. DNA later became DTRA.

Throughout its history, DNWS has supported the Office of the Secretary of Defense, the Joint Chiefs of Staff, the military Services, and the Combatant Commands by providing training, advice, and other services in the fields of nuclear weapons and countering of radiological and nuclear WMD.

The DNWS operates DoD's only radiological training sites. These sites are thorium-seeded fields that DNWS instructors use as an integral part of field training for radiological emergency team members. DNWS conducts a variety of radiological accident exercises at these training sites, as well as other local training areas, providing a realistic environment where students can apply their classroom knowledge. Students receive hands-on instruction and experience in the use of radioac-

tivity monitoring instruments; the proper donning of personal protective equipment; the collection of airborne radioactivity samples; procedures for cleaning, inspecting, and proper wear of respiratory protection; and in the setup and operation of contamination control stations. Students must integrate various modules of classroom instruction into intricate scenarios and determine what steps and equipment are required.

DNWS also supports the rich nuclear history of New Mexico with guided instructional site visits to the Trinity Test site, the 1950 B-29 Crash site, EMP test sites and other historic locations. Visits to these sites are coordinated through the Partnership, Training and Education Program (PTEP) and provide prospective students with training, education, and historical perspective in specialized topic areas.

In addition, DNWS manages and operates the only DoD classified Nuclear Weapons Instructional Museum (NWIM). The NWIM is an irreplaceable repository that traces the history and development of the U.S. nuclear weapons stockpile from its inception to the present and displays examples of all stockpiled U.S. nuclear weapons, associated components and delivery systems, and related training aids. Tours are provided in conjunction with some courses conducted at the DNWS and vary in length from two to four hours depending on the audience. Separate arrangements can be made for groups and visitors to tour the NWIM. Classified tours require a DoD Secret security clearance with Restricted Data (RD) or Critical Nuclear Weapons Design Information (CNWDI) access, or a Department of Energy "Q" clearance to participate. Unclassified tours are also available upon request. To solicit a special tour of the NWIM, a written request must be submitted and received a minimum of 15 working days before the scheduled tour date. Download a sample NWIM tour request letter or locate the form in the DNWS catalog.

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Non-Attribution Policy

The Defense Nuclear Weapons School offers its assurances that presentations and discussions will be held in strict confidence. Without the expressed permission of the speaker, nothing will be attributed directly or indirectly in the presence of anyone who was not authorized to hear or view the presentation. Unclassified information gained during lectures, briefings, presentations, and discussions may be used freely. However, neither the speaker nor any element of the Defense Nuclear Weapons School may be identified as the originator of the information without consent.

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DNWS FY 2022 Course Calendar

NUCLEAR WEAPONS ORIENTATION, POLICY AND SENIOR EXECUTIVE TRAINING

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
AWOC				4-6		1-3				26-28		
JNSEC						16-17						
NUPOL		(29 -3)		10-14		(28 -1)			(27 -1)			
NWOC	25-29	1-5					11-15	2-6 16-20	6-10		1-5 15-19	12-16
NWTIC		15-18		(31 -3)			4-7		6-9			
CNI	Course dates under review, check the DNWS Website											

NUCLEAR WEAPONS INCIDENT, ACCIDENT AND REPOSE TRAINING

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
NETOPS			6-17	3-14 (24)	7-18 (4)	(21 -1) (28 -11)	-1 11-22 (25 -6)	16-27	13-24		1-12	12-23
NWIRT-DB						15-17		17-19				13-15
NWIRT-DE	Course dates: by request											

CWMD RADIOLOGICAL AND NUCLEAR TRAINING

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
ARRT-2		15-19	6-10		14-18	21-25	25-29		20-24	25-29	8-12	19-23
B/IRNT		1-5 (29 -3)		24-28	22-25	(28 -1)	-1 11-15	23-27	6-10	18-22	22-26	
WSRHAC	Course dates: by request											

EXPLOSIVE ORDNANCE DISPOSAL SPECIALTY TRAINING

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
ADT-1		(29 -3)		24-28	(28 -4)		4-8	9-13	(27 -1) 11-15		15-19	
ADT-2			6-10	(31 -4)		7-11	11-15			18-22	22-26	
JNEODC			13-17		7-11	14-18	18-22			25-29	(29 -2)	
WREC	Course dates under review, check the DNWS Website											

(-) denotes class carried over one month to another



DNWS FY 2022 Partnered Course Calendar

PARTNERED - CBRNE MODELING SIMULATION												
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
FA-52 QC Phase1*							18-29		13-24			
GACA-1		(30 -3)					5-8				6-19	
GACA-2						15-18						
HANE						7-11						
HPAC-1			6-10	10-14			18-22	16-20		11-15	1-5	
HPAC-2-CBR		15-19				21-25						19-23
HPAC-N			13-17			7-11			6-10		22-26	
IMEA-1				24-28					6-10			
IMEA-2-C											8-12	
IMEA-N							4-8					
IWMDT-CA					7-11							12-16
IWMDT-CA-N									20-24			
JCPC	Contact the Registrar for the latest information.											
MAAC	Course dates under review, check the DNWS Website											
TNOC					7-11						8-12	
VAPO-1	4-8				7-11					25-29		
VAPO-2								2-6				
Location:												
<ul style="list-style-type: none"> • DTRA DNWS, Kirtland AFB, Albuquerque, NM • DTRA CBRNE M&S Training Center, Alexandria, VA • USSTRATCOM, Offutt AFB, NE 												
*Restricted course - registration request must go through the controlling agency												

GENERAL INFORMATION

DNWS FY 2022 MTT Course Calendar

NUCLEAR WEAPONS ORIENTATION, POLICY AND SENIOR EXECUTIVE TRAINING - MTT												
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
JNSEC												7/8
NWOC		15-19			14-18		18-21		20-24			
NWTIC											8-11	12-15

NUCLEAR WEAPONS INCIDENT, ACCIDENT AND REPOSE TRAINING - MTT												
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
NWIRT-DB	26-28	2-4				1-3	12-14	2-4 NCR		12-14 26-28	9-11 23-25	
NWIRT-DE	29	1				4		5 NCR		15 29	12 26	
NWIRT-OB	14-15		7-8									
NWIRT-OE			2-3									

Due to the uncertain operating environment at the time of printing, please check the DNWS website (<https://dnws.dtra.mil>) for the most recent information, or contact the DNWS registrar for specific requests.



Defense Threat Reduction Agency Defense Nuclear Weapons School

Quick Lookup

DNWS Registrar Office

Email: dtra.kirtland.ne.mbx.dnws-registrar@mail.mil

Phone: 505-846-5666 / **DSN:** 246-5666

Fax: 505-846-9168 / **DSN:** 246-9168

JPAS SMO Code: GQDD614

ATTN: DNWS Registrar, SSgt Ryan Edmonds

Website support

<https://dnws.dtra.mil>

(must connect via a .mil or .gov domain)

Email: dtra.kirtland.ne.list.dtra-dnws-it-support@mail.mil

Albuquerque Billeting Numbers

Kirtland AFB, Albuquerque, NM

AF INN: Phone 505-846-9653

DSN: 246-9653

<http://af.dodlodging.net/propertys/Kirtland-AFB>

FT Belvoir Billeting Numbers

Phone: 703-704-8600 or 1-800-295-9750

Computer Modeling

DTRA CBRNE Decision Support Analysis

Capabilities Training Support

Email:

dtra.belvoir.J9.mbx.reachback-training@mail.mil

jacqueline.a.shelton2.ctr@mail.mil

Phone: 571-303-2171 **Fax:** 571-303-2182

DTRA CBRNE M&S Training Center:

6361 Walker Lane, Suite C120

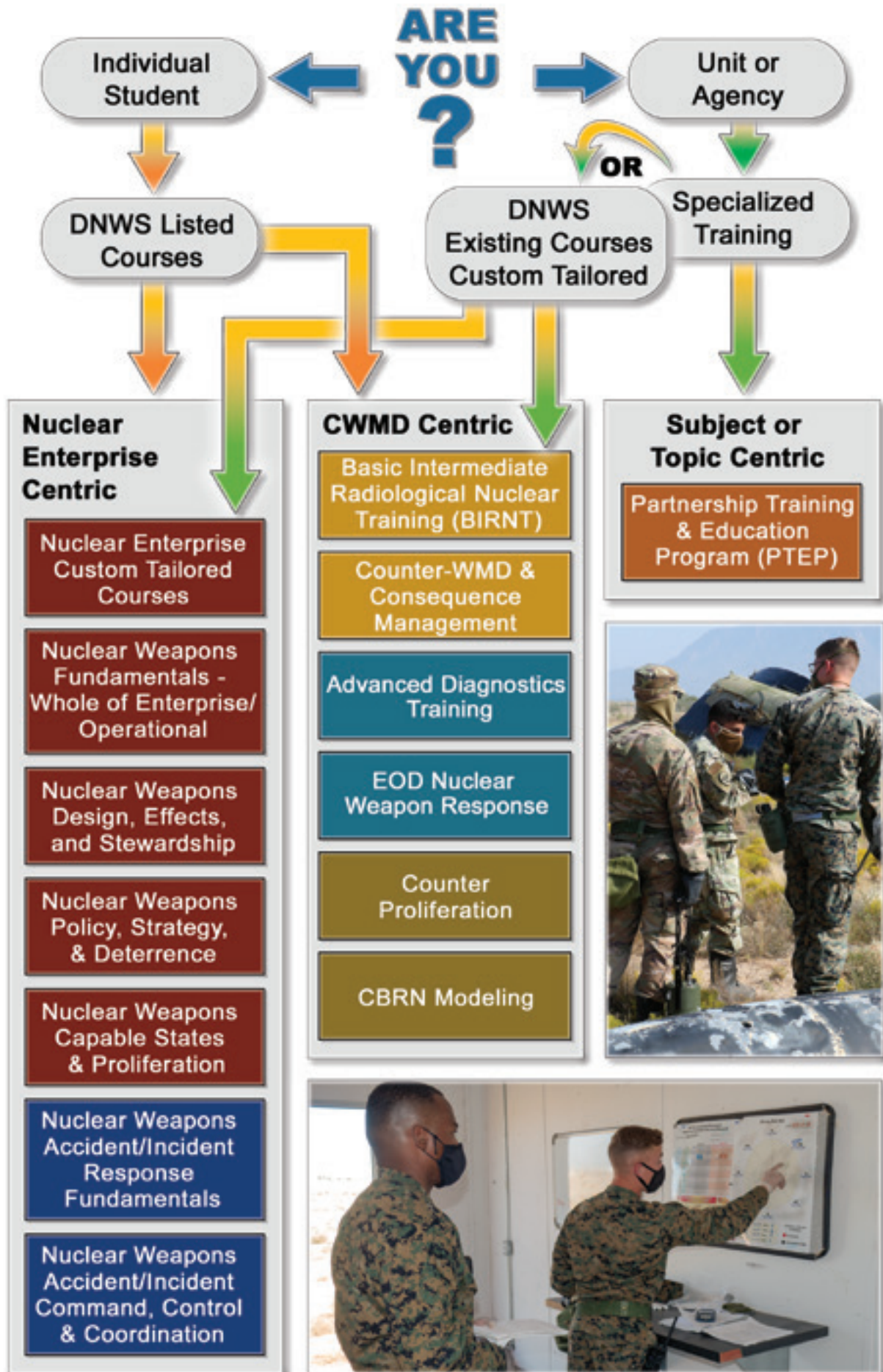
Alexandria, VA 22310

POC: COR Reachback Training CW4

Leonardo Cargill and CBRNE Training

Coordinator Ms. Jacqueline Shelton





Defense Nuclear Weapons School Field Training Sites

DNWS currently occupies approximately 2.5 acres on Kirtland AFB, which includes a classroom complex, the Nuclear Weapons Instructional Museum (NWIM) and a vehicle yard used for training rehearsals. The school also utilizes and maintains several other training sites to improve the training value of the courses. Since many of the school's courses include realistic, hands-on training, access to unique radiological training sources and field training sites is essential.

Thorium seeded training fields on Kirtland AFB have provided simulated contaminated crash sites for nuclear weapon accident response training since 1966. Each of the four sites has either vehicle or aircraft wreckage scattered across a wide area allowing students to train in a variety of scenarios in simulated contamination. These sites are a critical part of several courses and represent the DoD's only dedicated radiological contamination training sites.

DNWS has partnered with DTRA R&D to use the Technical Evaluation Assessment and Monitor Site (TEAMS), a local 18-acre site designed for the testing and evaluation of various detectors. The TEAMS test facility replicates realistic environments for search and characterization exercises. TEAMS has a shipping container yard with an integrated capability to seed radioactive sources in the soil; temporary office buildings, shipping container stacks, and subway and train cars to validate search techniques; and an "international village" to replicate a large, complex environment for survey and search training.

DNWS also maintains a unique underground facility with over 12,000 square feet of enclosed training space to replicate complex industrial facilities. The DNWS Advanced Radiological Training Site (DARTS), formerly the Advanced Research EMP Simulator (ARES) facility, was first used by DNWS as a training site in 2018 in support of a 20th CBRNE Command training request. Now an authorized training site, DNWS continues to develop, maintain, and manage DARTS for internal courses as well as CWMD-themed training and exercises for other units.

DNWS also has access to the Kirtland AFB Base Exercise Evaluation and Skills Training (BEEST) Area as a supplemental scenario training area. BEEST was originally built in the late 1950's as part of an auxiliary training airfield and later modified for blast overpressure studies. BEEST Area is part of the KAFB exercise branch and often used by the USAF Para-rescue School.

College Credit and Recognition for DNWS Courses



The American Council on Education (ACE) has recommended college credit for nine (9) DNWS courses, designated by the ACE logo in the respective course description. ACE is the major coordinating body for all of the nation's higher education institutions and provides a unifying voice on key higher education issues. The level of credit (undergraduate or graduate) and the number or recommended credit hours are listed in the adjacent table. DNWS has also partnered with the following colleges and universities to simplify credit transfers: Strayer University, SUNY Empire State College, Colorado Technical University, University of Maryland University College (UMUC), and National American University (NAU) Henley-Putnam School of Strategic Security.



For more than 30 years, colleges and universities have trusted ACE to provide reliable course equivalency information to facilitate their decisions to award academic credit. For more information, visit the website at <http://www.acenet.edu/news-room/Pages/The-ACE-CREDIT-College-and-University-Network.aspx>. Additionally, DNWS participates in the ACE CREDIT Transcript Service. The Transcript Service offers a lifelong record for students who have successfully completed DNWS courses that have been evaluated and recommended by ACE CREDIT. For more information, visit the ACE CREDIT Transcript Service website at <http://www.acenet.edu/higher-education/topics/Pages/Transcript-Services.aspx>.

DNWS has also received accreditation/certification from the Joint Staff and New Mexico Department of Public Safety for several courses. Courses with these accreditation/certifications will be designated by the respective logo in the course description. See page 9 for more details.



The Joint Staff (JCS) Certification

There are currently nine (9) DNWS courses that have joint certification. The Joint Staff Directorate for Joint Force Development (J7) certifies certain joint courses offered by DNWS for discretionary points toward Joint Qualified Officer (JQO) designation through the experience path of the Joint Qualification System (JQS). Students in the grades of O-1 through O-6 may self-nominate their experiences and submit course certificates to <https://milconnect.dmdc.osd.mil/milconnect/>. Select "Viewing Your Joint Officer History" to view

your status towards becoming a JQO, and to request award of joint experience points. This input will be reviewed by the proper Joint Officer Matters channels of the respective service branches to obtain JQS credit.

New Mexico Department of Public Safety (NMDPS) Accreditation

The New Mexico Department of Public Safety has accredited five (5) of our courses. These courses meet the requirements for the Continuing Education Program (CEP) for First Responders. Once students complete one or more of these classes, they may download a certification letter from the transcript page. Students must use this letter in conjunction with the certificate to receive credit from the NM DPS Training Center.



College/ACE Number	DNWS Course Name	Colorado Technical University	Empire State College - SUNY	University of Maryland University College	Strayer University	National American University
DTRA-0011	NWOC	3 SH/Upper Div	2 SH/Lower Div	2 SH/Lower Div	2 SH/Upper Div	4.5 QH/Lower Div
DTRA-0013	NUCPOL	4.5 SH/Upper Div	3 SH/Upper Div	2 SH/Upper Div	3 SH/Upper Div	4.5 QH/Graduate
DTRA-0017	NETOPS	9 SH/Upper Div	6 SH/Upper Div		6 SH/Upper Div	9 QH/Lower Div
DTRA-0019	NWOC MTT	3 SH/Upper Div	2 SH/Lower Div		2 SH/Upper Div	4.5 QH/Upper Div
DTRA-0020	ARRT-1	3 SH/Lower Div	3 SH/Upper Div		2 SH/Upper Div	3 QH/Upper Div
DTRA-0021	ARRT-2	4.5 SH/Upper Div	2 SH/Upper Div	2 SH/Upper Div	3 SH/Upper Div	4.5 QH/Upper Div
DTRA-0022	ADT-1		3 SH/Upper Div			4.5 QH/Lower Div
DNWS NR 201	ADT-2					4.5 QH/Upper Div
DNWS NR 250	JNEODC					4.5 QH/Upper Div

DNWS Training Certification Programs

The DNWS offers a variety of training certification programs to prepare personnel to perform specific functions associated with nuclear weapons, incident/accident response, incident command and control, security, and CBRN modeling. These certification programs are intended to raise professional standards and to recognize and document the achievement of those standards. In most cases, the certificates earned through the DNWS have no expiration date. Certification within a program demonstrates an individual's competency in a specific subject area within the DNWS. Training certifications pertaining to specific organizations are developed and managed in close coordination with the proponent organization and in accordance with their requirements.

Nuclear Response Certification Programs: The Nuclear Response Certification Programs is designed to develop the practical skills required for personnel to conduct an initial evaluation of an incident/accident environment. While appropriate for any personnel requiring skills to respond to a radiological hazard, the nuclear response certification program supports and integrates into the overall WMD-CST certification established by the National Guard Bureau (NGB). This program is not intended to replace any WMD-CST training otherwise established by the NGB.

- Basic Incident Response (BIR) Certificate (ARRT-2)
- Advanced Incident Response Certificate (BIR Certificate + NETOPS)

Nuclear Weapons Certification Programs: The Nuclear Weapons Certification Programs are designed for personnel with responsibilities in the Nuclear Enterprise, such as nuclear weapons policy, nuclear weapons operations, and nuclear weapons surety. These certifications would be particularly valuable for combatant command staff members, joint staff members, and personnel working in other components of the Nuclear Enterprise such as: nuclear weapons intelligence, nuclear weapons maintenance, nuclear weapons operations, and nuclear weapons security.

- Basic Nuclear Weapons Certificate (BRNIR or NWOC)
- Intermediate Nuclear Weapons Certificate (Basic Nuclear Weapons Certificate + NUCPOL)
- Advanced Nuclear Weapons Certificate – Operations (Intermediate Nuclear Weapons Certificate + TNOC)
- Advanced Nuclear Weapons Certificate – Surety (Intermediate Nuclear Weapons Certificate + JNSEC)

Nuclear Matters Certification Program: The Nuclear Matters Certification Program is designed for personnel with responsibilities in nuclear weapons stockpile management and stewardship. The purpose of this certification program is to provide the candidate with familiarization in nuclear weapons and radiological incident/accident response; past and current US nuclear policy; and basic Planning, Programming, Budget, and Execution (PPBE) and acquisitions.

- BRNIR or NWOC
- NucPol
- ACQ1010 or ACQ101

USAF Security Forces (SF) Nuclear Security Certification Training Program (NSCTP): NSCTP is designed for USAF SF personnel with responsibilities dealing with security of nuclear weapons. Level I certification is designed for SF nuclear security flight leadership such as flight chiefs, flight commanders, convoy commanders, flight security Officers, and similar personnel. Level II certification is designed for SF nuclear security group/squadron leadership such as group commanders, squadron commanders, SF operations officers, SF managers, SF operations superintendents, and similar personnel. Level III certification is designed for SF nuclear security policy personnel such as Air Staff, Headquarters Air Force Security Forces Center, MAJCOM, and Numbered Air Force nuclear security staff members and similar nuclear security policy personnel. To become NSCTP certified, you must complete the following collective courses appropriate to your duty position or assigned position.

- Level I, USAF SF Nuclear Flight Certification (NWOC)
- Level II, USAF SF Nuclear Group/Squadron Certification (Level I + NWTIC)
- Level III, USAF SF Nuclear Policy Certification (Level II + JNSEC)

Incident Command and Control Certification Program: The Incident Command and Control Certification Program is designed for personnel with command and control responsibilities in the event of an incident/accident involving WMD. This certificate is particularly valuable for combatant command staff members, joint task force staff members, or personnel working in similar capacities.

- Incident Command and Control Certificate (BRNIR + NWIRT)

EOD WMD Certification Program: The EOD WMD Certification Program is designed to develop the practical skills required for EOD personnel across DoD to respond to a nuclear weapons accident/incident as part of the Initial Response Force (IRF) and perform appropriate Phase 0 requirements based on Federal guidance, to include Presidential Policy Directives (PPD), and DoD regulations. While appropriate for all general support EOD personnel requiring skills to respond to a nuclear weapon accident and nuclear incident, the EOD WMD Certification Training Program supports and integrates into the overall whole-of-government accident/incident response structure. This program is not intended to replace any EOD WMD training otherwise established by the individual services.

- EOD WMD Certificate (ARRT-1 + ADT-1 + ADT-2 + JNEODC)



CBRN Modeling Certification Programs: The CBRN modeling certification programs are designed to recognize and document the completion of a comprehensive training program focused on specific hazard prediction modeling tools. This program is designed to support a wide audience that includes, but is not limited to WMD-CSTs; Consequence Management Advisory Teams (CMAT); Combatant Commands; and DoD, federal, state, and local emergency managers and planners. The following are the certification requirements for CBRN Modeling.

- Hazard Prediction and Assessment Capability (HPAC) Certificate (HPAC-1 + HPAC-2)
- Advanced CBRN Modeling Certificate (HPAC certificate + GACA)

Personnel who have completed the criteria for a certification program may apply for certificates through the DNWS Registrar. The entire sequence must be completed within three years of initial registration into the first course of the sequence. Upon proper completion of an application for certification, the individual will receive a DNWS Certificate of Training in the applicable certification program. For further details on these certificate programs, see <https://dnws.dtra.mil/>.



NUCLEAR WEAPONS ORIENTATION, POLICY AND SENIOR EXECUTIVE TRAINING

- **Advanced Weapons Operators Course (AWOC)**
- **Joint DOD-DOE Nuclear Surety Executive Course (JNSEC)**
- **Nuclear Policy Course (NUCPOL)**
- **Nuclear Weapons Orientation Course (NWOC)**
- **Nuclear Weapons Technical Inspections Course (NWTIC)**
- **Conventional Nuclear Integration (CNI) Series**

Due to the uncertain operating environment at the time of printing, please check the DNWS website (<https://dnws.dtra.mil>) for the most recent information, or contact the DNWS registrar for specific requests.



Advanced Weapons Operators Course (AWOC)

Course ID/Number: DNWS NW 112, USN S-140-0002

Course Prerequisites: NWOC or equivalent knowledge and/or experience

Classification: SECRET, **Security Requirements:** Restricted Data-CNWDI,

Uniform: As directed by the individual service for military & business casual for civilians.,

Format: In residence, **MTT:** N/A, **Course Length:** 3 days

AWOC is a 3-day course designed to educate the next generation of operators in nuclear deterrence and the capabilities of the U.S. Nuclear Enterprise. The course covers the components of the Nuclear Enterprise, the evolution of nuclear policy, and basic nuclear weapons design and effects. A Nuclear Weapons Instructional Museum (NWIM) tour at the S//RD-CNWDI level is also included.

Course Dates: Jan 4-6, Mar 1-3, Jul 26-28



Joint DOD-DOE Nuclear Surety Executive Course (JNSEC)

Course ID/Number: DNWS NW 201 & 201M,
USAF JBOZD32E1DOODA, USN S-140-0003

Course Prerequisites: N/A

Classification: SECRET, **Security Requirements:** Restricted Data-CNWDI,

Uniform: As directed by the individual service for military & business casual for civilians.,

Format: In residence, **MTT:** 1-day format only, NCR, **Course Length:** 1-day and 2-day formats available

JNSEC is an executive-level program offering an overview of safety, security, and C3 aspects of the U.S. nuclear weapons program. JNSEC is offered in two formats: a 1-day program conducted in the National Capitol Region (NCR), and a 2-day program conducted at the DNWS. A Nuclear Weapons Instructional Museum (NWIM) tour at the S//RD-CNWDI level is included in the 2-day format.

Course Dates: Mar 16-17, Sep 7/8





Nuclear Policy Course (NUCPOL)

Course ID/Number: DNWS NW 401, USN S-140-0005

Course Prerequisites: N/A

Classification: SECRET, **Security Requirements:** Restricted Data-CNWDI,

Uniform: As directed by the individual service for military & business casual for civilians.,

Format: In residence, **MTT:** N/A, **Course Length:** 5 days

NucPol is a 5-day course that provides an overview of U.S. nuclear weapons policy development including issues and challenges facing politicians today. It specifically covers the evolution of U.S. nuclear weapons policy, nuclear deterrence theory, applications of nuclear weapons within the instruments of national policy, factors influencing policy, foreign nation nuclear weapons drivers, and proliferation concerns.

A policy-focused tour of the Nuclear Weapons Instructional Museum (NWIM) at the S//RD-CNWDI, level is included.

Course Dates: Nov 29 - Dec 3, Jan 10-14, Mar 28 - Apr 1, Jun 27 - Jul 1



Nuclear Weapons Orientation Course (NWOC)

Course ID/Number: DNWS NW 110 & NW 110M, USA-ROO1, USAF-JBOZD21A100DA, USMC-FO4EGP1, USN S-140-0001

Course Prerequisites: N/A

Classification: SECRET, **Security Requirements:** Restricted Data-CNWDI,

Uniform: As directed by the individual service for military & business casual for civilians.,

Format: In residence, **MTT:** Upon request, **Course Length:** 4.5 days

NWOC is a 4.5-day course that provides an overview of the history and development of nuclear weapons, management of the U.S. nuclear stockpile, and the issues and challenges facing the program. NWOC focuses on four functional areas: nuclear weapons fundamentals, nuclear weapons effects, nuclear weapons stockpile, and foreign nuclear weapons capabilities and proliferation. A Nuclear Weapons Instructional Museum (NWIM) tour at the S//RD level is included.



Course Dates: Oct 25-29, Nov 1-5, Apr 11-15, May 2-6, May 16-20, Jun 6-10, Aug 1-5, Aug 15-19, Sep 12-16



Nuclear Weapons Technical Inspections Course (NWTIC)

Course ID/Number: DNWS P 120

Course Prerequisites: DNWS DL Course NW104DL: Nuclear Weapon Surety (NWS)

Classification: SECRET, **Security Requirements:** Restricted Data-CNWDI,

Uniform: As directed by the individual service for military & business casual for civilians.,

Format: In residence, **MTT:** Yes, specified dates and upon request, **Course Length:** 4 days

NWTIC is a 4-day course that provides instruction on common inspection methodology to better baseline and educate Service Inspectors for the Nuclear Enterprise. The course will use lectures, facilitated group discussions, and inspection scenarios to ensure strict and consistent application of nuclear weapon technical inspection guidance.

Course Dates: Nov 15-18, Jan 31 - Feb 3, Apr 4-7, Jun 6-9



Conventional Nuclear Integration (CNI) Series

The Conventional Nuclear Integration (CNI) series is tailored to three specific audiences within a Combatant Command or supporting command: senior leaders, senior staff and advisors, and operational/planning staff members. Each seminar and course provides an overview of CNI topics and discusses the importance of the nation's CNI effort, as well as other concerns specific to the AOR. Additionally, all practical exercises and scenarios are specific to the audiences' AOR. Details for each variant are included below.

**Course Dates are not listed due to the uncertain operating environment at the time of printing. Please check the DNWS website (<https://dnws.dtra.mil>) for the most recent information, or contact the registrar specific requests.

CNI Executive Seminar (CNIES)

Course ID/Number: Upon Request

Course Prerequisites: N/A

Classification: SECRET, **Security Requirements:** Restricted Data//NOFORN, **Uniform:** As directed by the individual service for military & business casual for civilians, **Format:** In residence, **MTT:** Upon request, **Course Length:** 1 hour

CNIES is a 1 hour executive-level seminar that includes the overview of CNI and a brief description of nuclear weapons effects that are of concern in the CNI environment. This seminar is designed for senior leaders within Combatant Command and supporting command staffs.

CNI Orientation Seminar (CNIOS)

Course ID/Number: Upon Request

Course Prerequisites: N/A

Classification: SECRET, **Security Requirements:** Restricted Data//NOFORN, **Uniform:** As directed by the individual service for military & business casual for civilians, **Format:** In residence, **MTT:** Upon request, **Course Length:** 4 hours

CNIOS is a 4 hour seminar that includes the overview of CNI and discussions on U.S. Nuclear Policy, adversary concerns, nuclear weapons effects, and impacts of the "nuclear battlefield." This seminar is designed for members of Combatant Command and supporting command staffs in the rank of E-8, and O-5 and above.



CNI Planners Awareness Course (CNIPAC)

Course ID/Number: Upon Request

Course Prerequisites: N/A

Classification: SECRET, **Security Requirements:** Restricted Data//NOFORN, **Uniform:** As directed by the individual service for military & business casual for civilians, **Format:** In residence, **MTT:** Upon request, **Course Length:** 3 days

CNIPAC is a 3 day course designed to present a preparatory level of knowledge applicable to the various staff functions responsible for developing operational plans. The course will allow the staff to examine how a nuclear environment will influence conventional operations in order to build force resiliency, survivability and readiness. Additionally, it will discuss CNI concepts, nuclear weapons effects, and current CNI policy. At the end of the course, students will apply what they have learned and deliver a presentation to demonstrate their knowledge of CNI concepts. This course is designed for operational and planning staffs within Combatant Commands and supporting commands in the rank of E-7, O-4 and above.



NUCLEAR WEAPONS INCIDENT, ACCIDENT AND RESPONSE TRAINING

- **Nuclear Emergency Team Operations (NETOPS)**
- **Nuclear Weapons Incident Response Training, Domestic Basic (NWIRT-DB)**
- **Nuclear Weapons Incident Response Training, Domestic Executive (NWIRT-DE)**
- **Nuclear Weapons Incident Response Training, Overseas Basic (NWIRT-OB)**
- **Nuclear Weapons Incident Response Training, Overseas Executive (NWIRT-OE)**

Due to the uncertain operating environment at the time of printing, please check the DNWS website (<https://dnws.dtra.mil>) for the most recent information, or contact the DNWS registrar for specific requests.



Nuclear Emergency Team Operations (NETOPS)

Course ID/Number: DNWS NR 101, USMC F045781, USN S-140-0009, USA DNWS-R038, USAF J5OZD32E3G00DA, NM DPS NM170289

Course Prerequisites: N/A

Classification: UNCLASSIFIED, **Security Requirements:** None, **Uniform:** Service Utility Uniform for military & casual for civilians, **Format:** In residence, **MTT:** N/A

Course Length: 10 days

NETOPS is a 10-day hands-on course which provides nuclear weapons accident response operations training to joint service responders. The course provides instruction on basic nuclear physics, biological effects of radiation, response processes and capabilities, radiation detection equipment, contamination control stations, surveys, and command and control. The course culminates with three field training exercises during which students don complete sets of anti-contamination clothing, use RADIAC equipment, and perform realistic nuclear emergency team functions at DNWS live radioactive training sites. Military personnel from all branches and Federal employees occupying EOD, CBRN defense specialties and career fields, or other emergency response force positions are welcome to attend.

Course Dates: Dec 6-17, Jan 3-14, Jan 24 - Feb 4, Feb 7-18, Feb 28 - Mar 11, Mar 21 - Apr 1, Apr 11-22, Apr 25 - May 6, May 16-27, Jun 13-24, Aug 1-12, Sep 12-23



Nuclear Weapons Incident Response Training (NWIRT) Series

The Nuclear Weapons Incident Response Training (NWIRT) series is tailored to four specific audiences and operating environments: domestic basic, domestic executive, overseas basic and overseas executive. The course reviews the following topics: the roles and responsibilities of the DoD during a nuclear weapon incident as mandated by national policy; response by other Federal departments or agencies, including DHS, FBI, and DOE; and legal and public affairs issues specific to a U.S. nuclear weapon incident. Each topic and module is presented by an interagency expert in an academic format. Details and course numbers for each variant are included below.

****Course Dates are not listed due to the uncertain operating environment at the time of printing. Please check the DNWS website (<https://dnws.dtra.mil>) for the most recent information, or contact the registrar or course manager for specific requests.**



Nuclear Weapons Incident Response Training, Domestic Basic (NWIRT-DB) Course

Course ID/Number: DNWS NR 210-DB, USMC F04B0Z1, USN S-140-0010, USAF J5OZD13B402DA, USA DNWS-R003

Course Prerequisites: N/A

Classification: UNCLASSIFIED (S//FRD level upon specific request), **Security Requirements:** None, **Uniform:** As directed by the individual service for military & business casual for civilians, **Format:** In residence, **MTT:** Upon request, **Course Length:** 3 days

NWIRT-DB is a 3-day course designed for Initial Response Force (IRF) and Response Task Force (RTF) Commanders and staff, addressing issues specific to a domestic nuclear weapon incident.



Nuclear Weapons Incident Response Training, Domestic Executive (NWIRT-DE) Course

Course ID/Number: DNWS NR 210-DE, USMC F04B0Z1, USN S-140-0010, USA DNWS-R003, USAF J5OZD13B402DA

Course Prerequisites: N/A

Classification: UNCLASSIFIED, **Security Requirements:** None, **Uniform:** As directed by the individual service for military & business casual for civilians, **Format:** In residence, **MTT:** Upon request, **Course Length:** 1 day

NWIRT-DE is a 1-day executive-level course designed for IRT, IRF, and RTF senior leaders, GCC and MAJCOM staff members, addressing issues specific to a domestic nuclear weapon incident.



Nuclear Weapons Incident Response Training, Overseas Basic (NWIRT-OB) Course

Course ID/Number: DNWS NR 210-OB, USMC F04B0Z1, USN S-140-0010, USA DNWS R003, USAF J5OZD13B402DA

Course Prerequisites: N/A

Classification: SECRET, **Security Requirements:** FRD//NATO, **Uniform:** As directed by the individual service for military & business casual for civilians, **Format:** In residence, **MTT:** Upon request, **Course Length:** 2 days

NWIRT-OB is a U.S. Only, classified 2-day course designed for IRF and RTF Commanders and staff, addressing issues specific to a nuclear weapon incident overseas. The course is presented via MTT, and specifically in the EUCOM AOR twice per fiscal year.



Nuclear Weapons Incident Response Training, Overseas Executive (NWIRT-OE) Course

Course ID/Number: DNWS NR 210-OE, USMC F04B0Z1, USN S-140-0010, USA DNWS R003, USAF J5OZD13B402DA, **Course Prerequisites:** N/A

Classification: SECRET, **Security Requirements:** FRD//NATO//ACCM,

Uniform: As directed by the individual service for military & business casual for civilians,

MTT: Upon request, **Course Length:** 1 day

NWIRT-OE is a U.S. Only, classified 1-day course for IRT, IRF and RTF senior leaders, GCC and MAJCOM staff, addressing issues specific to a nuclear weapon incident overseas. The course is presented via MTT, and specifically in the EUCOM AOR once per fiscal year.



Nuclear Weapons Instructional Museum

DNWS manages and operates the only classified Nuclear Weapons Instructional Museum (NWIM) in DoD. The NWIM is an irreplaceable repository that traces the history and development of the U.S. nuclear weapons stockpile from its inception to the present. The NWIM contains displays of all stockpiled U.S. nuclear weapons and their associated components and delivery systems, as well as related training aids.



In addition to preserving artifacts of unique historic significance, the DNWS NWIM serves as an important teaching aid. Tours are provided in conjunction with some courses conducted at the DNWS and vary in length from two to four hours, depending on the nature of the audience. Touring the NWIM display affords students and visitors a rare opportunity to view exhibits and to discuss stockpile issues with experienced instructors.

The NWIM has two major components:

1. An unclassified area where visitors may view a number of different weapon casings and a display of one-tenth scale foreign missile delivery systems.
2. A classified area displaying detailed nuclear weapon models. Arrangements can be made for groups and visitors to tour the NWIM on Tuesdays, Wednesdays, and Thursdays only; Mondays and Fridays the museum is closed to tours for maintenance and upkeep operations. Tours are available for anyone who meets security clearance requirements, has a need-to-know, and submits the required paperwork in accordance with school policy. A DoD SECRET security clearance with Restricted Data or Critical Nuclear Weapons Design Information access or a Department of Energy "Q" clearance is required to participate in an NWIM tour. To reserve a special tour of the NWIM, a written request must be submitted to and received a minimum of 15 working days before the requested tour date. Download a sample NWIM tour request letter or use the template on the following catalog page. Requests may be emailed to dtra.kirtland.ne.mbx.dnws-nwim@mail.mil <<mailto:dtra.kirtland.ne.mbx.dnws-nwim@mail.mil>> or faxed to 505-846-5560.

The NWIM is a member of the American Alliance of Museums.

For all tours of the Nuclear Weapons Instructional Museum (NWIM), please contact the NWIM Scheduler at: (505) 853-2157 or FAX: (505) 846-5560



DNWS Tour Request Procedures

The following actions are required to request and book a tour of the NWIM:

1. All tour attendees requesting entry into the classified Weapons Display Area (WDA) must possess Restricted Data (RD) and Controlled Nuclear Weapons Design Information (CNWDI) caveats on their security clearances. Please note that these caveats are not automatically included in a Secret or Top Secret clearance and require read-in by the owning organization to these respective programs if the personnel have a need to know. Personnel will not be read into RD and CNWDI by DNWS.
2. Please contact the NWIM Scheduler via email at dtra.kirtland.ne.mbx.dnws-nwim@mail.mil or via telephone at DSN 246-7958 or Commercial (505) 846-7958. Once you have received an acknowledgement and a draft Access Roster from the NWIM Scheduler you may proceed to the next step.
3. All organizations must download and return the NWIM Access Roster ASAP. The clearance information included on the Access Roster will be validated by the NWIM Scheduler, not your local Security Office/Manager. Changes to the roster can be made up to 15 days prior to visit. Deletions may be made at any time. No additions will be accepted within 15 days of the visit. The Access Roster can either be emailed to dtra.kirtland.ne.mbx.dnws-nwim@mail.mil or faxed. If faxed, please send to 505-846-5560.
 - A. DOE INSTRUCTIONS: DOE Personnel must have their security/badging office submit a DOE Form 5631.20 signed by their applicable security personnel and submitted either to the dnws.dtra.mil website under the 'Upload VAR Attachment' menu option or faxed to 505-846-5560. Members who fail to submit a signed and completed DOE Form 5631.20 will not be allowed entry into the NWIM. DOE personnel do NOT have to include SSN information on the roster as we cannot receive encrypted emails from most DOE organizations. If a tour attendee believes that they have a long term visit request on file, please notify the NWIM Scheduler (dtra.kirtland.ne.mbx.dnws-nwim@mail.mil) for clearance validation. DOE personnel must annotate "RD and CNWDI" in the DOE Form 5631.20 section labeled "Specific information to which access is requested" and both boxes in the next section labeled "Access is requested to" must be checked "Yes".
 - B. DOD INSTRUCTIONS: DOD organizations will submit a visit request in DISS with the following information:
 - (1) SMO Code: GQDD614
 - (2) POC for DISS: TSgt Saavedra
4. The following items are not permitted in NWIM:
 - A. Backpacks/purses of any kind (storage area available outside the NWIM)
 - B. Food or drinks
 - C. Cell phones
 - D. Bluetooth devices
 - E. Smart watches
 - F. Any item with a data port (including pedometers)
 - G. Any automobile key fobs with two way data transmission capability

You may leave these items in your vehicle or in the case of line items C-F, leave them in unsecured cubbies at the entrance to the facility.





CWMD Radiological and Nuclear Training

- **Basic Intermediate Radiological Nuclear Training (B/IRNT)**
- **Applied Radiological Response Techniques Level 2 (ARRT-2)**
- **WMD Site Recon and Hazard Awareness Course (WSRHA)**

Due to the uncertain operating environment at the time of printing, please check the DNWS website (<https://dnws.dtra.mil>) for the most recent information, or contact the DNWS registrar for specific requests.



Basic Intermediate Radiological Nuclear Training (B/IRNT)

Course ID/Number: DNWS CW 100

Course Prerequisites: N/A

Classification: UNCLASSIFIED, **Security Requirements:** None, **Uniform:** Service Utility or civilian equivalent, **Format:** In residence, **MTT:** Upon Request, **Course Length:** 2-5 days



B/IRNT is a tailorable, 2-5 day course, designed for unit training, suitable for in-residence or MTT delivery. Target audiences include Active Duty, Reserve, and National Guard Bureau units with a WMD or CBRN-specific mission (DCRF, CST, CRT, CRD and DRT as well as other DOD CBRN mission units). Along with the focus on DoD-NGB CBRN force, some domestic response courses can incorporate other federal, state and local responders as appropriate for the request class. At the request of the DOD CBRN leads in theater, some classes can be run with foreign partners as well, this is on a case by case, please contact the course manager for more information.

B/IRNT is built around a core set of lesson modules and uses elective lesson modules to customize the class for the unit's radiological and nuclear mission focus. This core module focus on principles of radiological detection, identification, and decontamination. Electives in nuclear fuel cycle, nuclear reactors and reactor accidents, and nuclear weapons effects are customizable based upon unit mission requirements. Instructional modules are reinforced with hands-on and/or field training.

Core Modules for the B/IRNT:

- Radiological Fundamentals
- Managing Radiological Exposure
- Detector Theory
- Detector Laboratory
- Personal Protective Equipment and Radiological Decontamination
- Radiological Materials of Concern
- Nuclear Materials of Concern

Current Elective Modules Available for the B/IRNT:

- Detector Specific Overviews (Unit/Agency Tailored)
- Radiological Search Techniques
- Gamma Spectroscopy
- Radiological Terrorism
- Nuclear Terrorism
- EMP & HEMP Overview
- Nuclear Battlefield
- Aircraft and Vehicle Decontamination
- SNM Hazards
- Reactor Overview
- Reactor Accidents
- Operation TOMODACHI Lessons Learned
- Nuclear Fuel Cycle
- Tuwaitha Site Exploitation Lessons Learned
- Risk Communication
- Psychological Effects of Radiation



Additional or advanced modules developed upon request.

Course Dates: Nov 1-5, Nov 29 - Dec 3, Jan 24-28, Feb 22-25, Mar 28 - Apr 1, Apr 11-15, May 23-27, Jun 6-10, Jul 18-22, Aug 22-26, or by request (call for scheduling)



Applied Radiological Response Techniques Level 2 (ARRT-2)

Course ID/Number: DNWS NR401, USN S-140-0013, USA DNWS RO27, NM DPS NM170288

Course Prerequisites: ARRT-1

Classification: UNCLASSIFIED, **Security Requirements:** None,
Uniform: Service utility uniform with winter support for FTX portion,
Format: In residence, **MTT:** N/A, **Course Length:** 5 days

ARRT-2 is 5-day course designed to apply the theories learned in ARRT-1, with the focus on applied radiological problem solving methods. Approximately 20 percent of the course is conducted in detector laboratories while the remaining course time is dedicated to hands-on radiological experiences and the interpretation of survey data. Attendees should bring appropriate dress for outdoor activities for the given season.

Course Dates: Nov 15-19, Dec 6-10, Feb 14-18, Mar 21-25,
Apr 25-29, Jun 20-24, Jul 25-29, Aug 8-12, Sep 19-23





WMD Site Recon and Hazard Awareness Course (WSRHA)

Course ID/Number: DNWS CW 200

Course Prerequisites: N/A

Classification: UNCLASSIFIED, **Security Requirements:** None,
Uniform: Service Utility or civilian equivalent, **Format:** In residence,
MTT: Upon request, **Course Length:** 2-3 days

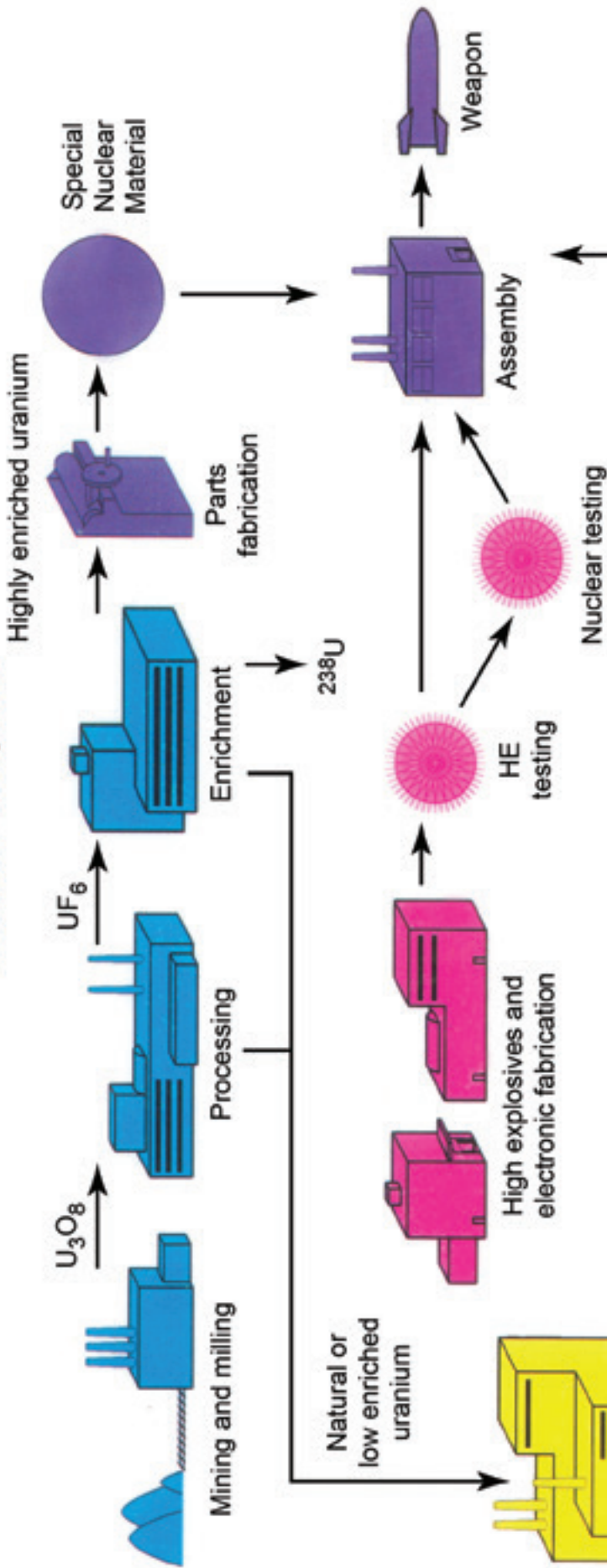
The WSRHA is a 2-3-day course that provides a familiarization of nuclear fuel cycle infrastructure and emphasizes force protection requirements for units assigned (or have the potential for assignment) to conduct reconnaissance where such infrastructure may exist. The course covers site specific hazards associated with a nation-state's weapons program; the mechanics of the material process; and key identification features associated with these production facilities. A table-top exercise (TTX) of a scaled WMD Site reconnaissance mission can be included upon request.

Course Dates: Upon request

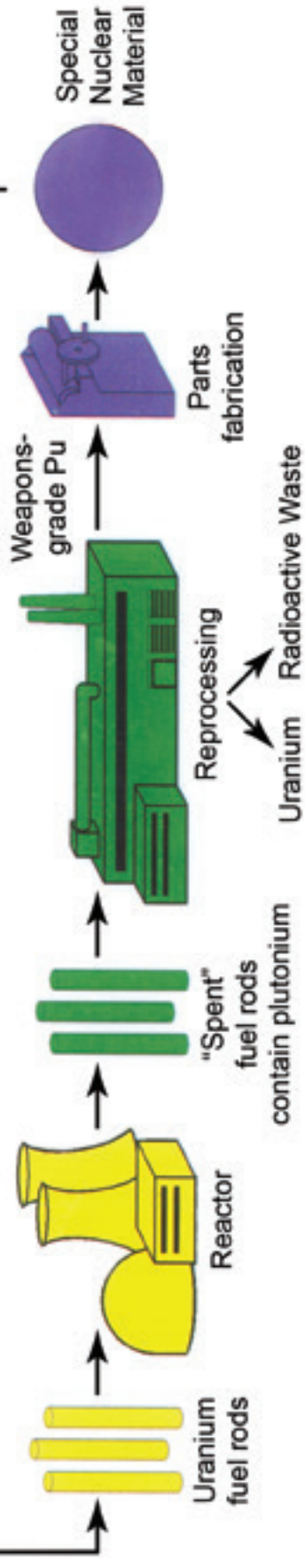


Nuclear Weapons Facilities

Uranium Weapons



Plutonium Weapons







EXPLOSIVE ORDNANCE DISPOSAL SPECIALTY TRAINING

- **Advanced Diagnostic Training 1 (ADT-1)**
- **Advanced Diagnostic Training 2 (ADT-2)**
- **Joint Nuclear Explosive Ordnance Disposal Course (JNEODC)**
- **Weapon Recovery EOD Course (WREC)**

Due to the uncertain operating environment at the time of printing, please check the DNWS website (<https://dnws.dtra.mil>) for the most recent information, or contact the DNWS registrar for specific requests.



Advanced Diagnostic Training 1 (ADT-1)

Course ID/Number: USA DNWS ED 300, USAF-E J5AAD3E851 0A1A, USAF-O J50AD32E3G 0A1A, USMC F04PXV1, S-431-8288, DPS NM190339

Course Prerequisites: N/A

Classification: UNCLASSIFIED, **Security Requirements:** CUI, **Uniform:** Service Utility uniform and casual for civilians. Participants should bring M-53 masks, if able. Portions of the class are administered outdoors. Appropriate inclement weather and sun protective clothing is recommended, **Format:** In residence, **MTT:** Upon request, **Course Length:** 5 days

ADT-1 is a 5-day course of instruction that focuses on WMD threat awareness, inter-agency policy, national response architecture, nuclear science, radiation detector theory, and crisis communications. The target audiences are those who current work as, or may support, designated US Government CWMD authorities. This course meets interagency standards for national crisis response, and is recognized by both the FBI and NNSA Stabilization (STAB) programs.



Course Dates: Nov29 - Dec 3, Jan 24-28, Feb 28 - Mar 4, Apr 4-8, May 9-13, Jun 27 - Jul 1, Jul 11-15, Aug 15-19



Advanced Diagnostic Training 2 (ADT-2)

Course ID/Number: DNWS ED 301, USA DNWS-NR-201, USAF-E J5AAD3E851 0A2A, USAF-O J50AD32E3G 0A2A, USMC F04PXZ1

Course Prerequisites: ADT-1

Classification: SECRET, **Security Requirements:** Restricted Data-CNWDI, **Uniform:** Service Utility Uniform. Participants should bring M-53 masks, if able. Portions of the class are administered outdoors. Appropriate inclement weather and sun protective clothing is recommended, **Format:** In residence, **MTT:** Upon request, **Course Length:** 5 days

ADT-2 is 5-day course for EOD Technicians that focuses on WMD "Threat Assessment" to apply design concepts to differentiate between material of concern and an Item of Primary Concern, TTPs and communication methods. This course meets interagency standards for national crisis response, and is recognized by both the FBI and NNSA Stabilization (STAB) programs.



Course Dates: Dec 6-10, Jan 31 - Feb 4, Mar 7-11, Apr 11-15, Jul 18-22, Aug 22-26



Joint Nuclear Explosive Ordnance Disposal Course (JNEODC)

Course ID/Number: DNWS ED 250, USA DNWS-R006, USAF J5AZ03E871 00DA, USN S-140-0011, USMC F04L2Y1

Course Prerequisites: N/A

Classification: SECRET, **Security Requirements:** Restricted Data-CNWDI, **Uniform:** Service Utility Uniform. Participants should bring M-53 masks, if able. Portions of the class are administered outdoors. Appropriate inclement weather and sun protective clothing is recommended, **Format:** In residence, **MTT:** N/A, **Course Length:** 5 days

JNEODC is a 5-day course that provides detailed sustainment training for EOD technicians when responding to Nuclear Weapons Accidents or Incidents (NWA) as part of the Initial Response Force (IRF). The program focuses on nuclear weapons hazards, stockpile safety features and safeguards, weapons development, and response protocols. Portions of this course are taught by SMEs at the Sandia National Laboratory.

Course Dates: Dec 3-17, Feb 7-11 Mar 14-18, Apr 18-22, Jul 25-29, Aug 29 - Sep 2

Deadline for registration is 21 days prior to the class convene date.



Weapon Recovery EOD Course (WREC)

Course ID/Number: DNWS ED 400

Course Pre-requisites: N/A

Classification: SECRET, **Security Requirements:** Restricted Data-CNWDI

Uniform: Service Utility Uniform. Participants should bring M-53 masks, if able. Portions of the class are administered outdoors. Appropriate inclement weather and sun protective clothing is recommended, **Format:** In residence, **MTT:** N/A,

Course Length: 20 hours (2.5 days)

WREC is a 20-hour course intended for custodial/Direct Support Unit (DSU) EOD personnel to familiarize responders with weapon recovery planning. This planning introduction includes policy overview, the personnel and equipment deployed by DoD, DOE, and DOJ, and interagency Standard Operating Procedures (SOPs) in response to a domestic or international Nuclear Weapons Accidents or Incidents (NWI).

Course Dates: Upon request







SPECIALIZED TRAINING

- **Partnership Training and Education Program (PTEP)**

Due to the uncertain operating environment at the time of printing, please check the DNWS website (<https://dnws.dtra.mil>) for the most recent information, or contact the DNWS registrar for specific requests.



Partnership Training & Education Program (PTEP)

PTEP is an integral part of DTRA's mission to support the Nuclear Enterprise & CWMD community by providing specialized training and education to meet Combatant Commander and Interagency Partner academic requirements. PTEP has access to instructors and SMEs who can custom tailor curricula to include lessons learned and best practices across the full spectrum of Radiological, Nuclear, and related CWMD topics. Specialized training and education priorities and focus include:

- Combat support missions (e.g., support to GCCs, component schools, and joint university)
- Partnership collaboration (e.g., Interagency, academic, and international seminars)
- Facilitating innovation (e.g., Radiological detector developments and applications; Radiological and Nuclear site capability expansion)
- Empowering leadership (e.g., Radiological & Nuclear site visits and instruction; information sharing)



Please contact the PTEP team for further information:

Program Manager

Mr. Chris Pink

Lead Instructors

Mr. Chikiyo Jackson

Mr. Steve Zynda

Mr. Randy Stover

For more information on the Partnership Training and Education Program or to request training, please call the Partnership team at
(505) 846-6254 / (505) 846-1193 / (505) 853-0195 / (505) 853-7390

PTEP topic areas for tailored seminars, electives, and training iterations include, but are not limited to:

- WMD/CBRNE, Radiological, & Nuclear Terrorism
- Radiological & Nuclear (SNM Focus) Materials of Concern
- EMP/HEMP Comparison for Responders
- Nuclear Reactors & Nuclear Reactor Accidents
- Radiological & Nuclear Cargo Hazards
- Survival on a Nuclear Battlefield
- Radiological & Nuclear Decontamination
- Nuclear Weapons Design and Design Evolution
- Operation TOMODACHI Lessons Learned
- Tuwaitha – Iraq Survey Group Case Study
- Minot to Barksdale Overview and Lessons Learned
- Legacy and Current U.S. Nuclear Weapons Stockpile



Here are two current PTEP tailored courses:

- U.S. Legacy & Current Nuclear Stockpile Seminar -- A classified seminar covering the United States legacy and current nuclear weapons stockpile, with a focus on weapons accountability, handling, and deployment. This 3-day SECRET//RD-CNWDI seminar is available once a year upon request. Due to the specialized nature of the seminar, participation is limited to 35 attendees.
- CWMD Radiological/Nuclear Operational Seminar (CRNOS) -- This seminar provides Operational Staff level awareness of the Radiological and Nuclear Operational environment as it relates to CWMD efforts. The 4-day seminar addresses the following topics and evolutions:
 - An overview of radiological and nuclear materials, categorization and equipment
 - An overview of RED, RDD and IND threats
 - Operational considerations concerning the medical effects of ionizing radiation
 - U.S. CWMD policies and capabilities as they apply to radiological and nuclear threats
 - CWMD/IND focused classified tour of the Nuclear Weapons Instructional Museum (NWIM)
 - Visits and discussions with Rad/Nuc event response stakeholders
 - Hands on exposure to radiological sources and the entire spectrum of DOD radiological detectors

CRNOS is a 4-day seminar conducted at the TOP SECRET//SCI/RD-CNWDI classification. The target audience is TSOC, GCC and operational staff personnel participating in CWMD efforts. The seminar is conducted twice a year. An additional iteration can be conducted as required. Due to the hands-on nature of the seminar, participation is limited to 25 attendees.



Connecting Today's Operational Forces to our Shared Nuclear History & Heritage

The PTEP program also actively supports the rich DTRA-DNWS history by connecting lessons learned with current training for today's leaders, responders and the warfighters in classes, site visits, and museum tours.

PTEP advocates Knowledge Preservation through interviews, research, and analysis in conjunction with the DTRIAC, nuclear veterans, and the National Labs.



The PTEP team also provides legacy, operational, and training site visits, connecting today's DOD and Interagency personnel.

Example site visits include: EMP Trestle/DARTS (Formerly ARES), Underground Facility tour, B-29 Crash Site, DNWS training areas, and the Trinity site.



PTEP helps facilitate foreign partner engagements at DNWS, sharing lessons learned and best practices, which directly supports the GCC's Theater Security Cooperation Program (TSCP) outreach programs.



DISTANCE LEARNING TRAINING

- **Applied Radiological Response Techniques – Level 1 (ARRT-1) Modules**
- **Basic Science Skills (BSS) Modules**
- **Basics for Radiological – Nuclear Incident Response (BRNIR)**
- **Joint Nuclear Weapons Publications System (JNWPS)**
- **Nuclear Safety Studies and Review (NSSR)**
- **Nuclear Weapons Surety (NWS)**
- **Personnel Reliability Assurance Program (PRAP)**

The school currently offers online training content on two platforms, on the DNWS Learning Content Management System (LCMS) and on the Joint Knowledge Online (JKO) Learning Management System (LMS).

Using DNWS LCMS: Navigate to <https://dnws.dtra.mil>. Login using your CAC. Click on the "Training Courses" link on the DNWS Home Page. Available courses will display in the list.

Using JKO LMS: Navigate to <https://jko.jten.mil/>. Login using your CAC or JKO login credentials. Conduct a course catalog search for the following "prefix": DNWS. Apply the Search. Available DNWS courses will display in the list.

Note: The user must create/register for a student account on either of the above sites.



Applied Radiological Response Techniques - Level 1 (ARRT-1) Modules

DNWS Course Number: DNWS NR 200 DL, USA DNWS-R027, DPS NM 200339, DTRA-0020

JKO Course Number: DNWS-AD01-AD08

Course Prerequisites: Basic Scientific Skills Modules and Nuclear Weapons Surety (NWS)

Classification: UNCLASSIFIED, **Security Requirements:** None,

Course Length: 16 hours, self-paced

ARRT-1 is an awareness-level course that provides instruction on basic radiological response techniques. This course is based on a series of modules that cover the following: Basic Radiation Science, Characteristics of Radiation, Radiation Units of Measure, Gas Filled Detectors, Solid State Detectors, Radiation Exposure Control, Radiological Contamination Control, and Radiological Survey Planning.



Basic Science Skills (BSS) Modules

DNWS Course Number: DNWS HP 080 DL

JKO Course Number: DNWS-HD01-HD05

Course Prerequisites: None

Classification: UNCLASSIFIED

Security Requirements: None

Course Length: 5 modules approximately 30 min each (total 2.5 hours), self-paced

Basic Science Skills comprises five stand-alone modules that can be completed in sequence or individually, as the student or in-residence course manager sees fit. This online series is considered a prerequisite/refresher in the fundamentals of the basic sciences as they relate to the Nuclear Enterprise.

Note: BSS Modules 2-3 expected availability date is Oct 2020



Basics for Radiological - Nuclear Incident Response (BRNIR)

Course ID/Number: DNWS NR 100 DL

JKO Course Number: DNWS BD-01 through DNWS BD-12

Note: BD-12 is a series exam; each module has its own exam.

Course Prerequisites: N/A

Classification: UNCLASSIFIED, **Security Requirements:** None

Course Length: 24 hours, self-paced

BRNIR is an awareness-level course that provides instruction on basic radiation science; fundamentals of nuclear weapons and radiological dispersal devices; radiological terrorism; medical and psychological effects of radiation exposure; radiation hazards, detection equipment, personal protective equipment, and decontamination; and Federal incident response.





Joint Nuclear Weapons Publications System (JNWPS)

DNWS Course Number: DNWS NS 105 DL
JKO Course Number: DNWS ID-01
Course Prerequisites: N/A
Classification: UNCLASSIFIED
Security Requirements: None
Course Length: 4 hours, self-paced

JNWPS is an awareness level course that provides an introduction of basic concepts and principles related to the Joint Nuclear Weapons Publication System (JNWPS) for professionals supporting the nuclear weapons enterprise. The course goal is to provide clear understanding of the JNWPS and why it exists.



Nuclear Safety Studies and Review (NSSR)

DNWS Course Number: DNWS SA 103 DL
JKO Course Number: DNWS SD-01
Course Prerequisites: DNWS NI 101- DL (PRAP), DNWS NI 104 DL (NWS)
Classification: UNCLASSIFIED
Security Requirements: None
Course Length: 4 hours; self-paced

NSSR is an awareness level course that provides an introduction of basic concepts and principles related to nuclear safety studies and reviews for professionals supporting the nuclear weapons enterprise. The course goal is to facilitate a clear understanding of what nuclear safety studies and reviews are and why they are conducted.



Nuclear Weapons Surety (NWS)

DNWS Course Number: DNWS NI 104 DL
JKO Course Number: DNWS ND01
Course Prerequisites: N/A
Classification: UNCLASSIFIED
Security Requirements: None
Course Length: 8 hours

NWS is an awareness level course that provides an introduction of basic concepts and principles related to nuclear surety for professionals supporting the nuclear weapons enterprise. The course goal is to facilitate a clear understanding of what nuclear surety is and how nuclear surety is achieved.



Personnel Reliability Assurance Program (PRAP)

DNWS Course Number: DNWS NI 101 DL, JCS-201210

JKO Course Number: JKO DNWS WD01

Course Prerequisites: N/A

Classification: UNCLASSIFIED

Security Requirements: None

Course Length: 3 hours, self-paced

PRAP is an awareness level course that provides an introduction of basic DOD PRAP fundamentals and concepts for personnel who are assigned duties involving nuclear weapons or nuclear command and control systems. The course addresses PRAP concepts, roles, responsibilities, and processes in support of nuclear surety and further explains these concepts in relationship to real-world scenarios.



The bomb is completely assembled atop the 100-foot tower.



PARTNERED COURSES

- **Defense Integration and Management of Nuclear Data Services (DIAMONDS)**
- **Functional Area 52 Qualification Course (FA-52 QC Phase 1)***
- **Joint Countering Weapons of Mass Destruction Planning Course (JCPC)**
- **Mission Assurance Assessment Course (MAAC)**
- **Theater Nuclear Operations Course (TNOG)**

CBRNE Modeling Simulation Courses

- **Geospatial Analysis for Consequence Assessment – Level 1 (GACA-1)**
- **Geospatial Analysis for Consequence Assessment – Level 2 (GACA-2)**
- **High Altitude Nuclear Effects (HANE)**
- **Hazard Prediction and Assessment Capability Level 1 (HPAC-1)**
- **Hazard Prediction and Assessment Capability Level 2 – Chemical, Biological, Radiological (HPAC-2-CBR)**
- **Hazard Prediction and Assessment Capability Executive Course (HPAC-Exec)**
- **Hazard Prediction and Assessment Capability – Nuclear (HPAC-N)**
- **Integrated Munitions Effects Assessment Level 1 (IMEA-1)**
- **Integrated Munitions Effects Assessment Level-2 - Conventional (IMEA-2-C)**
- **Integrated Munitions Effects Assessment - Nuclear (IMEA-N)**
- **Integrated Weapons of Mass Destruction Toolset – Consequence Assessment (IWMDT-CA)**
- **Integrated Weapons of Mass Destruction Toolset – Consequence Assessment - Nuclear (IWMDT-CA-N)**
- **Vulnerability Assessment and Protection Option Level 1 (VAPO-1)**
- **Vulnerability Assessment and Protection Option Level 2 (VAPO-2)**

* - denotes restricted course



Defense Integration and Management of Nuclear Data Services (DIAMONDS)

Course ID/Number: DNWS P 100

Course Prerequisites: N/A

Classification: SECRET

Security Requirements: CNWDI

Course Length: 3 days

DIAMONDS Training is a 3-day course that provides hands-on familiarization training with the national nuclear stockpile's sole accountability database for prospective and current users. Content of this course outlines current practices for generation, process, and submission of nuclear accountability transactions in the DIAMONDS system, as well as, the incorporation of DoD nuclear weapons accountability policies and procedures. Students should already be familiar with nuclear accountability transactions outside of DIAMONDS.

This Course is sponsored by the DTRA/J10NL. For more information please contact Diana Kuhn, (703) 767-4315, diana.l.kuhn.civ@mail.mil



Functional Area 52 Qualification Course (FA-52 QC Phase 1)*

Course ID/Number: DNWS P 500, USA DNWS-NROOC, USN S-140-0007

Course Prerequisites: N/A

Classification: SECRET

Security Requirements: Restricted Data/CNWDI or DOE "Q"

Course Length: 10 days

The Functional Area 52 Qualification Course (FA52 QC Phase I) is hosted annually at DNWS by the U.S. Army Nuclear and CWMD Agency (USANCA). The training is for U.S. Army FA-52 officers and serves as the Nuclear and CWMD Officers Functional Area Phase 1 qualifying course. Other students accepted by exception. Topics include; an overview of the physics of nuclear weapons, weapon characteristics, weapon engineering, weapon surety, weapon subsystem/component technology, scope of the US nuclear weapons program, stockpile stewardship, and the nuclear fuel cycle. In addition, students will conduct critical site visits to DOE laboratories and receive information briefings from subject matter experts.

For more information please contact: FA52 Proponent Manager, (571) 515-9951, usarmy.belvoir.hqda-dcs-g-3-5-7.mbx.usanca-proponency-division@mail.mil

* - denotes restricted course



Joint Countering Weapons of Mass Destruction Planning Course (JCPC)

Course ID/Number: DNWS P 300

Course Prerequisites: N/A

Classification: SECRET

Security Requirements: None

Course Length: 5 days

JCPC is a 5-day course that introduces students to U.S. Government and DoD policy, strategy, doctrine, and planning related to CWMD; teaches students to recognize CWMD equities in a strategic and operational context, and demonstrates how to incorporate them into the Joint Planning Process (JPP). The first half of the course focuses on the three strategic end states (prevent (pathway defeat), protect (WMD defeat), and respond (minimize WMD effects)) and the six CWMD Activities with their supporting tasks identified in the DOD Strategy for Countering WMD and joint doctrine. The second half of the course takes students through select areas of the JPP and merges CWMD and JPP concepts through a series of facilitator-led, small-group planning exercises.

This Course is sponsored by DTRA Intelligence and Plans Directorate. For more information please contact Mr. Victor Carter, (571) 616-6342, victor.t.carter3.civ@mail.mil



Mission Assurance Assessment Course (MAAC)

Course ID/Number: DNWS P 331, G55000APCIL

Course Prerequisites: JKO Course J3OP-US1401, Mission Assurance

Classification: SECRET

Security Requirements: None

Course Length: 5 days

MAAC is a 5-day course that provides training on the DoD Mission Assurance Assessment (MAA) Program, which is an integrated approach to assessing risk to mission. Students are provided the methodologies and tools to conduct MAAs of assets identified as critical to mission accomplishment. Students will also assess the mission assurance related programs and activities as they apply to the asset(s) using the DoD MAA Benchmarks. The course includes facilitated discussions, case studies, mock interviews, classroom exercises, field group exercises, and subject matter expert breakout sessions.

This course is sponsored by the Joint Staff, Deputy Directorate for Nuclear, Homeland Defense, and Current Operations (DD NHDCO), and conducted by DTRA.

For more information please email the DTRA MAA Help Mailbox: dtra.belvoir.ne.mbx.ne-maa-help@mail.mil or dtra.belvoir.ne.mbx.ne-maa-help@mail.smil.mil.



Theater Nuclear Operations Course (TNOOC)

Course ID/Number: DNWS P 305, USN S-140-0004, USA DNWS RO13, USAF-J5OZD13B404DA, DNWS MTT DNWS P 305 M

Course Prerequisites: NCP-52 or NWOC

Classification: SECRET

Security Requirements: Restricted Data-CNWDI

Course Length: 5 days

TNOOC is a 5-day course that provides training for planners, support staff, targeting staff, and staff nuclear planners for nuclear joint operations and targeting. The course provides instruction on theater integration of US nuclear capabilities into conventional operations, US nuclear policy, joint nuclear doctrine, nuclear effects modeling, consequences of execution, and targeting concepts. A Nuclear Weapons Instructional Museum (NWIM) tour at the S//RD-CNWDI level is also included.

For more information please contact

CW3 David McMorris, (571) 515-9965, david.j.mcmorris.mil@mail.mil or usarmy.belvoir.hqda-dcs-g-3-5-7.mbx.usanca-proponency-division@mail.mil



Geospatial Analysis for Consequence Assessment – Level 1 (GACA-1)

Course ID/Number: DNWS P 170, USA GACA-1

Course Prerequisites: N/A

Classification: UNCLASSIFIED

Security Requirements: None

Course Length: 4 days

GACA-1 is a 4-day course that provides students with tools to analyze CBRNE and natural hazards using Geospatial Information Systems (GIS) in conjunction with DTRA hazard modeling software. Students will work to produce comprehensive decision support products that communicate the operational impact of CBRNE and natural hazards to a Commander or Common Operational Picture (COP).

Software Registration is required (CBRNE Decision Support site: <https://cbrnedss.dtra.mil> for FIRST Basic, FIRST Nuclear and ICWater).

For more information contact CW4 Cargill and Mrs. Peggie Feaster, (571) 303-2171, dtra.belvoir.rd.mbx.reachback-training@mail.mil or peggie.j.feaster.ctr@mail.mil



Geospatial Analysis for Consequence Assessment – Level 2 (GACA-2)

Course ID/Number: DNWS P 171, USA GACA-2

Course Prerequisites: DNWS P 170, USA GACA-1

Classification: UNCLASSIFIED

Security Requirements: None

Course Length: 4 days

GACA–2 is a 4-day course that builds on the work in GACA–1 to apply modeling and analysis techniques to DTRA and third-party software to improve response time and streamline the modeling/analysis process of a CBRNE incident. Students will develop methods to communicate CBRNE response products across multiple software platforms.

Software Registration is required (CBRNE Decision Support site: <https://cbrnedss.dtra.mil> for FIRST Basic, FIRST Nuclear and ICWater).

For more information contact CW4 Cargill and Mrs. Peggie Feaster, (571) 303-2171, dtra.belvoir.rd.mbx.reachback-training@mail.mil or peggie.j.feaster.ctr@mail.mil



High Altitude Nuclear Effects (HANE)

Course ID/Number: DNWS CM-270

Course Prerequisites: N/A

Classification: SECRET

Security Requirements: Restricted Data-CNWDI

Course Length: 4 days

HANE is a modular, 4-day course that provides students with the basic concepts involving high altitude nuclear detonations, prompt and persistent nuclear environments, EMP, and their effects on military systems and infrastructure. The course includes basic understanding of the physics of high altitude nuclear explosions, survivability of space-based, airborne and ground based systems, and effects on radar and radio wave communications. Training includes software demonstrations, hands-on familiarization and practices using both command line and graphical user interfaces. Emphasis is placed on mission level and system performance impacts.

For more information contact CW4 Cargill and Mrs. Peggie Feaster, (571)303-2171, dtra.belvoir.rd.mbx.reachback-training@mail.mil or peggie.j.feaster.ctr@mail.mil

SPOTLIGHT: DNWS Training Sites

The most unique aspect to DNWS is our practical training. And, New Mexico's distinct legacy within the Nuclear Enterprise makes it the premiere locale for practical radiological and nuclear weapons training.

Located on Kirtland AFB, DNWS has access to several special training sites. The use of these sites is incorporated into many of the school's courses to reinforce the concepts and procedures explained in the classroom. In practical exercises, students are given the opportunity to recognize threats in real-time; don and use PPE; and practice response or search procedures using the actual equipment fielded to their parent organization. DNWS would not be able to provide these unique training experiences without the use of these training sites.

This section highlights three of the DNWS Training Sites on Kirtland AFB.

Operations/Training – 10 (OT-10) Sites



Called OT-10 sites by the Air Force, Training Sites 1 - 4 are the remainder of eight original sites developed by the school in 1966, largely in response to the Palomares nuclear weapons accident in Spain. The Palomares accident challenged responders with large scale radiological monitoring and clean-up operations. Eight fields were chosen and seeded with natural thorium, which is slightly radioactive, to create areas of detectable, elevated radiological background. The four sites still in use have a variety of aircraft or vehicle wreckage that students must navigate while employing detectors. Today, these sites are the only training areas of their type available to the DOD to safely practice working in elevated background.



NETOPS, JNEODC, ARRT-2 and BIRNT courses feature practical exercises using these training sites.



Test Evaluation Assessment Monitoring Site (TEAMS)



The TEAMS is a 28-acre flexible, multi-use facility that primarily serves the interagency community as an evaluation center for emerging programs and technologies to detect, combat and defeat radiological and nuclear threats. TEAMS provides a complex environment with



various structures, container stacks, and railway cars that are extremely effective for the training scenarios in several DNWS courses. DNWS has also used TEAMS's "international village" for tailored training and exercises. The village simulates a built up area and includes a variety of structures spread over 1.5 acres.



ADT-1, ADT-2, ARRT-2, and BIRNT courses feature practical exercises using this training site.

DNWS Advanced Radiological Training Site (DARTS)



The DARTS is a distinctive underground facility with over 12,000 square feet of enclosed training space. Formerly the Advanced Research EMP Simulator (ARES) facility, DARTS was first used by DNWS as a training site in 2018. Over the past three years, the DNWS team has gradually rehabilitated the facility from a testing platform into an invaluable training site that can replicate a variety of industrial facilities. Coordinated maintenance by the 210th RED HORSE Squadron has also freed up previously unusable underground areas adjacent to the facility that could be expanded into future training space.

ADT-2 and BIRNT courses feature practical exercises using this training site. The site is available for exercises and tailored training as well.





Hazard Prediction and Assessment Capability Level 1 (HPAC-1)

Course ID/Number: DNWS P 145, USA DTRA-ALEX-HL1

Course Prerequisites: N/A

Classification: UNCLASSIFIED

Security Requirements: None

Course Length: 5 days

HPAC-1 is a 5-day course that provides students with a basic level of competency in the modeling of hazardous material releases using the DTRA HPAC software package. Upon completion of the course, students will learn to apply the HPAC model to predict hazard environment areas and potential human effects based on user's mission requirements.

Software Registration is required (CBRNE Decision Support site: <https://cbrnedss.dtra.mil>).

For more information contact CW4 Cargill and Mrs. Peggie Feaster, (571)303-2171, dtra.belvoir.rd.mbx.reachback-training@mail.mil or peggie.j.feaster.ctr@mail.mil



Hazard Prediction and Assessment Capability Level 2 - Chemical, Biological, Radiological (HPAC-2-CBR)

Course ID/Number: DNWS P 150-C, USA DTRA-ALEX-HL2, DHS CM-150

Course Prerequisites: HPAC-1 and six months of HPAC experience

Classification: UNCLASSIFIED, **Security Requirements:** None,

Course Length: 5 days

HPAC-2-CBR is a 5-day course that provides students with a higher level of proficiency in modeling and analysis of chemical, biological, or radiological (CBR) hazard release using HPAC. Upon completion of the course, students will learn to apply HPAC advanced software features to model the transport and dispersion of CBR materials and their potential human and collateral effects based on mission requirements.

Software Registration is required (CBRNE Decision Support site: <https://cbrnedss.dtra.mil>).

For more information contact CW4 Cargill and Mrs. Peggie Feaster, (571)303-2171, dtra.belvoir.rd.mbx.reachback-training@mail.mil or peggie.j.feaster.ctr@mail.mil



Hazard Prediction and Assessment Capability Executive Course (HPAC-Exec)

Course ID/Number: DNWS P 101, USA DTRA-ALEX-HL2

Course Prerequisites: A basic understanding of the HPAC model and Consequence Assessment Modeling is desired but not required

Classification: UNCLASSIFIED, **Security Requirements:** None, **Course Length:** 2 days

HPAC-Exec is a 2-day course that provides Leaders/Decision Makers exposure to the Consequence Assessment Modeling methodologies and their capabilities and limitations. Upon completion of the course students will recognize HPAC products to best communicate the hazards associated with their operations, understand the uncertainties related to their HPAC products, and the guidance needed to provide the best modeling and simulation support.

For more information contact CW4 Cargill and Mrs. Peggie Feaster, (571)303-2171, dtra.belvoir.rd.mbx.reachback-training@mail.mil or peggie.j.feaster.ctr@mail.mil



Hazard Prediction and Assessment Capability - Nuclear (HPAC-N)

Course ID/Number: DNWS P 150-N, USA DTRA-ALEX-HL2

Course Prerequisites: N/A

Classification: UNCLASSIFIED
Security Requirements: None
Course Length: 5 days

HPAC-N is a 5-day course that provides students with a higher level of proficiency in modeling and analysis of nuclear hazard release using HPAC. Students will learn to apply the HPAC model to predict hazard environment areas and potential human effects based on user mission requirements.

Software Registration is required (CBRNE Decision Support site: <https://cbrnedss.dtra.mil>).

For more information contact CW4 Cargill and Mrs. Peggie Feaster, (571) 303-2171, dtra.belvoir.rd.mbx.reachback-training@mail.mil or peggie.j.feaster.ctr@mail.mil



Integrated Munitions Effects Assessment Level 1 (IMEA-1)

Course ID/Number: DNWS P 105, USA DTRA-ALEX-IL1

Course Prerequisites: N/A

Classification: SECRET

Security Requirements: None

Course Length: 5 days

IMEA-1 is a 5-day course that provides students with an initial level of competency in IMEA. Students will experience the capabilities and limitations of IMEA by creating/obtaining and equipping target models (buildings, bunkers and tunnels), analyzing conventional weapons penetration and damage capabilities, creating attack plans, and analyzing and interpreting results.

Software Registration is required (CBRNE Decision Support site: <https://cbrnedss.dtra.mil>).

For more information contact CW4 Cargill and Mrs. Peggie Feaster, (571) 303-2171, dtra.belvoir.rd.mbx.reachback-training@mail.mil or peggie.j.feaster.ctr@mail.mil



Integrated Munitions Effects Assessment Level 2 - Conventional (IMEA-2-C)

Course ID/Number: DNWS P 110, USA DTRA-ALEX-IL2

Course Prerequisites: IMEA-1

Classification: UNCLASSIFIED

Security Requirements: None

Course Length: 5 days

IMEA-2-C is a 5-day course that provides students with advanced skills in the application of IMEA conventional strike capabilities and limitations. Students will be exposed to an in-depth review of each methodology underlying the calculations in IMEA. Methodology lectures are followed by hands-on use of tailored IMEA scenarios.

Software Registration is required (CBRNE Decision Support site: <https://cbrnedss.dtra.mil>).

For more information contact CW4 Cargill and Mrs. Peggie Feaster, (571) 303-2171, dtra.belvoir.rd.mbx.reachback-training@mail.mil or peggie.j.feaster.ctr@mail.mil



Integrated Munitions Effects Assessment - Nuclear (IMEA-N)

Course ID/Number: DNWS P 115, USA DTRA-ALEX-IL2

Course Prerequisites: IMEA-1 (preferred, not required)

Classification: SECRET

Security Requirements: Formerly Restricted Data (FRD)

Course Length: 5 days

IMEA-N is a 5-day course that provides students with basic skills in the application of IMEA nuclear strike capabilities and limitations. Students will achieve proficiency with importing and creating target models, developing attack plans, performing consequence assessment to WMD scenarios, and communicating results.

Software Registration is required (CBRNE Decision Support site: <https://cbrnedss.dtra.mil>).

For more information contact CW4 Cargill and Mrs. Peggie Feaster, (571) 303-2171, dtra.belvoir.rd.mbx.reachback-training@mail.mil or peggie.j.feaster.ctr@mail.mil



Integrated Weapons of Mass Destruction Toolset - Consequence Assessment (IWMDT-CA)

Course ID/Number: DNWS P 260

Course Prerequisites: N/A

Classification: UNCLASSIFIED

Security Requirements: None

Course Length: 5 days

IWMDT-CA is a 5-day course in which the student achieves a basic level of competency in the modeling of Chemical, Biological, Radiological, and Nuclear (CBRN) hazard releases. Students use IWMDT-CA, a Net-centric tool, in a collaborative environment to predict hazard environment areas and potential human effects based on mission requirements.

Software Registration is required (CBRNE Decision Support site: <https://cbrnedss.dtra.mil>).

For more information contact CW4 Cargill and Mrs. Peggie Feaster, (571)303-2171, dtra.belvoir.rd.mbx.reachback-training@mail.mil or peggie.j.feaster.ctr@mail.mil



Integrated Weapons of Mass Destruction Toolset – Consequence Assessment - Nuclear (IWMDT-CA-N)

Course ID/Number: DNWS P 261

Course Prerequisites: N/A

Classification: UNCLASSIFIED, **Security Requirements:** None,
Course Length: 5 days

IWMDT-CA-N is a 5-day course in which the student achieves an initial level of competency in the modeling of nuclear hazard releases. Students use IWMDT-CA, a Net-centric tool, in a collaborative environment to predict nuclear hazard environment areas and potential human effects based on mission requirements.

Software Registration is required (CBRNE Decision Support site: <https://cbrnedss.dtra.mil>).

For more information contact CW4 Cargill and Mrs. Peggie Feaster, (571)303-2171, dtra.belvoir.rd.mbx.reachback-training@mail.mil or peggie.j.feaster.ctr@mail.mil



Vulnerability Assessment Protection Options Level 1 (VAPO-1)

Course ID/Number: DNWS P 135, USA DTRA-ALEX-VL1

Course Prerequisites: N/A

Classification: UNCLASSIFIED
Security Requirements: None
Course Length: 5 days

VAPO-1 is a 5-day course in which students will receive instruction in the full functionality of VAPO to include its capabilities, limitations, and assumptions. Using VAPO functionality, students will assess and analyze a spectrum of threats against assets and develop mitigating strategies with respect to vulnerability assessment and force protection.

Software Registration is required (CBRNE Decision Support site: <https://cbrnedss.dtra.mil>).

For more information contact CW4 Cargill and Mrs. Peggie Feaster, (571)303-2171, dtra.belvoir.rd.mbx.reachback-training@mail.mil or peggie.j.feaster.ctr@mail.mil



Vulnerability Assessment Protection Options Level 2 (VAPO-2)

Course ID/Number: DNWS P 140, USA DTRA ALEX VL2

Course Prerequisites: VAPO-1

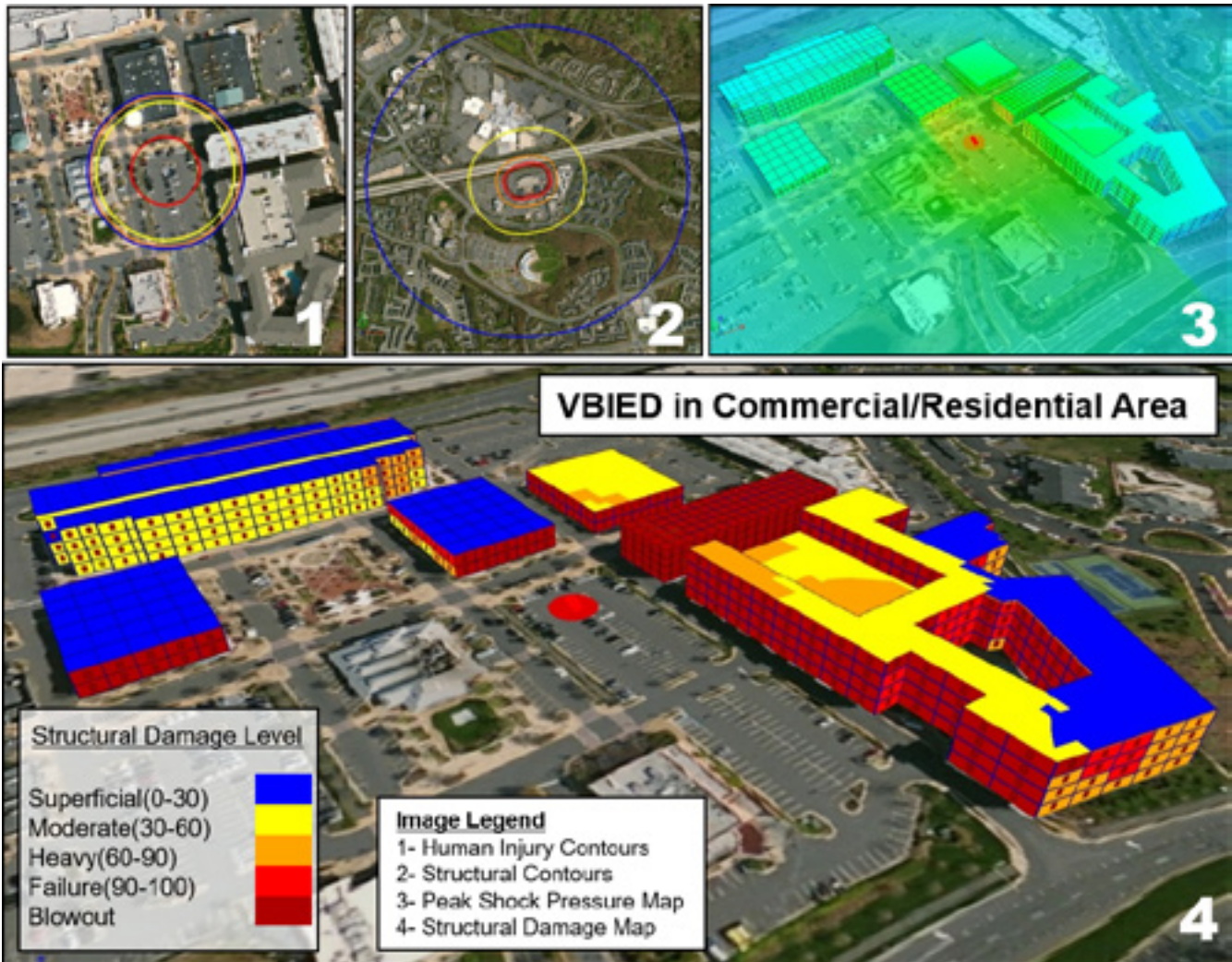
Classification: UNCLASSIFIED

Security Requirements: None

Course Length: 4 days

VAPO-2 is a 4-day course designed to enable users to achieve a higher level of understanding of the software's physics based blast effects models to enhance the application of VAPO for force protection, anti-terrorism and vulnerability assessment modeling against a wide spectrum of real world threats.

For more information contact CW4 Cargill and Mrs. Peggie Feaster, (571)303-2171, dtra.belvoir.rd.mbx.reachback-training@mail.mil or peggie.j.feaster.ctr@mail.mil

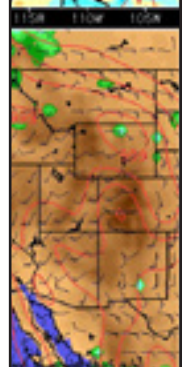
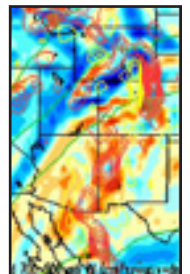


CBRNE Modeling and Simulations Training Team



DTRA Research & Development Directorate, Reachback Division (RD-OPR) provides 24/7 Chemical, Biological, Radiological, Nuclear, Explosive (CBRNE) SME and decision support for planning, operations, and post-event analysis to warfighters and emergency responders. Additionally, Reachback manages and implements the DTRA training contracts in support of Joint, Intergovernmental, Interagency, and Multinational organizations, providing training on DTRA CBRNE decision support analysis software tools. The DTRA CBRNE Decision Support Analysis Capabilities Training Support team provides training on DTRA- and third party-developed Weapons of Mass Destruction (WMD) models, tools, and capabilities for military and emergency responder operations. Reachback offers the following CBRN Modeling and Simulations courses at DNWS. Classes are normally 4-5 days in length.

- Geospatial Analysis for Consequence Assessment – Level 1 (GACA-1)
- Geospatial Analysis for Consequence Assessment – Level 2 (GACA-2)
- High Altitude Nuclear Effects (HANE)
- Hazard Prediction and Assessment Capability Level 1 (HPAC-1)
- Hazard Prediction and Assessment Capability Level 2 – Chemical, Biological, Radiological (HPAC-2-CBR)
- Hazard Prediction and Assessment Capability Executive Course (HPAC-Exec)
- Hazard Prediction and Assessment Capability – Nuclear (HPAC-N)
- Integrated Munitions Effects Assessment Level 1 (IMEA-1)
- Integrated Munitions Effects Assessment Level-2 - Conventional (IMEA-2-C)
- Integrated Munitions Effects Assessment - Nuclear (IMEA-N)
- Integrated Weapons of Mass Destruction Toolset – Consequence Assessment (IWMDT-CA)
- Integrated Weapons of Mass Destruction Toolset – Consequence Assessment - Nuclear (IWMDT-CA-N)
- Vulnerability Assessment and Protection Option Level 1 (VAPO-1)
- Vulnerability Assessment and Protection Option Level 2 (VAPO-2)



DNWS has a collaborative educational exchange agreement with the U.S. Air Force Nuclear College to expand the general audience's awareness of available training within the CWMD realm.



AFIT SCHOOL OF STRATEGIC FORCE STUDIES, DEPARTMENT OF NUCLEAR STUDIES - AIR FORCE NUCLEAR COLLEGE

- Air Force Nuclear Fundamentals Course (Nuclear 200)
- Air Force Nuclear Concepts Course (Nuclear 300)
- Senior Leader Nuclear Management (Nuclear 400)
- Air Force Nuclear Certification Process Course
- Air Force Nuclear Certified Equipment (NCE) Users Course

For the latest course schedule and registration information, contact the Air Force Nuclear College Registrar at: COMM: 505 846-7784, DSN: 246-7784, or email: AFIT.OL-A.Registrar@us.af.mil.



Air Force Nuclear Fundamentals Course (Nuclear 200)

Course ID/Number: ETCA: WNUC200; MILPDS: 2X1

Course Prerequisites: N/A

Classification: SECRET, **Security Requirements:** Restricted Data-CNWDI,

Uniform: As directed by the individual service, **Format:** N/A, **MTT:** N/A,

Course Length: 5 days (40 hours)

This five day in-residence course is designed to enhance awareness among Airmen of the USAF nuclear mission; the course covers nuclear weapon fundamentals, force structure, nuclear stockpile guidance and planning, the DoD/AF nuclear surety program, the nuclear community, and current issues related to the USAF's nuclear mission. The focus of this course is an 'overview' of the entire nuclear enterprise for individuals that have completed at least one operational nuclear assignment and will stay core nuclear for most of their career or for support function/AFSCs assigned to a nuclear unit/job in a supervisory, command, or decision making position and this is their first nuclear mission assignment.



Air Force Nuclear Concepts Course (Nuclear 300)

Course ID/Number: ETCA: WNUC300, MILPDS: 015

Course Prerequisites: N/A

Classification: SECRET, **Security Requirements:** Restricted Data-CNWDI,

Uniform: As directed by the individual service, **Format:** N/A, **MTT:** N/A,

Course Length: 5 days (40 hours)

The course provides an in-depth look at key aspects of the Air Force nuclear enterprise to enable better understanding of nuclear deterrence history, theory, and application; nuclear operations policy and strategy; nuclear incident/accident response; and nuclear surety and effects. The focus of this course is for individuals who are at the 9+ year point working in the nuclear enterprise. They are 'core nuclear' and going to a position where they will be setting nuclear policy, procedures, etc. within their functional areas. Normally at the NAF division chief level, MAJCOM branch chief level or HAF/Joint 04 AO level or higher. Also, for nuclear AFSC Sq/CCs who have not attended before selection for command.



Senior Leader Nuclear Management (Nuclear 400)

Course ID/Number: ETCA: WNUC400, MILPDS: 0KQ

Course Prerequisites: N/A

Classification: TOP SECRET, **Security Requirements:** Restricted Data-CNWDI,

Uniform: As directed by the individual service, **Format:** N/A, **MTT:** N/A,

Course Length: 2 days (16 hours)

The purpose of the Senior Leader Nuclear Management course is to provide a forum for senior leaders to discuss deterrence theory, nuclear policy, arms control, and other nuclear issues.

Attendance is by invitation. Please contact the Air Force Nuclear College Registrar for more information.

The focus of this course is for senior leaders who are either: A) *Flag Officers and SESs that have nuclear responsibilities anywhere in their portfolio of responsibilities;* B) *Working internal to the nuclear enterprise and are usually post Sq/ CC command in an O6/civilian equivalent level HAF/ MAJCOM 3 Ltr billet or E9 in similar functional expert billet.*



Air Force Nuclear Certification Process Course

Course ID/Number: In-Residence Course (Kirtland AFB):
 ETMS: CKVNUC0000100SU, MIL PDS Code: CIA, MIL PDS Code: XW2
 (Non-Resident Course), MIL PDS Code: ORV, (Non-resident Exec Course)
Course Prerequisites: N/A

Classification: UNCLASSIFIED, **Security Requirements:** N/A,
Uniform: As directed by the individual service, **Format:** N/A, **MTT:** N/A,
Course Length: In-Residence - 2 days (16 hours); Non-Residence - 1 day (8 hours)

This course provides attendees with an understanding of the Air Force Nuclear Certification Process as prescribed by AFI 63-125, Nuclear Certification Program. It identifies, defines, and explains the four phases of the certification process, the two major elements of Nuclear Certification (Design Certification and Operational Certification) and their components. The course provides a practical discussion on the development, submittal, and approval process for the Nuclear Certification Impact Statement (NCIS) and the Certification Requirements Plan (CRP).



Air Force Nuclear Certified Equipment (NCE) Users Course

Course ID/Number: ETMS: CKVNUC0000600SU; MILPDS: 05G
Course Prerequisites: N/A

Classification: UNCLASSIFIED, **Security Requirements:** N/A, **Uniform:** As directed by the individual service, **Format:** N/A, **MTT:** Please contact the Air Force Nuclear College Course registrar to arrange MTT presentation, **Course Length:** 1 day (8 hours)

The Air Force Nuclear Certified Equipment (NCE) Users Course is designed to enhance Air Force Nuclear Surety by increasing awareness of the responsibilities and requirements for personnel who operate, maintain, and manage NCE. This course is designed to help field users and other personnel become familiar with the basics of handling, managing, and reporting NCE. The course will provide familiarization with elements of the NCE Management Program and enhance attendee's knowledge and understanding of how to use the Master Nuclear Certification List. Primary topics in this course will cover how and why equipment is nuclear certified, requirements and responsibilities for the management of NCE, how to use the Master Nuclear Certification List, determining NCE serviceability and certification status, and the requirements for deficiency reporting on NCE.





DNWS has a collaborative educational exchange agreement with FEMA's Center for Domestic Preparedness (CDP) to expand the general audience's awareness of available training within the CWMD realm.



FEMA Center for Domestic Preparedness

- ***Incident Command: Capabilities, Planning, and Response Actions for All Hazards (IC)***
- ***Radiological Emergency Response Operations (RERO) Course***
- ***Advanced Radiological Incident Operations (ARIO) Course***

For the latest CDP course schedule and registration information, contact CDP at (866) 213-9553 or visit the CDP website at <https://cdp.dhs.gov/>. The full training catalog may be viewed at: <https://www.firstrespondertraining.gov/frts/npcc>
CDP courses adhere to the following regulations: Federal Emergency Management Agency Radiological Emergency Preparedness Program; the Environmental Protection Agency Manual or Protective Action Guides; and Protective Actions for Nuclear Incidents.



Incident Command: Capabilities, Planning, and Response Actions for All Hazards (IC)

Course ID/Number: MGT-360

Course Prerequisites: AWR-160, IS-100.b or any of the ICS-100 series; and IS-200.b, or any of the ICS-200 series

Classification: UNCLASSIFIED, **Security Requirements:** None,

Course Length: 3 days

IC is a 3-day course that provides management-level responders working in supervisory positions with knowledge of how decisions made by responders from various disciplines can impact the handling of a CBRNE incident. The course incorporates preparedness planning considerations and incident management concepts to train participants to serve as members of an incident management team. Other topics include: threat evaluation, target identification and prioritization, and Incident Response Plan (IRP) and Incident Action Plan (IAP) processes. The course culminates with a real-time, scenario-driven tabletop exercise that requires participants to plan for and manage emergency response resources.



Radiological Emergency Response Operations (RERO) Course

Course ID/Number: PER-904

Course Prerequisites: AWR-160, IS-100.b, IS-200.b, IS-700.a, IS-800.b, and IS-3

Classification: UNCLASSIFIED, **Security Requirements:** None,

Course Length: 5 days

RERO is a 5-day course that provides participants with the basic skills necessary to safely respond to incidents involving radiological hazards. Participants learn the concepts, equipment, and procedures related to radiological incident response, including those of a commercial nuclear power facility. The course includes lectures, hands-on training, and team exercises, and culminates with an Integrated Capstone Event with the Advanced Radiological Incident Operations (ARIO) course. During the exercise, RERO course will focus on first responder hands-on equipment skills, and responsibilities as members of a field monitoring team during radiological Plume and Ingestion Pathway incidents.

The full training catalog may be viewed at:
<https://www.firstrespondertraining.gov/frts/npcc>



Advanced Radiological Incident Operations (ARIO) Course

Course ID/Number: PER-905

Course Prerequisites: AWR-160 and one of the following: PER-904, PER-240 or PER-241

Classification: UNCLASSIFIED, **Security Requirements:** None,

Course Length: 5 days

ARIO is a 5-day course that provides participants with the advanced skills necessary to safely respond to and manage incidents involving radiological hazards. Participants apply these skills in tabletop exercises based on realistic radiological incident scenarios, set within the Incident Command System structure. The course culminates with an Integrated Capstone Event with the Radiological Emergency Response Operations (RERO) course. During the exercise, the ARIO course will focus on Emergency Operations Center responsibilities, coordination of the field monitoring teams, data collection, and developing recommendations for protective actions.



FEMA Regions and Location of Regional Offices

How to Register for Classes

DNWS Registration and Course Administration Information

General information about DNWS is available on the DNWS web site <https://dnws.dtra.mil>. The site is available to DoD and other Federal and state agencies, accessible only from .mil or .gov domains.

Course Registration Process

Please read all sections of the course registration process, paying particular attention to security requirements, prerequisites, quota limitations, and requirements for non DoD personnel. DNWS has simplified and automated the course registration process. New students will complete a two-step process to register for DNWS courses. Step 1 requires students to request access to the DNWS Learning Content Management System (LCMS). After receiving access to the LCMS, prospective students will complete Step 2 to register for courses. Returning students need only log in to the LCMS and complete Step 2.



Step 1 (New/Prospective Students)

Prospective students should click the link provided (<https://dnws.dtra.mil>), select the "Register" tab, complete the "Register for Access to the Portal" form, and click "Submit Credentials for Access." All fields are required to provide contact information for the students. Upon completion and email will be sent to the provided email address with login and password.

Step 2 (Registered and Returning Students)

Students who have received a DNWS LCMS User ID and password may register for courses. Click on the link provided (<https://dnws.dtra.mil>), enter User ID and password in the spaces provided, and click "Login." A "Recover Login ID/Password" button is located at the bottom of this window if password is forgotten. For all other login issues please call or email DNWS Registrar office. DoD students can tie their CAC/PIV certificates to their account for ease of access. This is recommended as it makes accessing the DNWS internal network computers much easier. Once logged in, students may review transcripts, update profile information, browse the DNWS catalog and certification programs, register for courses or review existing course registrations, and take DNWS distance learning courses.

Registration for Non-DoD Students

Inbound students whose security clearances cannot be validated in the Defense Information System for Security (DISS) must provide validation of their security clearance prior to being registered for classified courses. Clearances can be passed to DTRA via a Visit Authorization Letter (VAL) that includes the students Name, Grade/Rank, Social Security Number, Birth Date, Birth City, Birth State, Birth Country, Citizenship, Visit Dates, Clearance Level, Date Clearance Granted, Clearance Granted By (issuing agency), Type Investigation, Date Investigation Completed, Investigation Conducted By (Investigating Agency), Meeting POC (Use DNWS Registrar or Course Manager), Security Manager Name & Phone #. Once complete the letter should be sent via fax to DTRA Access/Visitor Control at (703) 767-7857.

Registration for DOE Students

DOE personnel may work with their badging office and elect to complete a DOE form 5631.20 in lieu of the VAL. For all of our classified courses the minimum DOE security clearance requirement is a "Q". The completed DOE form 5631.20 must validate a Q clearance, list the course to be attended, and request access to Secret/Restricted Data/Critical Nuclear Weapon Design Information. The form must also be signed by a security official or badging office and can be faxed to DTRA Access/Visitor Control at (703) 767-7857.

Organization/Service Branch Quotas

The following DNWS courses are subject to organization/service branch quotas: ADT-1, ADT-2, JNEODC & NETOPS. Classes may show open seats on the website however, existing quota agreements may preclude general registration. Any student who exceeds the existing service quota will be placed on a wait-list until 30 days prior to the course start date.

Once the 30 day mark is reached, wait-listed students will be registered in the order in which they were wait listed. USAF & USMC personnel attempting to register for these courses be advised: The DNWS works with 2d Air Force and

Training & Education Command (TECOM) to fill seats in these courses. Inbound students from those existing training pipelines are granted priority for registrations. Any USAF or USMC student who is set to be unit funded, will be wait-listed and will only be registered if seats are not filled by throughput from 2d AF or TECOM or if seats promised to the other sources remain available past the 30 day mark.

Classified Course Security Clearance Requirements

All prospective students should reference the security requirements of their desired training listed on the course information page accessible from the "Training Courses" page. Before attempting to register, students should ensure they meet the minimum requirements. Any student who does not meet the minimum requirements will be withdrawn and notified of disenrollment. The DNWS will not read inbound students into specific areas such as "Restricted Data" or "Critical Nuclear Weapon Design Information" (some exceptions apply for partnered courses such as TNOC).



Email: dtra.kirtland.ne.mbx.dnws-registrar@mail.mil

Fax: Comm: (505) 846-9168 DSN: 246-9168

U.S. Mail: Defense Nuclear Weapons School
Attn. Registrar's Office
1680 Texas St. SE
Kirtland AFB, NM 87117-5669

Registering without Internet Access

Students who cannot access the website can submit a DTRA Form 34 (page 64 of this catalog). The form must be completed in its entirety and can be faxed to the DNWS registrar at (505) 846-9168. For classified courses, DoD students will be verified in DISS. Non DoD students must provide alternate means of security clearance validation using the instructions listed above as an additional step.

JNEODC Special Requirements

Personnel registering for the Joint Nuclear Explosive Ordnance Disposal Course (JNEODC) are required to submit a visit request to Sandia National Labs through DISS using the SMO Code 14213 and fill out the Sandia Badge Request Form. Completed forms can be faxed to 505-844-3377 emailed to ml_tr@sandia.gov.

Enrollment Confirmation

The DNWS LCMS will automatically generate and send enrollment confirmation to prospective students by email upon completion of the DNWS course registration process and verification of security clearance information (as appropriate). To ensure receipt of confirmation and other course information, students must provide an unclassified government e-mail address when they register for access to the LCMS.

The DNWS (<https://dnws.dtra.mil/>), will apprise students of changes in class dates, times, and/or location. If a student has not received enrollment confirmation by one week prior to the class start date, he or she should call the DNWS Registrar's Office main line, (505) 846-5666 or DSN 246-5666, Monday-Friday, 0800-1530, Mountain Time or contact them by email, dtra.kirtland.ne.mbx.dnws-registrar@mail.mil.

Security Check-In/Badging

All personnel entering the DNWS are required to show valid identification at the security desk and receive appropriate badging. As previously noted, specific courses may require a security clearance and some require special access. Each DNWS course has specific security requirements detailed in its catalog course description. Inbound DoD students are not required to submit a visit request through DISS (exception: JNEODC).

Electronic Equipment

Telephone lines with DSN access, are available for students to make and receive telephone calls while in the facility. Internet access at the DNWS is available for students on a limited basis. Security procedures prohibit bringing personal electronic devices (such as but not limited to cellular telephones, pagers, personal digital assistants, cameras, thumb drives, laptop computers, fitbits or like devices) into the school.

Specific instructions for other DTRA or partnered courses will be provided in the course invitation message.

Course Registration Form



DTRA Defense Nuclear Weapons School Course Registration **For official Use only. Privacy Act of 1974 Applies**



PRIVACY ACT STATEMENT

Authority: 5 U.S.C. 301, Departmental Regulations; 5 U.S.C. 4103, Establishment of Training Programs; 10 U.S.C. 1701, Management Policies; E.O. 11348, Providing for the further training of Government employees; 5 CFR part 410, Office of Personnel Management-Training; and E.O. 9397 (SSN).

Purpose(s): To determine applicant eligibility, as a record of attendance and training, completion or elimination, as a locator, and a source of statistical information.

Routine Use: Records may be disclosed outside the DoD as permitted under 5 U.S.C. 552a(b) of the Privacy Act, to officials and employees of Government agencies in the performance of their official duties related to training requirements and certification; and screening and selection process; to state and local agencies to track, manage, and report on training and certification; and the DoD 'Blanket Routine Uses'.

Disclosure: Voluntary, however failure to provide the information may render applicant ineligible to enroll in the course.

INSTRUCTIONS: To register for one of our courses, please ensure this form is fully completed and forward to the DNWS Registrar, 1900 Wyoming Blvd SE, Kirtland AFB NM, 87117-5659, or fax to commercial line (505) 846-9168 or DSN 246-9168. Department of Energy (DOE) personnel must also fill out DOE Form 5631.20 to register. Registration and security clearance data must be received a minimum of 15 working days prior to class start date.

APPLICANT'S INFORMATION

1. NAME (Last, First, MI)		2. RANK / GRADE	3. SSN (*Full SSN REQUIRED)
4. SERVICE	5. AGENCY	6. DUTY TITLE	
7. UNIT MAILING ADDRESS (Organization, Street Name, Installation or City, State, and Complete Zip Code)			
8. UNCLASSIFIED WORK EMAIL ADDRESS (REQUIRED)		9. DUTY PHONE NUMBER DSN: COMM:	10. FAX NUMBER DSN: COMM:
SUPERVISORY POC (Enter name, email, and telephone number (including area code) and name of an individual who can be contacted after normal duty hours in the event of an emergency)			
11. SUPERVISORY NAME (*REQUIRED)	12. SUPERVISORY EMAIL(*REQUIRED)	13. SUPERVISORY TELEPHONE NUMBER(*REQUIRED)	

COURSE INFORMATION

14. COURSE TITLE / NUMBER	15. CLASS START DATE	16. CLASS END DATE
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SECURITY CLEARANCE AND SPECIAL ACCESS – To be completed and signed by Unit Security Manager

Some courses may require security clearance and special access. Refer to course descriptions for prerequisites. Security clearance must be received by the DNWS Registrar Office no later than 15 working days prior to class start date. To tour the Weapons Display Area, all students/visitors are required to have a DoD Secret-level clearance with Restricted Data (RD) or Critical Nuclear Weapons Design Information (CNWDI) access, or a DOE "Q" clearance with Sigmas 1-5. DOE personnel must use the DOE form 5631.20 to submit clearance information.

17. PLACE OF BIRTH:	18. DATE OF BIRTH:	19. CITIZENSHIP:
20. FOREIGN NATIONALS: (Please provide your passport number:		
21. APPLICANT'S CLEARANCE LEVEL <small>(Please annotate below -- S=Secret TS= Top Secret or Q = DOE Top Secret</small>		22. DATE OF CLEARANCE:
ACCESS - CHECK AUTHORIZED ACCESS <input type="checkbox"/> NONE <input type="checkbox"/> SIGMAS 1-5 <input type="checkbox"/> RESTRICTED DATA(RD) <input type="checkbox"/> CNWDI		23. ACCESS DATE:

I certify that the above named applicant requires access as indicated in this document in the performance of duty that permitting such access will not endanger command defense and security.

24. SECURITY MANAGER'S TYPED / PRINTED NAME:		25. DUTY PHONE:
26. SECURITY MANAGER'S SIGNATURE:	27. SECURITY MANAGER'S UNCLASSIFIED EMAIL ADDRESS:	28. DATE:

DTRA Form 34 (SEPT 2018) (Adobe LiveCycle ES)

Download this pdf form at: <https://dnws.dtra.mil/Catalog/DisplayNC.cfm?id=24>

ADMINISTRATIVE ITEMS, FORMS AND MAPS

Mobile Training Team Course Request

Your Organizational Letterhead

DATE

MEMORANDUM FOR DNWS/NE-IES

ATTN: Registrar Office
1680 Texas St SE
Kirtland AFB, NM 87117-5669

SUBJECT: Request for DNWS Training Support/Mobile Training Team (MTT)

1. The following information is provided:
 - a. Course/Training Requested: **(Name and course number)**
 - b. Requesting Organization: **(Your organization's name)**
 - c. Expected Audience: **(General background of audience and number of students)**
 - d. Requested Time Period: **(Provide primary and at least two alternate dates, if possible)**
 - e. Equipment available to support training: **(Your home station's assistance is appreciated)**
 - f. Point of Contact / Resource Management Liaison: **(Provide POC to act as liaison between your organization and the DNWS staff for planning & accounting purposes, etc.)**
 - g. Other: **(Address other specifics as required by the course, such as special clearances)**
2. My organization accepts responsibility for ensuring all personnel projected to attend the Training MTT have proper security clearance and access to the MTT course. A consolidated list of students, to include full name, rank, social security number, and security clearance will be provided to the instructor(s) before the course begins.
3. My organization accepts responsibility for all expenses associated with this Training/MTT, including travel expenses/costs/shipping of equipment. Furthermore, we agree to provide administrative support as required. Funding and travel-order authorization letter for Training/MTT will be forwarded to the DNWS NLT 15 working days prior to class start date.
4. We understand that approval of this request is based upon availability of DNWS staff and training schedules.
5. Direct questions regarding the request to (Your organization POC and duty phone).

Signature Block
(O-5/GS-14 or Higher)

Download this pdf form at: <https://dnws.dtra.mil/Catalog/DisplayNC.cfm?id=31>

Funding Authorization Letter to DNWS for Mobile Training Team Course

Your Organizational Letterhead

DATE

MEMORANDUM FOR DNWS/NE-IES

ATTN: Registrar Office
1680 Texas St SE
Kirtland AFB, NM 87117-5669

SUBJECT: Funding and Travel-Order Authorization for DNWS Training Support/Mobile Training Team (MTT)

1. Expenses are authorized for (Names of DNWS Personnel) to include but are not limited to transportation, billeting, meals, and rental car, as well as any other expenses authorized by the Joint Federal Travel Regulations.
 - a. Fund Cite:
 - b. Not-to-exceed amount for travel:
2. DNWS will submit the travel-order authorization, DD Form 1610 Request and Authorization for TDY Travel of DoD Personnel, through the Defense Travel System (DTS) and will cite the requestor funds as outlined in the letter of authorization.
3. Upon return from Temporary Duty Assignment (TDY), the traveler will prepare the DD Form 1351-2, Travel Voucher or Sub-voucher, and send to DNWS finance who will forward to the requesting agency for payment through DTS.
4. POC is _____ and duty phone is _____.

Signature Block
(O-5/GS-14 or Higher)

Download this pdf form at: <https://dnws.dtra.mil/Catalog/DisplayNC.cfm?id=30>

Billeting/Transportation/Dining, Kirtland Air Force Base, New Mexico

Billeting on Kirtland AFB, NM

Individuals attending courses at the DNWS are responsible for their own billeting arrangements. Military personnel and Federal employees may make reservations by contacting the Kirtland AFB Billeting Office (Kirtland Inn) by calling (505) 846-9653 or DSN 246-9653 or by fax (505) 846-4142 or DSN 246-4142.

Military personnel of the rank of O-6 or above and civilian personnel at grade GS-15 or above should contact the Kirtland AFB Protocol Office at (505) 846-3894 or DSN 246-3894. The Kirtland Inn will accept reservations on base, if space is available. If space is not available, these individuals should make reservations at a local hotel at the government contract rate. The Kirtland Inn is the only agency that can issue statements of non-availability, and only if personnel make billeting arrangements through the Kirtland Inn office.

Arrival at Kirtland AFB, NM

Visitors without a military I.D. may need to obtain a visitor pass to enter Kirtland AFB. Individuals needing a pass should plan accordingly and, on the first day of class, arrive at one of the two Kirtland AFB Visitors' Centers located at the Gibson and Truman Gates at least 45 minutes prior to class start time. Please ensure you have a valid driver's license, proof of insurance, and vehicle registration or rental car agreement.

For your safety, please remember to observe all posted speed limits. Additionally, hands-free cell phone use, seat belt use, and valid driving insurance are required while driving on Kirtland AFB and the surrounding area.

Transportation to Kirtland AFB, NM

Kirtland AFB has limited taxi/transportation services. If staying at Kirtland AFB Billeting, On-base taxi service can be contacted at 505-846-8294. The Albuquerque International Airport is approximately five miles from the DNWS. On-base billeting is approximately three miles from the DNWS. A rental car is highly recommended.

Dining at Kirtland AFB, NM

All students are responsible for their own meals and should come to DNWS under full per-diem. Time is afforded to each student for meals. Kirtland AFB has several different options when it comes to meals and they are all located within a few miles of the school. These include the AAFES Main Exchange Food Court, Bowling Alley, Golf Course, McDonald's. There are also a variety of dining options off-base within close proximity to Kirtland AFB.

National Capital Region

Billeting in the National Capital Region (NCR) and Ft. Belvoir, VA

Individuals attending a DNWS course held in the NCR are responsible for their own billeting arrangements. Students should come to the NCR under full per-diem or plan to pay out-of-pocket expenses, as necessary.

Arrival into the NCR

Despite the fact that the majority of courses are taught at facilities outside a military base, students may want to visit one of the local military facilities. Students without a military I.D. may need a visitor's pass. To obtain a visitor's pass, proceed to the Visitor Center and please ensure you have a government identification card, a valid driver's license, proof of insurance, and vehicle registration or rental car agreement.

For your safety, please remember to observe all posted speed limits. Additionally, hands-free cell phone use, seat belt use, and valid driving insurance are required while driving within the NCR and surrounding area.

Transportation within the NCR

Two international airports service the NCR, Ronald Reagan Washington National (DCA) and Washington Dulles International (IAD). The airports are approximately 10-20 miles from DNWS instruction sites, distance dependent upon the airport and the identified instructional site. The NCR has unlimited taxi/transportation services; however, such service is expensive. A rental car is highly recommended.

Dining within the NCR

Students are responsible for their own meals, and instructors provide ample time during classes for student meals. The NCR offers a variety of dining options located within a few miles of the instruction sites.

Map to DNWS, Kirtland AFB, Albuquerque, NM

Directions to the **Defense Nuclear Weapons School (DNWS)** from Albuquerque International Sunport (ABQ) and a map of the surrounding area.



From the Airport, take Yale north and turn right onto Gibson Boulevard. Head east to Gibson Gate; Gibson Gate is open from 0530-2200. Once past the gate, drive east until you reach the intersection of Gibson Blvd and Wyoming Blvd. Turn right and drive south until you pass Kirtland Federal Credit Union, which will be a small building on your left just past K Avenue. Turn left into the parking lot. The address is 1900 Wyoming Blvd. If arriving between 2200 and 0530, please use the Eubank or Truman Gate, open 24 hours, 7 days a week. Please note: the building is labeled 1900, not 20602. There is a sign on Wyoming Blvd.

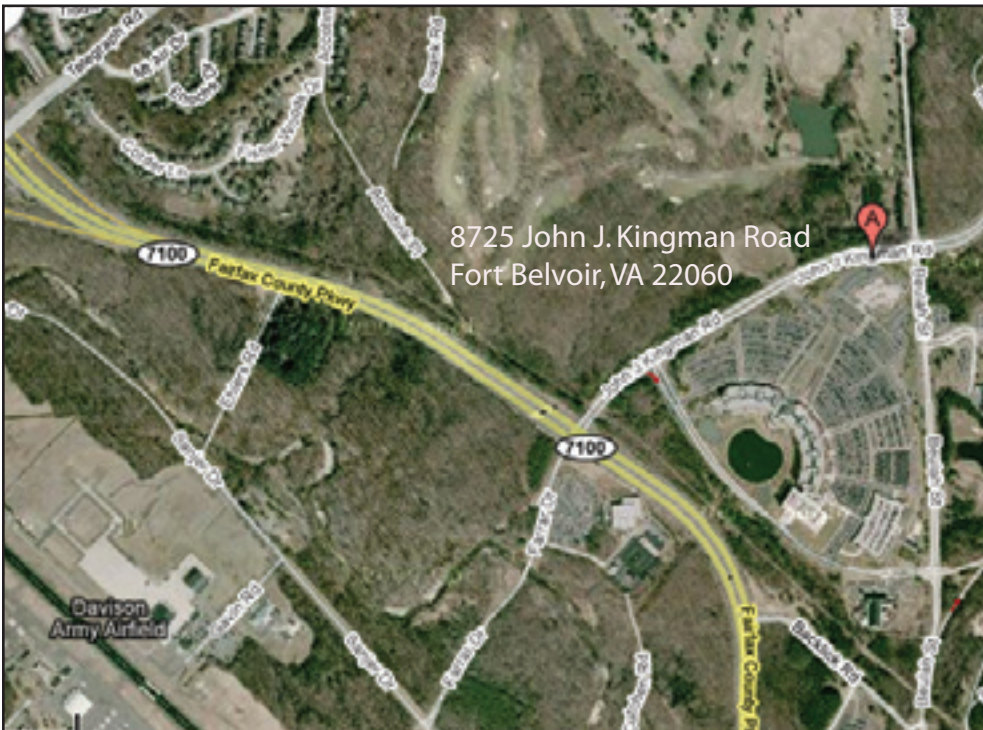
Map to DTRA Ft. Belvoir, VA



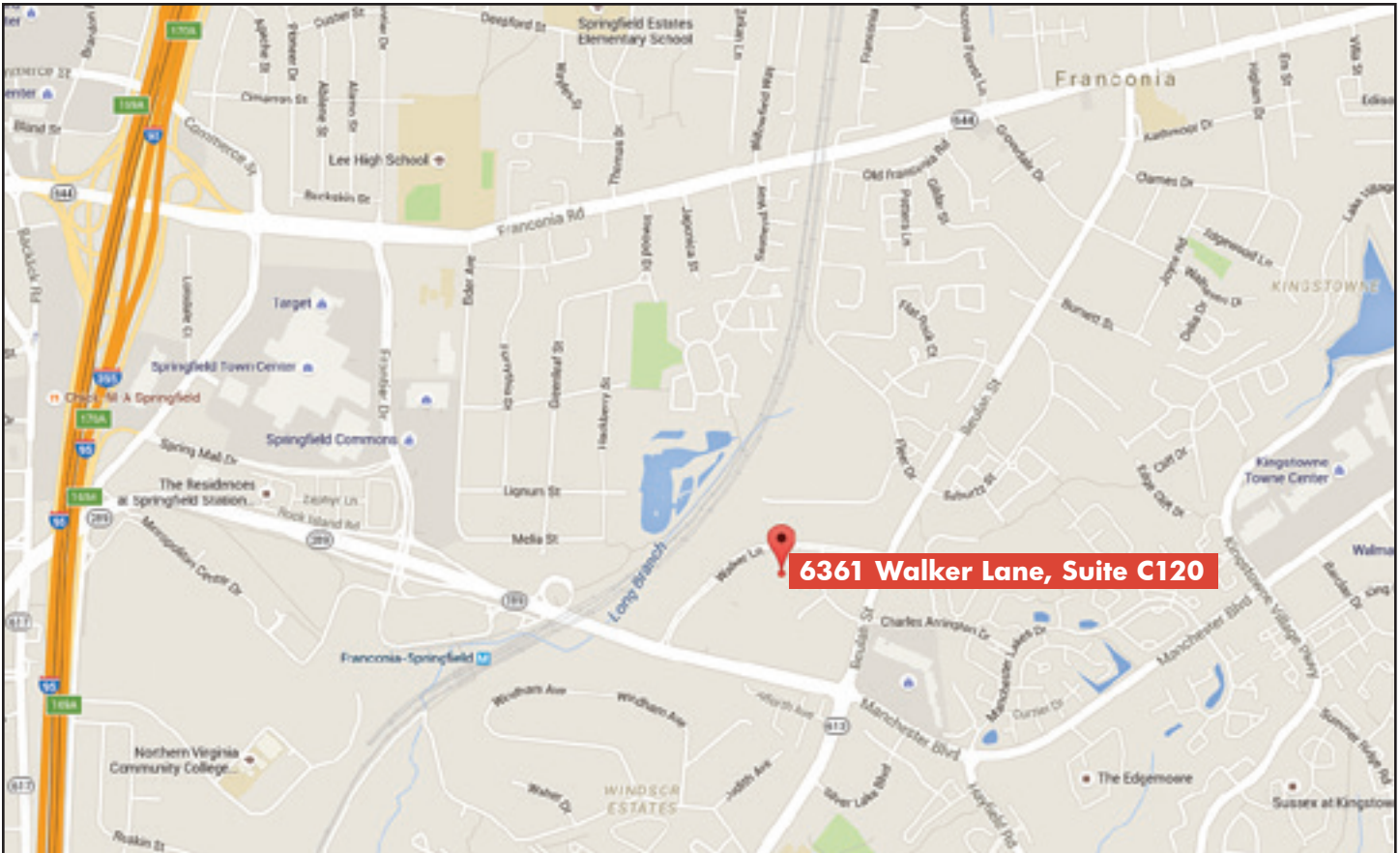
Large-scale-area map at left, close-up map below.

Take Fairfax County Parkway to the intersection of John J. Kingman Road. Turn right off of John J. Kingman Road into the parking lot accessway. Note that there are security guards who will issue you a pass. Park in designated areas only.

DTRA is a secured facility. You will require permission to enter the building; please see Security at the entrance.



Map to HQ DTRA CBRNE M&S Training Center Alexandria, VA



Large-scale-area map above,
close-up map at right.

CBRN Classes taught at DTRA CBRNE M&S Training Center

6361 Walker Lane, Suite C120
Alexandria, Virginia 22310
(571) 303-2171





Reference Material

Nuclear Deterrence Works

Nuclear weapons deter potential adversaries every single day. The 2018 Nuclear Posture Review states:

“The fundamental reasons why U.S. nuclear capabilities and deterrence strategies are necessary for U.S., allied, and partner security are readily apparent. U.S. nuclear capabilities make essential contributions to the deterrence of nuclear and non-nuclear aggression. The deterrence effects they provide are unique and essential to preventing adversary nuclear attacks, which is the highest priority of the United States.”

The U.S. Nuclear Enterprise remains at the forefront of national security and international stability. However, it is clear that nuclear competitors such as Russia, China, and the Democratic Peoples of North Korea (DPRK) have modernized their respective nuclear forces while also taking actions that could be interpreted as provocative or destabilizing. There are also multiple signals that indicate Russia, China, and DPRK have “integrated” their nuclear and conventional forces. It is intolerable to allow nuclear competitors to gain any advantage over the U.S.

The Defense Nuclear Weapons School (DNWS) ensures those across the U.S. Nuclear Enterprise have access to the nation’s highest quality training. For more than 70 years, DNWS’s mission has been “to provide training, both resident and non-resident, in support of nuclear weapons training programs worldwide; [and] to be responsive to requests for training services and support required to meet the needs of all DOD components and other cognizant agencies.” The school offers an array of courses that satisfy existing and address emergent requirements across the enterprise. The skilled DNWS staff coordinates with many facets of the community and is quick to respond to all requests, from those of individual technicians and responders to those of executive-level leaders and policy-makers.

The January 2020 DOD Dictionary of Military and Associated Terms defines deterrence as “the prevention of action by the existence of a credible threat of unacceptable counteraction and/or belief that the cost of action outweighs the perceived benefits.” Many agree the basic foundation of successful deterrence is built upon capability, credibility, and communication. As these three elements are optimally applied, we will continue to deter potential adversaries and assure our partners and allies.

Key to the U.S. deterrence mission is the continued maintenance of the Strategic Nuclear Triad.

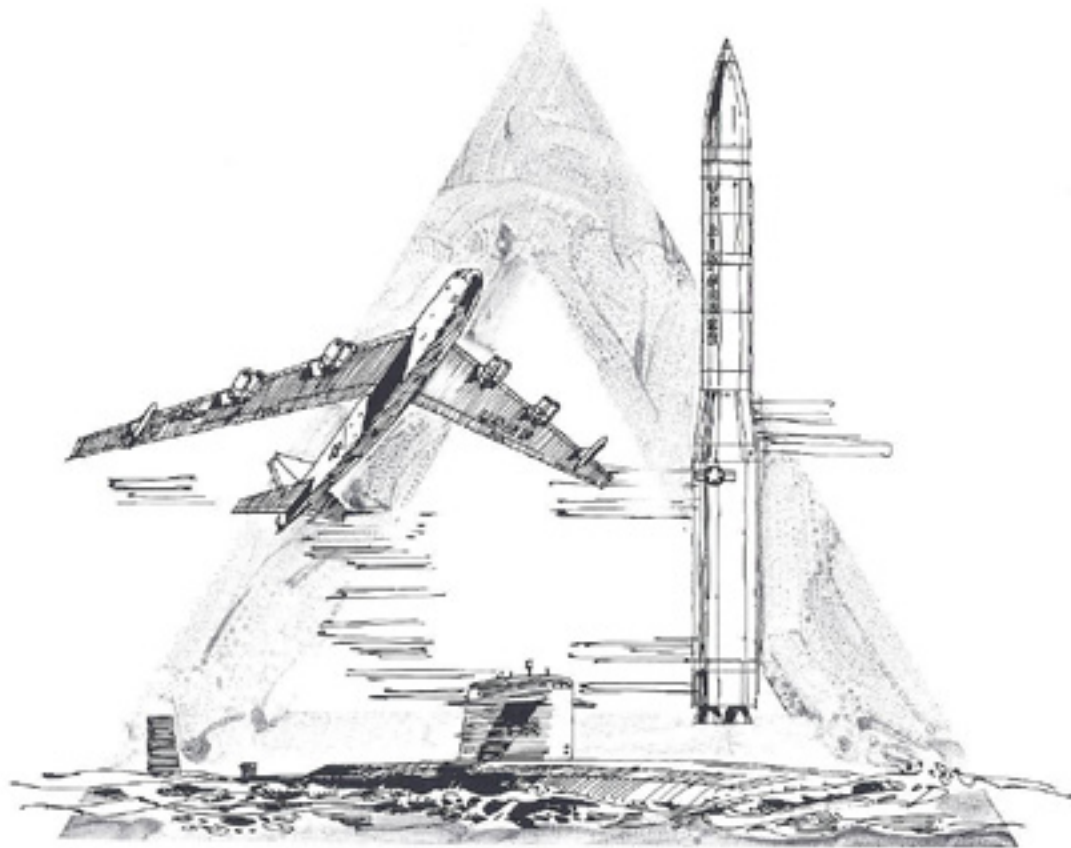


Image courtesy of the Atomic Heritage Foundation

The 2020 Nuclear Matters Handbook states the key attributes of the Nuclear Triad are: “SSBNs are survivable. A portion of the SSBN fleet is always on patrol, making it very difficult to track U.S. ballistic missile submarines, which means they are highly survivable. ICBMs are responsive. ICBMs are deployed in hundreds of nuclear hardened silos and can be launched to reach targets within minutes, creating a complex targeting problem for adversaries. U.S. strategic bombers are a “show of force.” Bombers are a clear and visible signal of U.S. intent and resolve during a crisis and provide a variety of deployment and yield options. Bombers may also be recalled.”



The 2018 Nuclear Posture Review (Pg II) states:

“To this end, this review confirms the findings of previous NPRs that the nuclear triad—supported by North Atlantic Treaty Organization (NATO) dual-capable aircraft and a robust nuclear command, control, and communications system—is the most cost-effective and strategically sound means of ensuring nuclear deterrence. The triad provides the President flexibility while guarding against technological surprise or sudden changes in the geopolitical environment. To remain effective, however, we must recapitalize our Cold War legacy nuclear forces.”



The above statement articulates it is the relationship of many different components that contribute to ensuring deterrence. The U.S. Nuclear Enterprise ensures that the U.S. and its allies/partners have confidence that the most dangerous potential adversaries are deterred. Please visit the Nuclear Enterprise Branch class synopsis’ pages 12-14 for more information about current DNWS curriculum that may address your nuclear literacy pursuits.



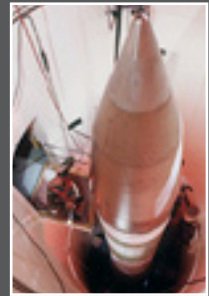
U.S. Enduring Stockpile

Bomb	Description	Carrier	Laboratories	Mission	Military Service
B61-3/4	Non-Strategic Bomb	F-15, F-16, & Tornado	LANL	Air to Surface	USAF
B61-7/11	Strategic Bomb	B2	LANL	Air to Surface	USAF



B61

Warhead	Description	Carrier	Laboratories	Mission	Military Service
W78-0	ICBM Warhead	Minuteman III ICBM	LANL	Surface to Surface	USAF
W87-0	ICBM Warhead	Minuteman III ICBM	LLNL	Surface to Surface	USAF



Minuteman III

Warhead	Description	Carrier	Laboratories	Mission	Military Service
W76-0/1/2	SLBM Warhead	Trident II D5 SLBM	LANL	Underwater to Surface	USN
W88-0	SLBM Warhead	Trident II D5 SLBM	LANL	Underwater to Surface	USN



TRIDENT II D5LE

Bomb	Description	Carrier	Laboratories	Mission	Military Service
B83-1	Strategic Bomb	B-2	LLNL	Air to Surface	USAF



B83

Warhead	Description	Carrier	Laboratories	Mission	Military Service
W80-1	Cruise Missile Warhead	B-52	LLNL	Air to Surface	USAF

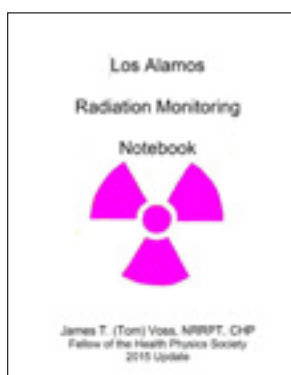
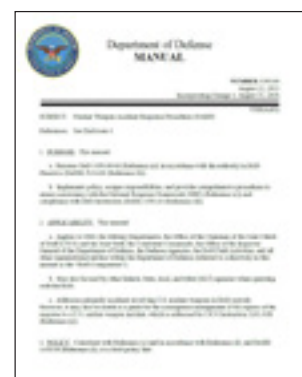
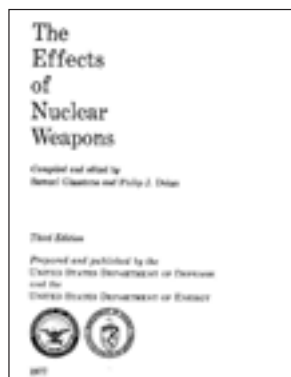
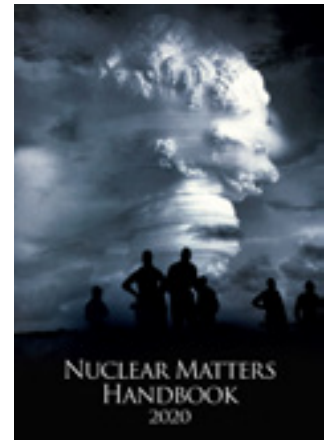


W80-1

Source: Sandia Military Liaison. (2013, September) *Enduring Stockpile*, SAND 2013-3463 P

References

- Nuclear Matters Handbook: <https://www.acq.osd.mil/ncbdp/nm/>
- The Effects of Nuclear Weapons: <https://www.osti.gov/servlets/purl/6852629>
- Manhattan Project General Information: <https://www.osti.gov/opennet/manhattan-project-history/Resources/library.htm>
- A Primer on U.S. Strategic Nuclear Policy: <https://www.osti.gov/biblio/776355>
- 2018, Nuclear Posture Review: https://dod.defense.gov/News/Special-Reports/0218_npr/
- Treaty on the Non-Proliferation of Nuclear Weapons (NPT): <https://www.state.gov/nuclear-nonproliferation-treaty/>
- Treaties and Agreements: <https://www.state.gov/nuclear-nonproliferation-treaty/>
- Interim National Security Strategic Guidance: <https://www.whitehouse.gov/wp-content/uploads/2021/03/NSC-1v2.pdf>
- National Security Strategy: <https://www.whitehouse.gov/wp-content/uploads/2017/12/NSS-Final-12-18-2017-0905.pdf>
- National Defense Strategy: <http://nssarchive.us/national-defense-strategy-2018/>
- Center for Strategic and International Studies: <https://www.csis.org/programs/international-security-program/project-nuclear-issues>
- Stockpile Stewardship and Management Plan (SSMP): <https://www.energy.gov/nnsa/downloads/stockpile-stewardship-and-management-plan-ssmp>
- Los Alamos Radiation Monitoring Handbook: http://www.nrrpt.org/file/Los%20Alamos%20Radiation%20Monitoring%20Notebook%202011_.pdf
- DoDD 3150.08 DoD Response to Nuclear and Radiological Accidents: <https://www.esd.whs.mil/Portals/54/Documents/DD/issuances/dodd/315008p.pdf?ver=hy5h7iNjQ-JT6WlU18nmb4A%3D%3D>
- DoDI 3150.10 DoD Response to U.S. Nuclear Weapon Incidents: <https://www.esd.whs.mil/Portals/54/Documents/DD/issuances/dodi/315010p.pdf?ver=2018-10-11-075001-377>
- DoDM 3150.08 Nuclear Weapon Accident Response Procedures (NARP): <https://www.esd.whs.mil/Portals/54/Documents/DD/issuances/dodm/315008m.pdf?ver=2018-10-05-090638-530>
- DOD 3150.08-M "Nuclear Weapon Accident Response Procedures (NARP) Internet Supplement <https://www.acq.osd.mil/ncbdp/nm/narp/index.htm>



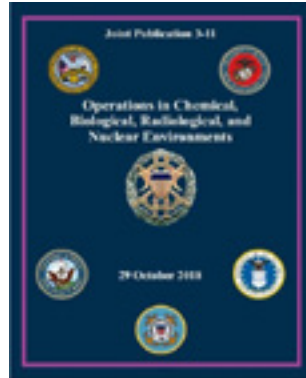
Key DOD CWMD/CBRN References



Joint Publications



JP 3-40 Countering Weapons of Mass Destruction
27 November 2019



JP 3-11 Operations in Chemical, Biological, Radiological, and Nuclear Environments
29 October 2018



JP 3-41 CBRN Response
9 September 2016

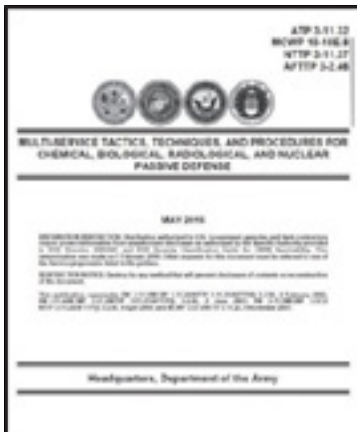


JP 3-28 Defense Support of Civil Authorities
29 October 2018

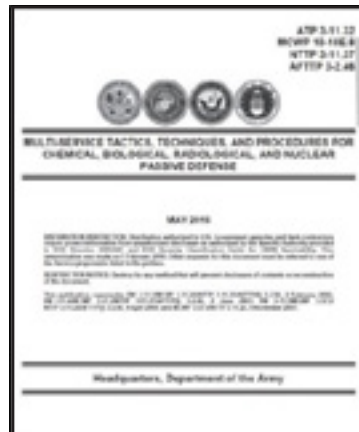
All Joint Publications are available through the Joint Chiefs of Staff Website:

<https://www.jcs.mil/Doctrine/Joint-Doctrine-Pubs/3-0-Operations-Series/>

Multi-Service References on Threats and Tactics, Techniques and Procedures



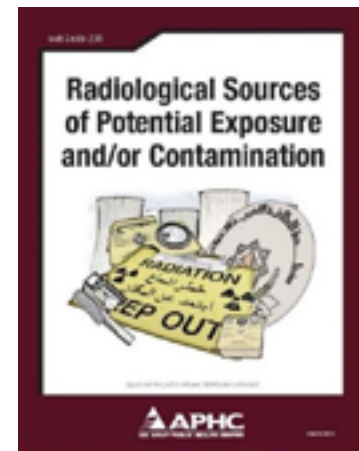
Multi-Service Tactics, Techniques and Procedures for CBRN Passive Defense
May 2016



CBRN Threats and Hazards
December 2017

Both references are For Official Use Only, please go to your appropriate service e-publication website.

Radiological Sources of Potential Exposure and/or Contamination



Tech Guide 238

Available from the Army Public Health Center

<https://phc.amedd.army.mil/Pages/default.aspx>

Additional Guidance and References:

Presidential Policy Directive 8: <https://www.dhs.gov/presidential-policy-directive-8-national-preparedness>

DoDD 2060.02 DoD Countering Weapons of Mass Destruction:

https://www.esd.whs.mil/Portals/54/Documents/DD/issuances/dodd/206002_dodd_2017.Pdf

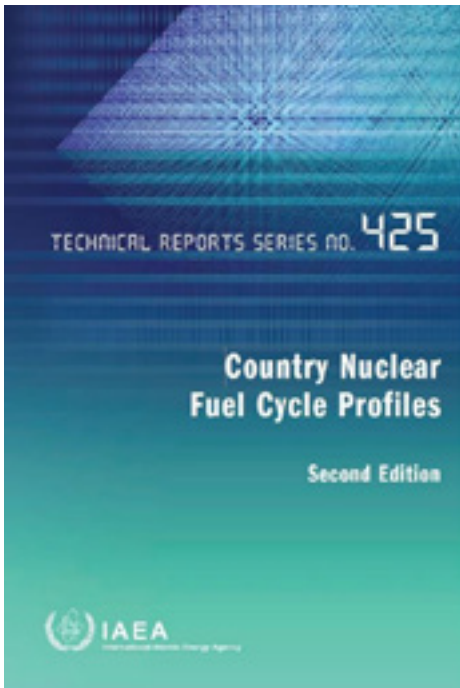
DoDD 3025.18 Defense Support to Civil Authorities (DSCA):

<https://www.esd.whs.mil/Portals/54/Documents/DD/issuances/dodd/302518p.pdf>

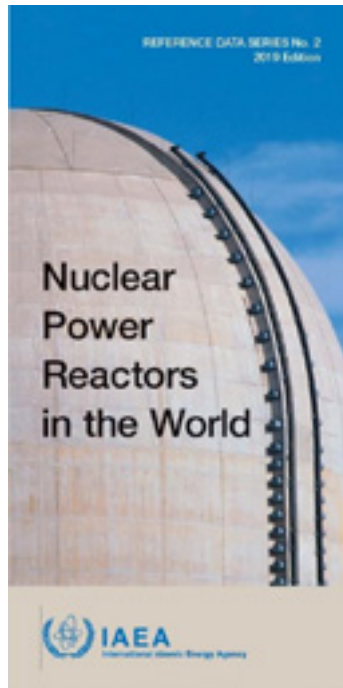
National Response Framework: <https://www.fema.gov/media-library/assets/documents/117791>

National Incident Management System: <https://www.fema.gov/national-incident-management-system>

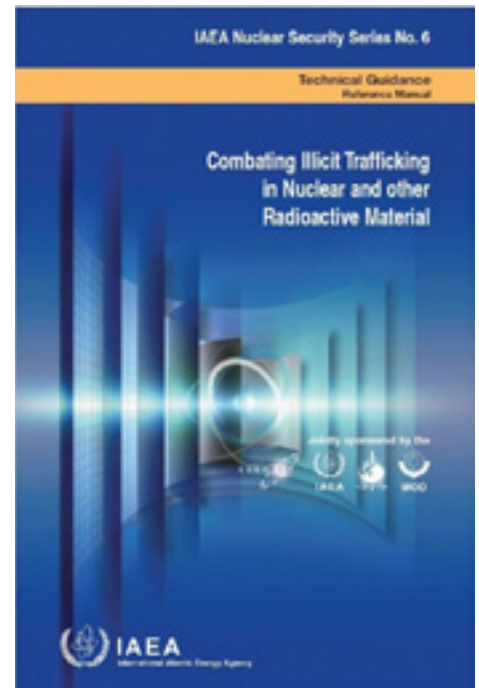
International Atomic Energy Agency (IAEA) Radiological & Nuclear References



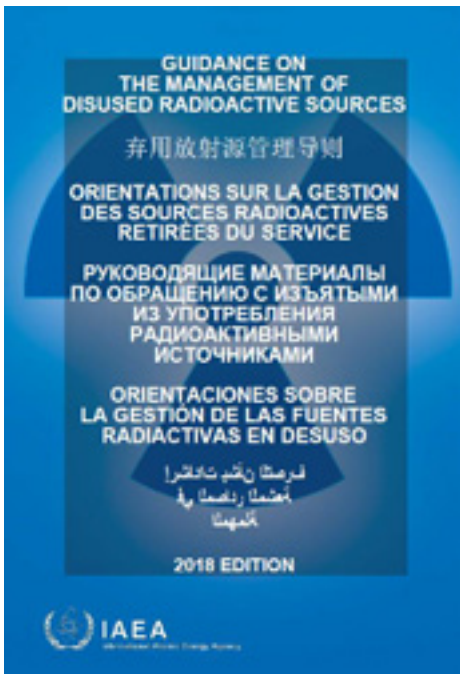
[Country Nuclear Fuel Cycle Profiles - Second Edition](#)



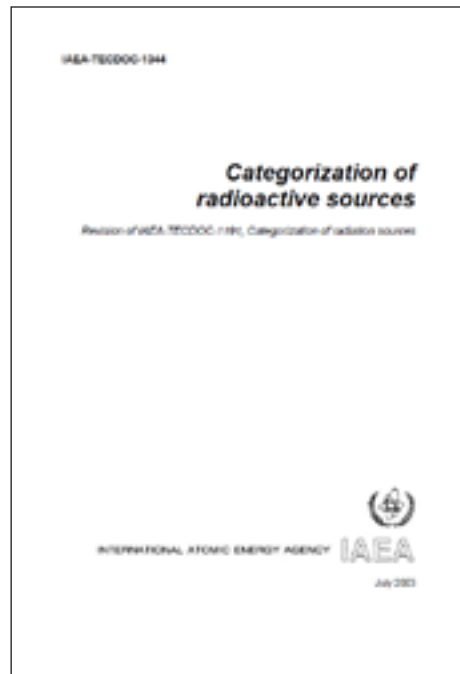
[Nuclear Power Reactors in the World](#)



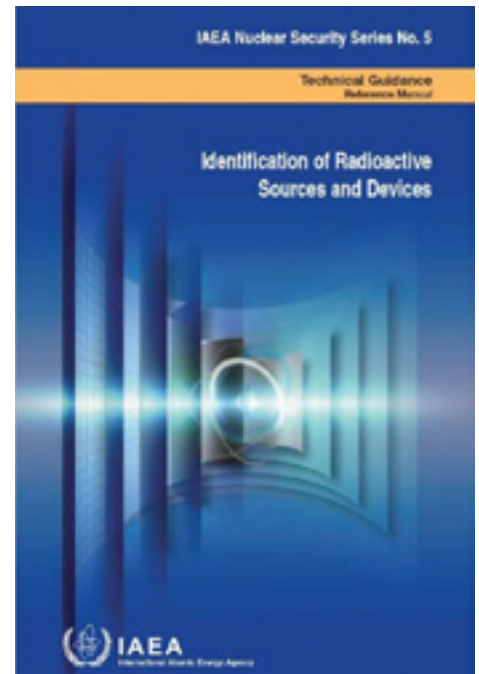
[Combating Illicit Trafficking in Nuclear and other Radioactive Material](#)



[Guidance on the Management of Disused Radioactive Sources](#)



[Categorization of Radioactive Sources](#)



[Identification of Radioactive Sources and Devices](#)

A selection of current response guides and references for Radiological Dispersal Device (RDD) and Nuclear Detonation for U.S. responders and emergency planners.

Map of Contamination Zones: Shows Initial 50-mile Plume Zone (500 m at 1000 ft) and Initial 100-mile Plume Zone (500 m from release). Includes a legend and a grid with a 'Direction of Contamination' arrow.

Flowchart of Response Tactics:

- FIELD RESPONSE TACTICS:**
 - Initial Units & On Scene Reconnaissance
 - Confirm Presence of Radiation
 - Give Report from Scene
 - Secure and Manage the Scene
 - Measure Radiation Levels
 - Commence Phased Evacuations
 - Monitor and Decontaminate
- EOC/COMMAND CENTER TACTICS:**
 - Issue Protective Orders to Public through Media Outlets (Public Messages 1-3)
 - Notify Partners and Request Assistance
 - Consolidate and Map Radiation Data

Response Phases:

- EARLY (Emergency Response):** 0 to 30 miles
- INTERMEDIATE (Incident Stabilization):** 30 to 500 miles

Book Cover: Radiological Dispersal Device (RDD) Response Guidance
 Planning for the First 100 Minutes
 November 2017
 Includes logos for FEMA, NRC, and other agencies.

Book Covers:

- Planning Guidance for Response to a Nuclear Detonation** (Second Edition, June 2010)
- Quick Reference Guide: Radiation Risk Information for Responders Following a Nuclear Detonation** (December 2016)

Zoned Response Diagram:

- LD MD SD:** Light, Moderate, Severe Damage
- LF = Light Damage Zone**
- MF = Moderate Damage Zone**
- SF = Severe Damage Zone**
- DF = Dangerous Fallout Zone**
- DF:** Distance from detonation
- Radius:** ~10 to 20 miles

Zoned Response Text:

There will be two different kinds of zones: Damage & Fallout zones. Response organizations will use these zones to establish official zones (These distance estimates are for a 15 KT RDD, ground burst)

Severe Damage – 0 to 0.5 mi. Buildings completely destroyed, radiation is too high to enter for 72 hours, survival unlikely

Moderate Damage – 0.5 to 1 mi. Significant building damage, rubble, damaged power lines, overturned vehicles, limited visibility for the first hour or more due to dirt and smoke, serious injuries, best surviving opportunities.

Light Damage – 1 to 3 mi. Windows mostly broken, injuries not expected to be life-threatening

Fallout Zones:

Fallout zones change with time. As the fallout is spread by wind the area expands. After the initial deposition, the zones shrink as the radioactivity decays.

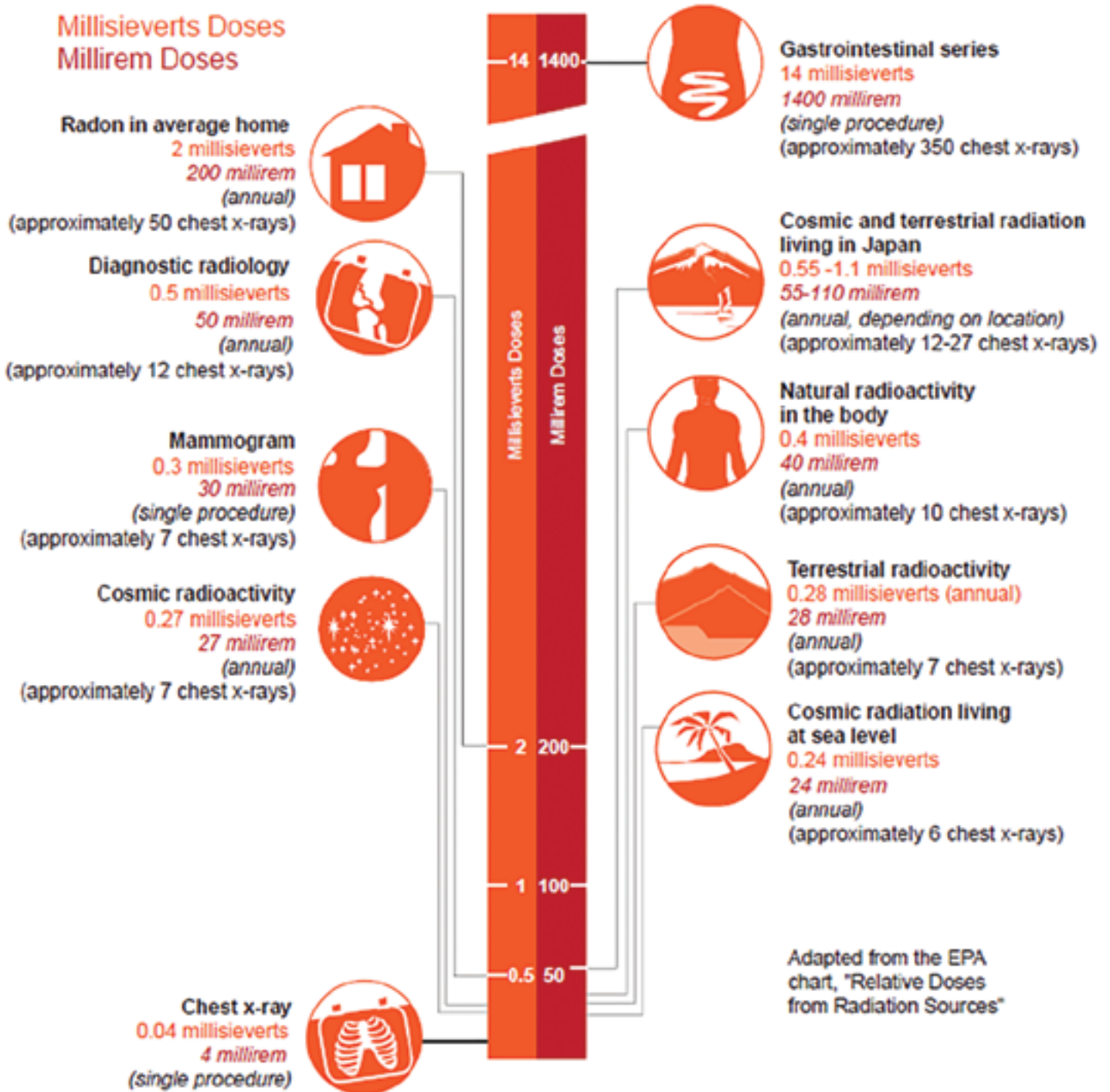
Dangerous Fallout zone – up to 20 mi from ground zero: Radioactive dust from the explosion create radiation levels exceeding 10 R/hr (see table) (0.1 Gy/h), not limited to damage zones, workers taking them must be justified, planned and always kept As Low As Reasonably Achievable (ALARA); time-sensitive, mission-critical activities such as treating identified injured survivors. Advise other survivors to shelter in place.

Elevated radiation area – up to several hundreds of miles: from 0.01 R/hr to 10 R/hr (0.0001 to 0.1 Gy/h), potentially hazardous, and cumulative radiation exposure should be monitored.



Relative Doses from Common Radiation Sources

Millisieverts Doses
Millirem Doses



Adapted from the EPA chart, "Relative Doses from Radiation Sources"

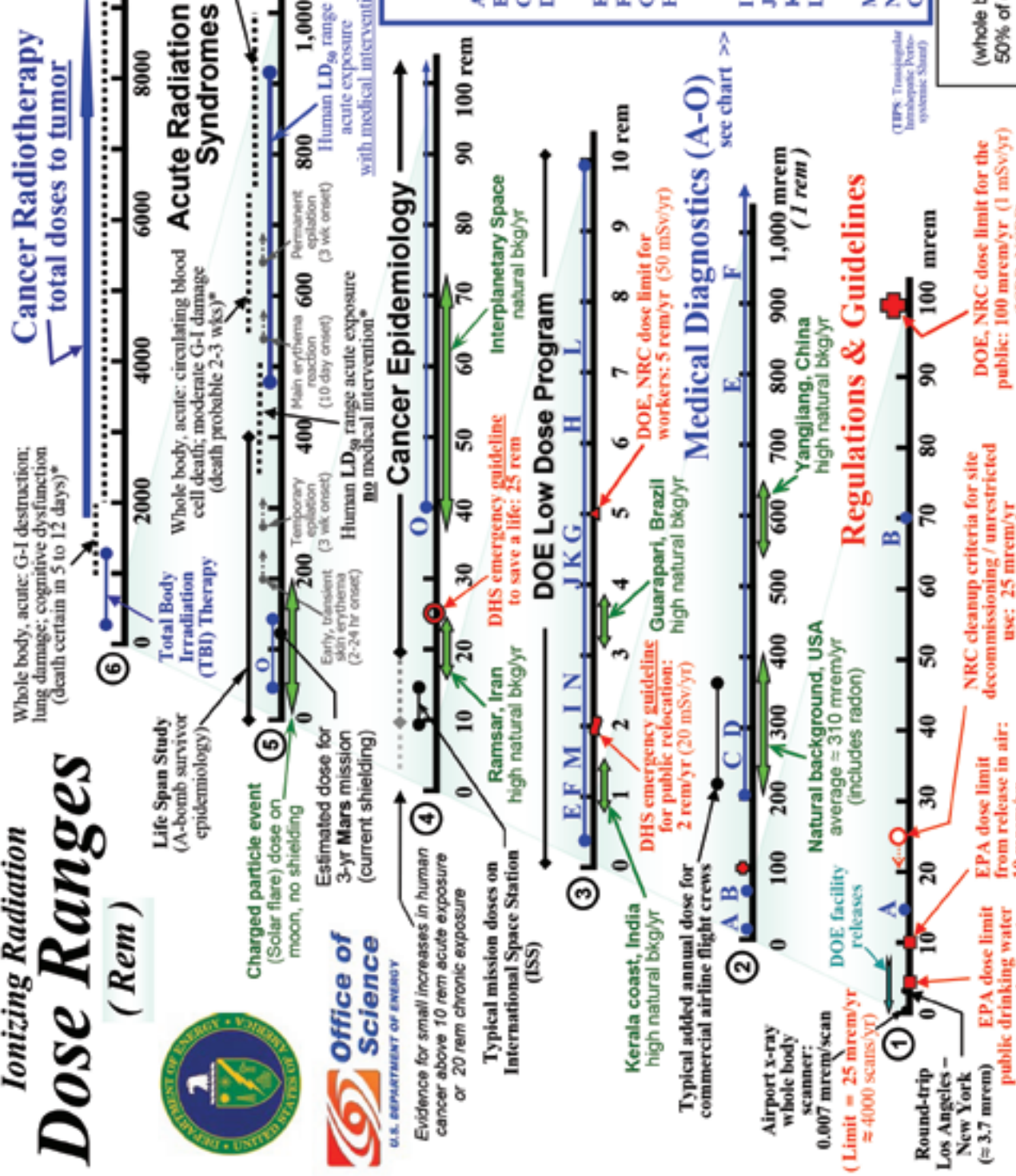
REM (Roentgen equivalent man): One of the two standard units used to measure the dose equivalent (or effective dose), which combines the amount of energy (from any type of ionizing radiation that is deposited in human tissue), along with the medical effects of the given type of radiation. The SI unit for dose equivalent is the Sievert.

Ref. <https://www.nrc.gov/reading-rm/basic-ref/glossary/rem-roentgen-equivalent-man.html>

Ionizing Radiation Dose Ranges (Rem)



U.S. DEPARTMENT OF ENERGY
OFFICE OF SCIENCE



Source: Office of Biological and Environmental Research (BER), Office of Science, U.S. Department of Energy
http://www.science.doe.gov/ber

NOTE: This chart was constructed with the intention of providing a simple, use-friendly, "order-of-magnitude" reference for radiation exposures of interest to scientists, managers, and the general public. In that spirit, most quantities are expressed as "dose equivalent" in the more commonly used radiological protection units, the rem and sievert. Medical diagnostics are expressed as estimated maximum organ dose, as they are not in "effective dose" they do not imply an estimation of risk (no tissue weighting). Dose limits are in effective dose, but for most radiation types and energies the difference is numerically not significant within this context. It is acknowledged that the decision to use these units is a simplification, and does not address everyone's needs. (NRC = Nuclear Regulatory Commission; EPA = Environmental Protection Agency; DHS = Department of Homeland Security) Disclaimer: Neither the United States Government nor any agency thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information disclosed.

LD₅₀ = Lethal Dose to 50%
(whole body dose that results in lethality to 50% of exposed individuals in 30-60 days)

Dose Equivalent: 100 rem = 1 Sievert
= (absorbed dose x radiation quality)

Absorbed Dose: 100 rad = 1 Gray

Chart compiled by NF Meeting, Office of Science, DOE/BER, "Orders of Magnitude" revised June 2010 1 rem ≈ 1 rad for x- and gamma-rays (⁶⁰Co) stands for "approximately equal to")

<http://www.law.dose.cerfrc.gov/>

Regulations & Guidelines

DOE, NRC dose limit for the public: 100 mrems/yr (1 mSv/yr) (ICRP, NCRP)

NRC cleanup criteria for site decommissioning / unrestricted use: 25 mrems/yr

EPA dose limit from release in air: 10 mrems/yr

EPA dose limit from release in water systems: 4 mrems/yr

DOE facility releases

Natural background, USA average = 310 mrems/yr (includes radon)

Yangliang, China high natural bkg/yr

Guarapari, Brazil high natural bkg/yr

DHS emergency guideline for public relocation: 2 rem/yr (20 mSv/yr)

DHS emergency guideline for workers: 5 rem/yr (50 mSv/yr)

DOE, NRC dose limit for workers: 5 rem/yr (50 mSv/yr)

CEPS: Transingular Interspecific Pericardial Systemic Status

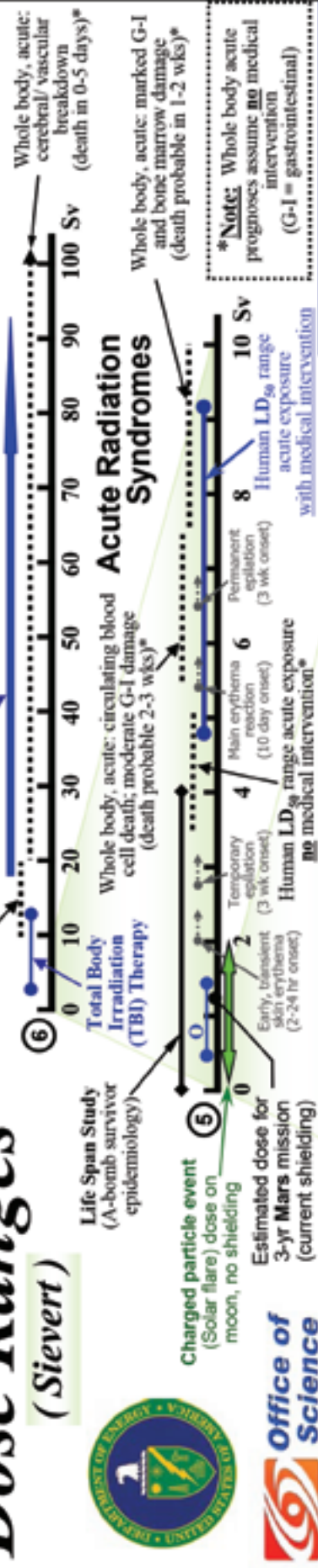
Ionizing Radiation Dose Ranges (Sievert)



U.S. DEPARTMENT OF ENERGY
Office of Science

Whole body, acute: G-I destruction; lung damage; cognitive dysfunction (death certain in 5 to 12 days)*

Cancer Radiotherapy
total doses to tumor



Whole body, acute: cerebral/vascular breakdown (death in 0-5 days)*

Whole body, acute: circulating blood cell death; moderate G-I damage (death probable 2-3 wks)*

Whole body, acute: G-I destruction; lung damage; cognitive dysfunction (death certain in 5 to 12 days)*

Whole body, acute: marked G-I and bone marrow damage (death probable in 1-2 wks)*

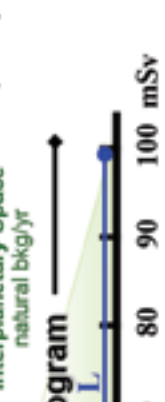
*Note: Whole body acute prognoses assume no medical intervention (G-I = gastrointestinal)

Medical Diagnostics (A-O)

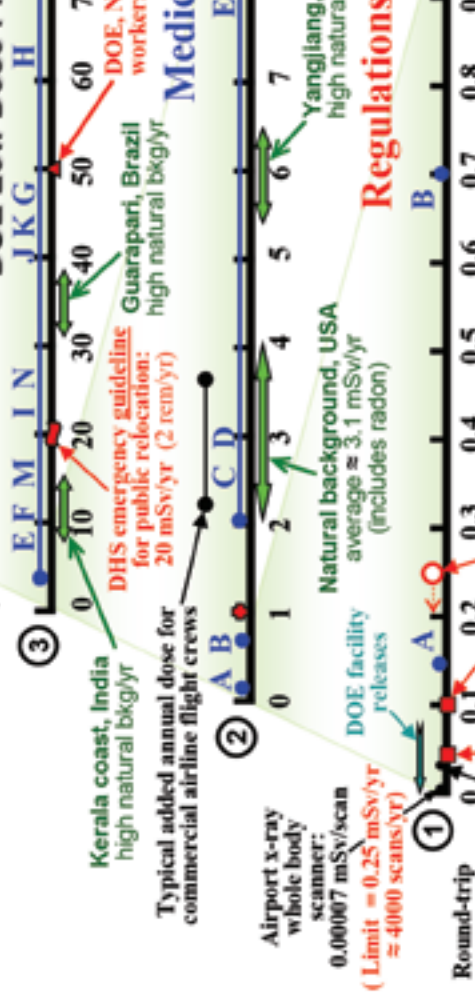
(Estimated maximum organ dose)

A - Chest (PA & Lat)	0.14
B - Dental Panoramic	0.7
C - Lumbar-Sacral Spine	2-3
D - Mammogram	2-4
E - Heart Stress (Tc-99m)	6-12
F - Bone (Tc-99m)	4-15
G - Dual Isotope Stress Test	40-45
H - PET; F-18 FDG (bladder)	55-80
CT Scans (X-ray)	
(multiple scan average dose)	
I - Chest CT	20-30
J - Head CT	30-50
K - Abdominal CT	22-60
L - Full Body CT	50-100
Fluoroscopy/Procedures	
M - Barium Contrast G.I.	10-22
N - Cardiac Catheterization	12-40
O - TIPS Procedure	400-1400

Cancer Epidemiology



Regulations & Guidelines



LD₅₀ = Lethal Dose to 50%
(whole body dose that results in lethality to 50% of exposed individuals in 30-60 days)

Dose Equivalent: 1 Sievert = 100 rem
= (absorbed dose x radiation quality)
Absorbed Dose: 1 Gray = 100 rad
1 Sv = 1 Gy for x- and gamma-rays
(* "as" stands for "approximately equal to")

NOTE: This chart was constructed with the intention of providing a simple, use-friendly, "order-of-magnitude" reference for radiation exposures of interest to scientists, managers, and the general public. In that spirit, most quantities are expressed as "dose equivalents" to the more commonly used radiation protection units, the rem and sievert. Medical diagnostics are expressed as estimated maximum organ dose, as they are not in "effective dose" they do not imply an estimation of risk (no tissue weighting). Dose limits are in effective dose, but for most radiation types and energies the difference is immaterially not significant with this context. It is acknowledged that the decision to use these units is a simplification, and does not address everyone's needs. (NSC = Nuclear Regulatory Commission; EPA = Environmental Protection Agency; DHS = Department of Homeland Security) Disclaimer: Neither the United States Government nor any agency thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information disclosed.

Chart compiled by NF Meeting, Office of Science, DOE/BER, "Orders of Magnitude" revised June 2010
<http://www.law.dose.energy.gov/>

Gamma Radiation Dose Rate Conversions

	roentgen per hour (R/h)	rem per hour (rem/h)	sievert per hour (Sv/h)	gray per hour (Gy/h)	centigray per hour (cGy/h)	rad per hour (rad/h)	rem per hour (without prefixes) (rem/h)	sievert per hour (without prefixes) (Sv/h)	
	1 μ R/h	1 μ rem/h	10 nSv/h 0.01 μ Sv/h	0.01 μ Gy/h	0.000001 cGy/h	1 μ rad/h	0.000001 rem/h	0.00000001 Sv/h	
Bkg	10 μ R/h	10 μ rem/h	100 nSv/h 0.10 μ Sv/h	0.10 μ Gy/h	0.000010 cGy/h	10 μ rad/h	0.000010 rem/h	0.00000010 Sv/h	
	50 μ R/h	50 μ rem/h	0.50 μ Sv/h 500 nSv/h	0.50 μ Gy/h	0.000050 cGy/h	50 μ rad/h	0.000050 rem/h	0.00000050 Sv/h	
	100 μ R/h 0.1 mR/h	100 μ rem/h 0.1 mrem/h	1000 nSv/h 1 μ Sv/h	1 μ Gy/h	0.00010 cGy/h	100 μ rad/h	0.00010 rem/h	0.0000010 Sv/h	
	500 μ R/h	500 μ rem/h	5 μ Sv/h	5 μ Gy/h	0.00050 cGy/h	500 μ rad/h	0.00050 rem/h	0.0000050 Sv/h	
	750 μ R/h	750 μ rem/h	7.5 μ Sv/h	7.5 μ Gy/h	0.00075 cGy/h	750 μ rad/h	0.00075 rem/h	0.0000075 Sv/h	
SET UP HOT LINE CAUTION	1000 μ R/h 1 mR/h	1000 μ rem/h 1 mrem/h	10 μ Sv/h	10 μ Gy/h	0.0010 cGy/h	1000 μ rad/h 1 mrad/h	0.0010 rem/h	0.000010 Sv/h	
	2 mR/h	2 mrem/h	20 μ Sv/h	20 μ Gy/h	0.0020 cGy/h	2 mrad/h	0.0020 rem/h	0.000020 Sv/h	
	5 mR/h	5 mrem/h	50 μ Sv/h	50 μ Gy/h	0.0050 cGy/h	5 mrad/h	0.0050 rem/h	0.000050 Sv/h	
	7.5 mR/h	7.5 mrem/h	75 μ Sv/h	75 μ Gy/h	0.0075 cGy/h	7.5 mrad/h	0.0075 rem/h	0.000075 Sv/h	
	10 mR/h	10 mrem/h	100 μ Sv/h 0.1 mSv/h	100 μ Gy/h 0.1 mGy/h	0.010 cGy/h	10 mrad/h	0.010 rem/h	0.00010 Sv/h	
WORK IN HOT ZONE	CAUTION	20 mR/h	20 mrem/h	200 μ Sv/h	200 μ Gy/h	0.020 cGy/h	20 mrad/h	0.020 rem/h	0.00020 Sv/h
		30 mR/h	30 mrem/h	300 μ Sv/h	300 μ Gy/h	0.030 cGy/h	30 mrad/h	0.030 rem/h	0.00030 Sv/h
		40 mR/h	40 mrem/h	400 μ Sv/h	400 μ Gy/h	0.040 cGy/h	40 mrad/h	0.040 rem/h	0.00040 Sv/h
		50 mR/h	50 mrem/h	500 μ Sv/h	500 μ Gy/h	0.050 cGy/h	50 mrad/h	0.050 rem/h	0.00050 Sv/h
		75 mR/h	75 mrem/h	750 μ Sv/h	750 μ Gy/h	0.075 cGy/h	75 mrad/h	0.075 rem/h	0.00075 Sv/h
	DANGER	100 mR/h 0.1 R/h	100 mrem/h 0.1 rem/h	1000 μ Sv/h 1 mSv/h	1000 μ Gy/h 1 mGy/h	0.10 cGy/h	100 mrad/h	0.10 rem/h	0.0010 Sv/h
		200 mR/h	200 mrem/h	2 mSv/h	2 mGy/h	0.20 cGy/h	200 mrad/h	0.20 rem/h	0.0020 Sv/h
		300 mR/h	300 mrem/h	3 mSv/h	3 mGy/h	0.30 cGy/h	300 mrad/h	0.30 rem/h	0.0030 Sv/h
		400 mR/h	400 mrem/h	4 mSv/h	4 mGy/h	0.40 cGy/h	400 mrad/h	0.40 rem/h	0.0040 Sv/h
		500 mR/h	500 mrem/h	5 mSv/h	5 mGy/h	0.50 cGy/h	500 mrad/h	0.50 rem/h	0.0050 Sv/h
	DANGER	750 mR/h	750 mrem/h	7.5 mSv/h	7.5 mGy/h	0.75 cGy/h	750 mrad/h	0.75 rem/h	0.0075 Sv/h
		1000 mR/h 1 R/h	1000 mrem/h 1 rem/h	10 mSv/h	10 mGy/h	1.0 cGy/h	1000 mrad/h 1 rad/h	1.0 rem/h	0.010 Sv/h
		1.5 R/h	1.5 rem/h	15 mSv/h	15 mGy/h	1.5 cGy/h	1.5 rad/h	1.5 rem/h	0.015 Sv/h
		2 R/h	2 rem/h	20 mSv/h	20 mGy/h	2 cGy/h	2 rad/h	2 rem/h	0.02 Sv/h
		3 R/h	3 rem/h	30 mSv/h	30 mGy/h	3 cGy/h	3 rad/h	3 rem/h	0.03 Sv/h
LIFE-SAVING ONLY	DANGER	4 R/h	4 rem/h	40 mSv/h	40 mGy/h	4 cGy/h	4 rad/h	4 rem/h	0.04 Sv/h
		5 R/h	5 rem/h	50 mSv/h	50 mGy/h	5 cGy/h	5 rad/h	5 rem/h	0.05 Sv/h
		7.5 R/h	7.5 rem/h	75 mSv/h	75 mGy/h	7.5 cGy/h	7.5 rad/h	7.5 rem/h	0.075 Sv/h
		10 R/h	10 rem/h	100 mSv/h	100 mGy/h	10 cGy/h	10 rad/h	10 rem/h	0.10 Sv/h
		20 R/h	20 rem/h	200 mSv/h	200 mGy/h	20 cGy/h	20 rad/h	20 rem/h	0.20 Sv/h
		30 R/h	30 rem/h	300 mSv/h	300 mGy/h	30 cGy/h	30 rad/h	30 rem/h	0.30 Sv/h
		40 R/h	40 rem/h	400 mSv/h	400 mGy/h	40 cGy/h	40 rad/h	40 rem/h	0.40 Sv/h
VOLUNTEERS GRAVE DANGER	DANGER	50 R/h	50 rem/h	500 mSv/h	500 mGy/h	50 cGy/h	50 rad/h	50 rem/h	0.50 Sv/h
		75 R/h	75 rem/h	750 mSv/h	750 mGy/h	75 cGy/h	75 rad/h	75 rem/h	0.75 Sv/h
		100 R/h	100 rem/h	1000 mSv/h 1 Sv/h	1000 mGy/h 1 Gy/h	100 cGy/h	100 rad/h	100 rem/h	1 Sv/h
		200 R/h	200 rem/h	2 Sv/h	2 Gy/h	200 cGy/h	200 rad/h	200 rem/h	2 Sv/h
		300 R/h	300 rem/h	3 Sv/h	3 Gy/h	300 cGy/h	300 rad/h	300 rem/h	3 Sv/h
		400 R/h	400 rem/h	4 Sv/h	4 Gy/h	400 cGy/h	400 rad/h	400 rem/h	4 Sv/h
		500 R/h	500 rem/h	5 Sv/h	5 Gy/h	500 cGy/h	500 rad/h	500 rem/h	5 Sv/h
		750 R/h	750 rem/h	7.5 Sv/h	7.5 Gy/h	750 cGy/h	750 rad/h	750 rem/h	7.5 Sv/h
		1000 R/h	1000 rem/h	10 Sv/h	10 Gy/h	1000 cGy/h	1000 rad/h	1000 rem/h	10 Sv/h

Notes: This table is intended to help convert and compare gamma radiation exposure and dose rate readings taken with different types of meters. It assumes the following conversion factors for gamma ray dose rates are used: 1 R/h = 1 rad/h = 1 rem/h and 1 Sv/h = 100 rem/h and 1 Gy/h = 100 rad/h. Meters using the traditional "special units" (R, rem, rad) often use abbreviate "hour" as "hr," while meters using SI units (Sv, Gy) often use "h" for "hour." Natural Background radiation levels are usually around 5 to 25 μ R/h (0.05 to 0.25 μ Sv/h), and are represented by the row labeled "Bkg" 10 μ R/h (100 nSv/h).

Radiation Dose Rate Guidance

DOSE RATE Recommendations	Values
Contaminated Persons¹	2 x Background Reading (cpm or μR/h or mR/h)
Limit of Radioactive "Plume" on the Ground or Air²	5 x Background Reading (cpm or μR/h or mR/h)
Establish Hot Line³ CAUTION	1 mR/h to 10 mR/h (0.001 R/h to 0.010 R/h)
Work in Hot Zone CAUTION - DANGER	Hot Line up to 10 R/h (up to 10,000 mR/h)
Turn-Around Dose Rate For NON-Life-Saving⁴ DANGER	10 R/h
Turn-Around Dose Rate for LIFE-SAVING⁵ DANGER	100 R/h
Life-Saving, Very Short Duration Only (Informed Volunteers)⁵ GRAVE DANGER	More than 100 R/h

¹ EPA *Manual of Protective Action Guides and Protective Actions for Nuclear Incidents* EPA 400-R-92-001

² DOE FRMAC *Monitoring and Analysis Manual Radiation Monitoring and Sampling*. DOE/NV/11718-181-VOL.1

³ See guidance from local or state authorities. ASTM (E 2601-08 *Standard Practice for Radiological Emergency Response*), NCRP (Commentary No. 19), and IAEA (EPR-First Responders 2006) recommend 10 mR/h. Many local jurisdictions use 2 mR/h.

⁴ NCRP *Management of Terrorist Events Involving Radioactive Material*, NCRP Report No. 138

DOE FRMAC uses 1.5 R/h for Turn-Around, unless otherwise directed. DOE/NV/11718-181-VOL.1

⁵ Adapted from ASTM (E 2601-08 *Standard Practice for Radiological Emergency Response*),

Federal Interagency Committee (*Planning Guidance for Response to a Nuclear Detonation*, 2nd Edition), and DOE Los Alamos National Laboratory (LA-UR-99 *Emergency Medical Rescue in a Radiation Environment*)

See guidance from local or state authorities for maximum dose rate that can be entered for life-saving activities.

DHS/FEMA and EPA Emergency Worker Dose Guidelines

Dose limit (whole body)		Emergency Action Dose Guidelines Activity performed
5,000 mrem	5 rem	All activities.
10,000 mrem	10 rem	Protecting major property.
25,000 mrem	25 rem	Lifesaving or protection of large populations.
More than 25,000 mrem	More than 25 rem	Lifesaving or protection of large populations, Only by volunteers who understand the risks.

Dose includes sum of external dose and dose due to internal contamination. Dose limits for eyes is 3 x the values listed above. Dose limit for any other organ (including skin and extremities) is 10 times the values listed above.

EPA *Manual of Protective Action Guides and Protective Actions for Nuclear Incidents* EPA 400-R-92-001

DHS/FEMA *Planning Guidance for Protection and Recovery Following Radiological Dispersal Device (RDD) and Improvised Nuclear Device (IND) Incidents*

Reactors in the USINDOPACOM Theater

Total #

130

29

38

● # of Power Reactors

● # Under Construction

● Research Reactors



USINDOPACOM



If you encounter something suspicious, follow your specific local protocols. Recommend contacting your state fusion center.

DNDO Joint Analysis Center (JAC)

For 24-hour Technical Assistance, contact: 1-877-363-6522 (1-877-DNDO-JAC)

Email: DNDO.JAC@dhs.gov

DNDO JAC Information Line (Non-emergency): 1-866-789-8304

Email: dndo.jac2@dhs.gov



Radiation Warning Symbol (Trefoil)



Dangerous Radiation Sources Symbol only on inside of device housing. If seen, device has been taken apart.

For repeatable neutron alarms

Neutron radiation is a primary indicator of plutonium (nuclear weapon material) and therefore warrants analysis. If the source of radiation cannot be authenticated, contact your local/state Technical Reachback center or the DNDO JAC.

When using Personal Radiation Detectors (PRDs)

1. Determine the precise location of the source of the radiation.
2. Visually inspect and interview all personnel associated with the alarm.

When using Radiation Isotope Identifier Devices (RIIDs)

1. Longer collection times (preferably 5 minutes) improve analysis results.
2. For the unknown or suspect radioactive item(s) being screened at site, note exposure rate (uR/h or mR/h), collection location, and distance from the item.
3. The RIID may fail to identify or may misidentify the isotopes present. It is important to understand common sources of radiation and have the capability to transmit data to Technical Reachback. Technical Reachback would like RIID spectrum data files on the local background, calibration source (if available), and the unknown or suspect radioactive item(s).

Release Conditions

The person or vehicle may be released upon completion of the following conditions:

1. Conclusive identification of the type and location of the radioactive item(s) as non-threat material (natural, medical, legitimate shipment, etc.).
2. Completion of all screening and assessments in accordance with local SOPs, including determining no threats are present.

Nuclear Concerns/Threats

1. Improvised Nuclear Device (IND) A device designed or constructed outside an official government agency and which has, appears to have, or is claimed to have the capability to produce a nuclear detonation. The term IND also applies to a stolen nuclear weapon potentially modified by a terrorist or non-governmental organization.

2. Radiological Dispersal Device (RDD) A device which has, appears to have, or is claimed to have, the capability to produce radioactive contamination over an area without a nuclear explosion. Also referred to as a "dirty bomb." Non-explosive dispersal methods include sprayers or powders placed in air ducts.



RDD (Simulated) Explosive Dispersal



RDD Aerosol Spray

3. Radiological Exposure Device (RED) A device that is intended to expose people to radiation without dispersal of radioactive material into the air by detonation with conventional explosives or other means. An example of a RED is unshielded or partially shielded radioactive materials placed in any type of container and in a location capable of causing a radiation exposure to one or more individuals.

IAEA RADIOLOGICAL SOURCE CATEGORIES

- CATEGORY 1 Potential of death or permanent injury of individuals who are in close proximity for minutes to hours.
- CATEGORY 2 Potential of death or permanent injury of individuals who are in close proximity hours to days
- CATEGORY 3 Potential of permanent injury of individuals who are in close proximity to the source for a longer period of time than Category 2 sources.
- CATEGORY 4 Potential of temporary injury of individuals who may be in close proximity to the source for a longer than Category 3 sources.
- CATEGORY 5 Could, but are unlikely to, cause minor temporary injury of individuals.

Ref: IAEA - TECHDOC-1344

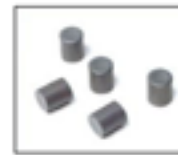
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Radiation Isotope Identifier Device (RIID) RIIDs can identify Uranium-235 (U-235), Uranium-233 (U-233), Uranium-238 (U-238), Plutonium (239), and Neptunium-237 (Np-237).

4. Highly Enriched Uranium (HEU, U-235) Higher concentration of U-235 than natural uranium, with some U-238 remaining. Used in nuclear weapons and some nuclear reactor fuel. IAEA Significant Quantity of U-235: 25 kg (55 lb)*



Uranium Metal



Uranium Reactor Fuel Pellets



Uranium Yellow Cake

5. Uranium-233 (U-233) Could be used to make a nuclear explosive device. IAEA Significant Quantity of U-233: 8 kg (18 lb)*

6. Natural Uranium Mostly Uranium-238 (U-238) with less than 1% U-235. Found in some dirt, rocks, and ceramic tiles. Ore processed into "yellow cake" powder and then into uranium hexafluoride (UF₆), a highly corrosive gas.

7. Depleted Uranium (DU) Primarily U-238 with most U-235 removed. Found in industrial counter-weights, shielding in radiography cameras, some military ammunition, and some tank armor.

8. Plutonium Primarily Plutonium-239 (Pu-239). Emits neutron radiation due to Pu-240 impurity. Used in nuclear weapons and some nuclear reactor fuel. IAEA Significant Quantity of Plutonium: 8 kg (18 lb)*



Plutonium Metal

9. Neptunium-237 (Np-237) Could be used to make a nuclear explosive device.

Isotopes of Concern for use in RDDs and/or REDs with common uses

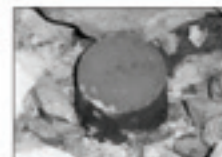
- Cobalt (Co-60)** Cancer treatment, level/density gauge, teletherapy, radiography, food sterilization/irradiation, brachytherapy.
- Iridium (Ir-192)** Radiography non-destructive testing, flaw detection, brachytherapy "cancer seed," skin cancer.



Cobalt 60 sources



Americium-241 Source Capsule



Strontium-90 from Soviet RTG (about size of a coffee can)



Iridium-192 Radiography Cameras with Depleted Uranium Shielding



Cesium-137 Medical Seeds

- Cesium (Cs-137)** Gauge/level gauge, industrial radiography, brachytherapy/teletherapy, well logging/density gauges, instrument calibration sources.
- Strontium (Sr-90)** Radioisotope thermoelectric generator (RTG), fission product, industrial gauges, medical treatment.
- Americium (Am-241)** Check source/calibration source, smoke detector (ionization/type), thickness gauge, moisture/density gauge, x-ray fluorescence, component of used nuclear fuel and plutonium. Part of americium-beryllium (Am:Be) neutron source.



Soil Density Gauge Am:Be and Cs-137

- Radium (Ra-226)** Some medical uses, old luminescent dials, industrial gauges, Naturally Occurring Radioactive Material (NORM), common in ores, rocks and minerals.
- Plutonium (Pu-238)** Radioisotope thermoelectric generator (RTG) for NASA space missions, Soviet-era smoke detectors. Early heart pacemakers.
- Plutonium (Pu-239)** In addition to nuclear weapons, used as part of a plutonium-beryllium (Pu:Be) neutron source.
- Californium (Cf-252)** Neutron source for moisture gauges, well-logging, brachytherapy cancer treatment. Shielded with polyethylene/paraffin shielding, boron/lithium/cadmium.



Radium minerals



Empty Californium-252 Capsules

Common Commodities with elevated levels of radiation

- Aluminum/Aluminum Dross** Aluminum is *not* radioactive. However, many materials that contain aluminum or that are involved in the processing of aluminum *are* radioactive. Aluminum dross is a grey coarse powder byproduct of aluminum production. A shipment of aluminum may contain Potassium (K-40), Thorium (Th-232), and Uranium (U-238).
- Hall Cell Bath (HCB)** Solid, granular to powder in form; it is off-white to gray in color; and odorless. Hall Cell Bath may contain Uranium (U-238), Thorium (Th-232) and Radium (Ra-226).
- Ceramics/Granite/Quartz/Cat Litter/Clay products** Clay and rock based materials typically contain elevated levels of naturally-occurring radioactive materials (NORM) such as Potassium (K-40), Thorium (Th-232) and/or Uranium (U-238).



- Trees, Cranberries, Blueberries, Huckleberries, Cowberries, Bilberries, Bananas, Tobacco, Marijuana** Trees (wood products) and other plants (berries and other food) from Europe may have Cesium (Cs-137) from the Chernobyl accident. Investigate if Cesium discovered in plant products as it may be a hidden illicit Cesium source instead of just plant products. Other plants and plant products may have naturally-occurring Potassium (K-40) [bananas] or Radium (Ra-226) [tobacco, marijuana].
- Potash, Fertilizer** Potash is the common term for potassium-based fertilizer. Contains Potassium (K-40).
- Potassium Chloride Salt (KCl)** Salt substitutes, ice melt, and "salt-free" water softener pellets contain Potassium (K-40).



Potash

Medical Isotopes

Medical Isotopes When undergoing certain medical procedures, radiological isotopes may be injected into the bloodstream or implanted under the skin as pellets. Someone who has received a nuclear medicine treatment in the past few weeks may trigger a radiation alarm.

- Gallium (Ga-67)** Imaging of areas of inflammation.
- Iodine (I-123, I-124, I-125, I-131)** Treatment of cancer, in particular thyroid cancer, and other thyroid diseases.
- Lutetium (Lu-177, Lu-177m)** Treatment of colon cancer, bone cancer, non-Hodgkin's lymphoma, lung cancer, and treatment of prostate, breast, and lung tumors.

- Molybdenum (Mo-99)** Not found in people. Used to generate Tc-99m.
- Phosphorus (P-32)** Inflammation associated with joint pain.
- Palladium (Pd-103)** Treatment of prostate cancer.
- Rubidium (Rb-82)** Cardiac imaging techniques.
- Samarium (Sm-153)** Pain treatment for bone cancer.
- Strontium (Sr-89)** Bone pain relief for patients with prostate cancer.
- Technetium (Tc-99m)** Most common medical isotope. Cardiac "heart" stress tests. Tracer to detect where a tumor is located.
- Thallium (Tl-201)** Imaging for heart related conditions.
- Xenon (Xe-133)** Imaging of heart, lungs, brain and blood flow.

Radioactive Material Shipment Placarding and Labeling



Vehicle Placards on the outside of the vehicle (all 4 sides) are required when transporting radioactive material packages with Yellow-III labels.

Package Types

Type A Package Designed to survive normal transport conditions. Does *not* contain life-threatening amounts of radioactive material.



Type B Package Designed to survive severe accidents. Life threatening conditions may exist only if contents are released or package shielding fails. May be as small as a lunch box (radiography camera) or as large as a trailer.



Radioactive Package Labels (Max Radiation Levels)

- Radioactive White-I**
Up to 0.5 mrem/h (500 µrem/h) at the package surface.
- Radioactive Yellow-II**
0.5 mrem/h up to 50 mrem/h at the package surface.
Up to 1 mrem/h (1,000 µrem/h) at 1 meter (40 inches).
- Radioactive Yellow-III**
50 mrem/h up to 200 mrem/h at the package surface.
Up to 10 mrem/h at 1 meter (40 inches).



Millirem per hour (mrem/h) Radiation level measured with instrument. Normal background radiation levels are usually less than 0.010 mrem/h (or 10 µrem/h, microrem per hour).

Los Alamos National Laboratory Chemistry Division

Periodic Table of the Elements

1A	1 H hydrogen 1.008	2A	4 Be beryllium 9.012	3A	5 B boron 10.81	4A	6 C carbon 12.01	5A	7 N nitrogen 14.01	6A	8 O oxygen 16.00	7A	9 F fluorine 19.00	8A	2 He helium 4.003
	3 Li lithium 6.94		12 Mg magnesium 24.31		13 Al aluminum 26.98		14 Si silicon 28.09		15 P phosphorus 30.97		16 S sulfur 32.06		17 Cl chlorine 35.45		10 Ne neon 20.18
	11 Na sodium 22.99				31 Ga gallium 69.72		32 Ge germanium 72.64		33 As arsenic 74.92		34 Se selenium 78.96		35 Br bromine 79.90		18 Ar argon 39.95
	19 K potassium 39.10		20 Ca calcium 40.08		39 Y yttrium 88.91		49 In indium 114.8		51 Sb antimony 121.8		52 Te tellurium 127.6		53 I iodine 126.9		36 Kr krypton 83.79
	37 Rb rubidium 85.47		38 Sr strontium 87.62				81 Tl thallium 204.4		83 Bi bismuth 209.0		84 Po polonium (209)		85 At astatine (210)		54 Xe xenon 131.3
	55 Cs cesium 132.9		56 Ba barium 137.3				80 Hg mercury 200.5		82 Pb lead 207.2		86 Rn radon (222)		87 Ts tennessine (294)		55 La lanthanum 138.9
	87 Fr francium (223)		88 Ra radium (226)				79 Au gold 197.0		81 Pb lead 207.2		88 Rn radon (222)		89 Ts tennessine (294)		56 Ce cerium 140.1
							78 Pt platinum 195.1		82 Pb lead 207.2		86 Rn radon (222)		91 Pa protactinium 231		57 La lanthanum 138.9
							77 Ir iridium 192.2		84 Po polonium (209)		88 Rn radon (222)		92 U uranium 238		58 Ce cerium 140.1
							76 Os osmium 190.2		86 Rn radon (222)		92 U uranium 238		93 Np neptunium (237)		59 Pr praseodymium 140.9
							75 Re rhenium 186.2		88 Rn radon (222)		94 Pu plutonium (244)		94 Pu plutonium (244)		60 Nd neodymium 144.2
							74 W tungsten 183.9		90 Rf rutherfordium (261)		96 Cm curium (247)		96 Cm curium (247)		61 Pm promethium (145)
							73 Ta tantalum 180.9		92 U uranium 238		98 Cf californium (251)		98 Cf californium (251)		62 Sm samarium 150.4
							72 Hf hafnium 178.5		94 Pu plutonium (244)		100 Fm fermium (257)		100 Fm fermium (257)		63 Eu europium 152.0
							71 Sc scandium 44.96		96 Cm curium (247)		102 No nobelium (259)		102 No nobelium (259)		64 Gd gadolinium 157.2
							21 Sc scandium 44.96		98 Cf californium (251)		104 Lr lawrencium (262)		104 Lr lawrencium (262)		65 Tb terbium 158.9
							20 Ca calcium 40.08		100 Fm fermium (257)		106 Lv livermorium (293)		106 Lv livermorium (293)		66 Dy dysprosium 162.5
							19 K potassium 39.10		102 No nobelium (259)		108 Og oganesson (294)		108 Og oganesson (294)		67 Ho holmium 164.9
							18 Ar argon 39.95		104 Lr lawrencium (262)		110 Ds darmstadtium (281)		110 Ds darmstadtium (281)		68 Er erbium 167.3
							17 Cl chlorine 35.45		106 Lv livermorium (293)		112 Cn copernicium (285)		112 Cn copernicium (285)		69 Tm thulium 168.9
							16 S sulfur 32.06		108 Og oganesson (294)		114 Fl flerovium (289)		114 Fl flerovium (289)		70 Yb ytterbium 173.0
							15 P phosphorus 30.97		110 Ds darmstadtium (281)		116 Lv livermorium (293)		116 Lv livermorium (293)		71 Lu lutetium 175.0
							14 Si silicon 28.09		112 Cn copernicium (285)		118 Og oganesson (294)		118 Og oganesson (294)		72 Hf hafnium 178.5
							13 Al aluminum 26.98		114 Fl flerovium (289)		118 Og oganesson (294)		118 Og oganesson (294)		73 Ta tantalum 180.9
							12 Mg magnesium 24.31		116 Lv livermorium (293)		118 Og oganesson (294)		118 Og oganesson (294)		74 W tungsten 183.9
							11 Na sodium 22.99		118 Og oganesson (294)		118 Og oganesson (294)		118 Og oganesson (294)		75 Re rhenium 186.2
							10 Ne neon 20.18		118 Og oganesson (294)		118 Og oganesson (294)		118 Og oganesson (294)		76 Os osmium 190.2
							9 F fluorine 19.00		118 Og oganesson (294)		118 Og oganesson (294)		118 Og oganesson (294)		77 Ir iridium 192.2
							8 O oxygen 16.00		118 Og oganesson (294)		118 Og oganesson (294)		118 Og oganesson (294)		78 Pt platinum 195.1
							7 N nitrogen 14.01		118 Og oganesson (294)		118 Og oganesson (294)		118 Og oganesson (294)		79 Au gold 197.0
							6 C carbon 12.01		118 Og oganesson (294)		118 Og oganesson (294)		118 Og oganesson (294)		80 Hg mercury 200.5
							5 B boron 10.81		118 Og oganesson (294)		118 Og oganesson (294)		118 Og oganesson (294)		81 Tl thallium 204.4
							4 Be beryllium 9.012		118 Og oganesson (294)		118 Og oganesson (294)		118 Og oganesson (294)		82 Pb lead 207.2
							3 Li lithium 6.94		118 Og oganesson (294)		118 Og oganesson (294)		118 Og oganesson (294)		83 Bi bismuth 209.0
							2 He helium 4.003		118 Og oganesson (294)		118 Og oganesson (294)		118 Og oganesson (294)		84 Po polonium (209)
							1 H hydrogen 1.008		118 Og oganesson (294)		118 Og oganesson (294)		118 Og oganesson (294)		85 At astatine (210)

57 La lanthanum 138.9	58 Ce cerium 140.1	59 Pr praseodymium 140.9	60 Nd neodymium 144.2	61 Pm promethium (145)	62 Sm samarium 150.4	63 Eu europium 152.0	64 Gd gadolinium 157.2	65 Tb terbium 158.9	66 Dy dysprosium 162.5	67 Ho holmium 164.9	68 Er erbium 167.3	69 Tm thulium 168.9	70 Yb ytterbium 173.0	71 Lu lutetium 175.0
89 Ac actinium 227	90 Th thorium 232	91 Pa protactinium 231	92 U uranium 238	93 Np neptunium (237)	94 Pu plutonium (244)	95 Am americium (243)	96 Cm curium (247)	97 Bk berkelium (247)	98 Cf californium (251)	99 Es einsteinium (252)	100 Fm fermium (257)	101 Md mendelevium (258)	102 No nobelium (259)	103 Lr lawrencium (262)

Lanthanide Series*

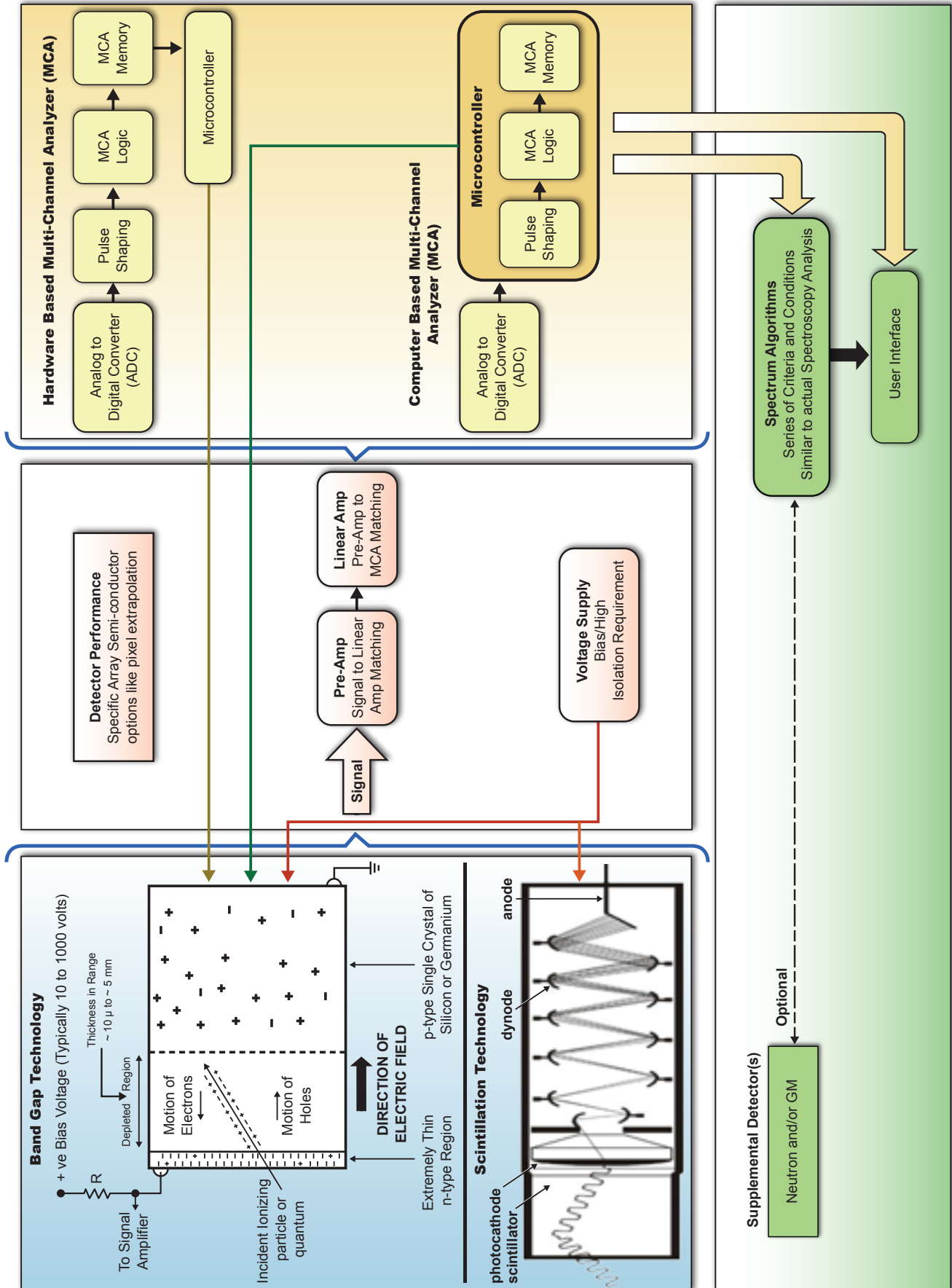
Actinide Series**

element names in **blue** are liquids at room temperature
 element names in **red** are gases at room temperature
 element names in **black** are solids at room temperature

3/13/17



How do we identify isotopes? Radioisotope Identification Device (RIID) schematic showing typical scintillation and semi-conductor (Band Gap) types of technology.





AN/PDR-77 Radiac Set

FACT SHEET 26-007-1214

Note: the following fact sheet provides guidance on selecting the most appropriate probe to use with the AN/PDR-77 Radiac given various scenarios. This fact sheet will not train you on the proper use of the AN/PDR-77.

AN/PDR-77 Radiac Set: Choosing the Proper Probe

The AN/PDR-77 Radiac Set is a multipurpose radiation detection system. Its versatile, rugged design makes it ideal for nuclear accident and incident response. The meter, alpha probe, beta/gamma probe, and x-ray probe are the four major components of the AN/PDR-77. However, the capabilities of the PDR-77 may be augmented by the Radiation Protection Officer (RPO) Kit, which contains the micro-R probe and the pancake probe.

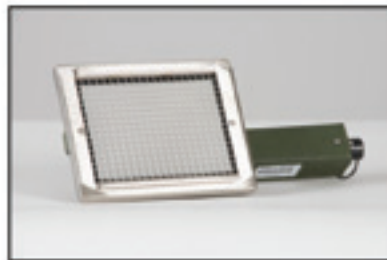


AN/PDR-77 Radiac with Beta/Gamma (β/γ) Probe (DT-616)

AN/PDR-77 Standard Probes



X-ray Probe (DT-674)



Alpha (α) Probe (DT-669)



Beta/Gamma (β/γ) Probe (DT-616)

AN/PDR-77 RPO Kit



Pancake Probe (DT-695)



micro-R Probe (DT-696)

U.S. Army Public Health Command
Health Physics Program
5158 Blackhawk Road, Aberdeen Proving Ground, Maryland 21010-5403
410-436-3502 or DSN 584-3502
Approved for Public Release; Distribution Unlimited

Probe Selection Table

		<u>Probe Type</u>					
		β/γ Probe	α Probe	X-ray Probe	Pancake Probe	micro-R Probe	
		Alpha Emitters					
Measuring Objective	Detection or Measurement¹	C (Open Window)	A	B ⁴	A	C	
	Locate Missing Source²	C (Open Window)	C	A	A	C	
			Beta Emitters				
	All Types	B (Open Window)	U	B ⁴	A	C	
			Gamma Emitters				
	Detection or Measurement	A	U	A	A	A	
	Locate Missing Source	A	U	A	A	A	
	Basic External Radiation Dose Measurement Survey³	A	U	U	U	B ⁴	
			Unknown sources				
	Detection or Measurement	B	U	B ⁴	A	B ⁴	
A = First Choice; B = Second Choice; C = Use if No Other Probes Are Available; U = Unacceptable							
1. Determine the presence or intensity of radiation.							
2. Find a radioactive source.							
3. Determine ambient radiation doses and dose rates in a given area.							
4. Most alpha and beta emitters have associated gamma rays and/or x rays. Therefore, these probes can be used to detect the presence of many alpha and beta emitters. If there are no associated gamma rays or x rays emitted, then these probes will not detect the radioactive material.							

Probe Considerations and Limitations

- The AN/PDR-77 does not have the ability to detect neutrons.
- The alpha probe responds to alpha particles above 3 MeV.
- On the X-ray probe, the 17 keV channel has lower and upper discriminators of 12.5 keV and 21.5 keV, respectively, the 60 keV channel has settings of 50 keV and 70 keV, and the "PEAK ALIGN" channel has settings of 70 keV and 95 keV.
- Despite the display, the beta/gamma probe is calibrated in mrad/hr.
- The beta/gamma probe is compensated to provide a tissue dose response; the response begins to fall off at energies below 100 keV.
- The difference in dose rate between the beta/gamma probe's two positions (window open and window closed) does not yield the beta dose rate.
- The pancake probe entrance window effectively blocks beta particles with energies less than about 35 keV and alpha particles with energies less than 4 MeV.
- The response of the micro-R probe is highly dependent on photon energy. See response curve in the technical manual for more information.
- The micro-R probe is useful as a radiation detector, but not as a dose meter.



New Equipment - FY21 Fielding of Joint Detector Systems



Under the Joint Program Manager CBRN Sensors, the Joint Product Leader Radiological and Nuclear Defense (JPdL RND) was established in 2013 partly out of the lessons learned from Operation TOMODACHI with an overarching goal to develop, test and field the Department of Defense's first joint, interagency and international radiological detector known as the Radiological Detection System which begins fielding in FY 21. Collaborating with the Department of the Navy, fielding has also already begun with the IM 276 PD and IM 278 U Joint Personal Dosimeters. Additionally, in FY 21 fielding also begins with the Man Portable Radiological Detection System or MRDS.

Radiological & Nuclear Protection - Radiological Detection System (RDS)

Description: The Radiological Detection System (RDS) will replace DoD's legacy Radiation Detection and Computation (RADIAC) survey meters as well as USCG, UK, and Canadian legacy systems. The RDS will provide the Warfighter with the capability to detect alpha, beta, gamma, neutron, and low energy x-rays.



Legacy System Replacement: Replaces following systems reaching obsolescence: USA & USMC AN/PDR 77, USA AN/VDR 2, USAF ADM 300, USN & USCG Multi functional RADIAC (MFR) Suite

Capabilities: RDS possesses modern capability upgrades over legacy RADIAC systems including open architecture smart probes, Net Ready, GPS interface, and data logging. Provides a common, interoperable equipment with adequate sensitivity and common units of measure.



Radiological & Nuclear Protection - Joint Personal Dosimeter Individual (JPD IND)



Description: Fielded as the IM-276PD (Navy) and the IM 278/U (Army), the dosimeter will provide a sensor to record and retrieve a Service member's radiation exposure from occupational to tactical levels.

Legacy System Replacement: The Joint Personal Dosimeter Individual (JPD IND) is intended to replace DoD's legacy dosimeter (the Navy's IM 270 and the Army's PDR 75 Series Systems).

Capabilities:

- No separate reader needed to obtain dose information
- Data Transfer from dosimeter to computer
- National Voluntary Laboratory Accreditation Program (NVLAP) Accreditable to obtain Dose of Record for Warfighter's Medical Records



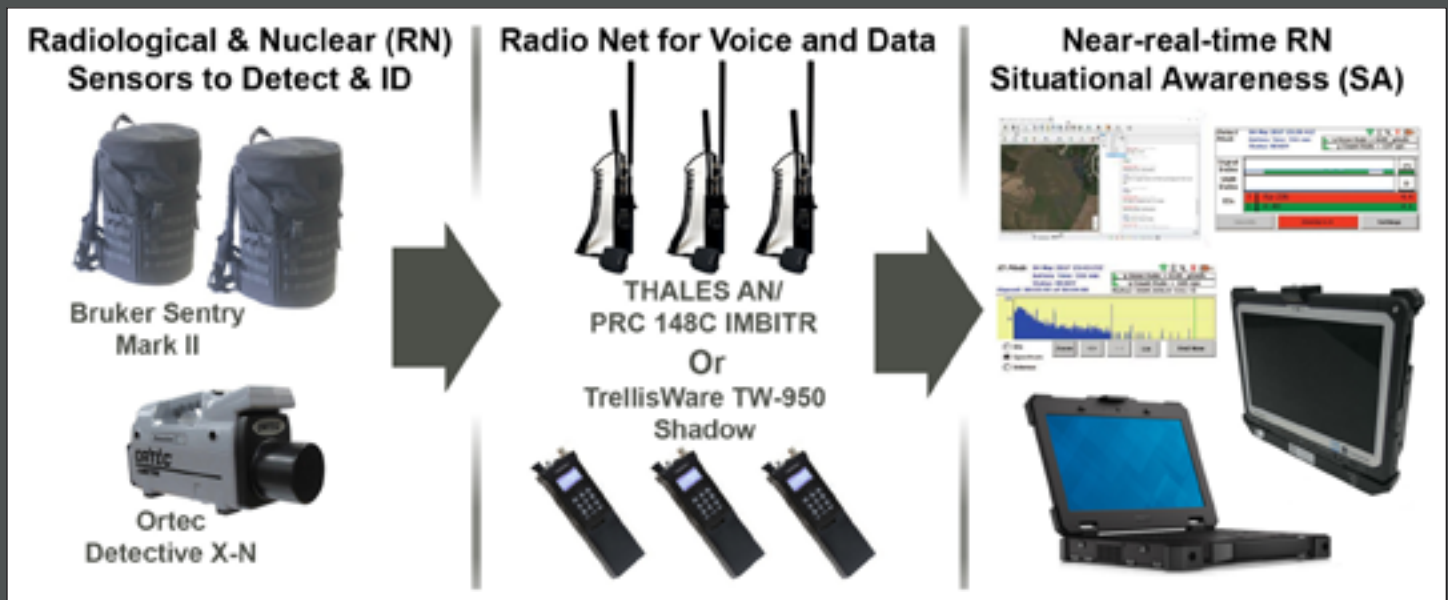
IM-276PD (Navy)



IM 278/U (Army)

Radiological & Nuclear Prevention - Man Portable Radiological Detection System (MRDS)

Description: The MRDS provides increased Radiological Nuclear (RN) detection, localization, and presumptive and field confirmatory identification of Special Nuclear Material (SNM) capabilities that are networked to provide a near real time situational awareness at the tactical level. MRDS supports Countering Weapons of Mass Destruction Interdiction and Elimination operations, specifically RN Sensitive Site Assessment (SSA) and Sensitive Site Exploitation (SSE).



Legacy System Replacement:

- TSTIRS JCTD equipment Nuclear Disablement Team
- Various COTS Civil Support Team
- Adds New Capabilities to more Army CBRN Teams

Capabilities: Hands Free (HF) and Hand Held (HH) RN sensors. Situational awareness (SA) suite displays sensor data from all sensors at the tactical level. MRDS allows for SNM searching in radio frequency restricted facility.

DEFENSE NUCLEAR WEAPONS SCHOOL

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