MEMORANDUM

To: Technical Committee on Hazardous Materials Response Personnel
From: Jenny Depew, Project Administrator
Date: January 11, 2017
Subject: NFPA 472 Second Draft TC FINAL Ballot Results (A2017) REVISED

According to the final ballot results, all ballot items received the necessary affirmative votes to pass ballot.

32 Members Eligible to Vote
0 Not Returned

According to the final ballot results, the Supplemental Ballot on Second Revision No. 9 received the necessary affirmative votes to pass ballot.

32 Members Eligible to Vote
10 Not Returned (Baxter, Carr, Carrasco, Clawson, Collins, D'Onofrio, Emery, Ingram, McNett, Minson)

The attached report shows the number of affirmative, negative, and abstaining votes as well as the explanation of the vote for each revision.

To pass ballot, each revision requires: (1) a simple majority of those eligible to vote and (2) an affirmative vote of 2/3 of ballots returned. See Sections 3.3.4.3.(c) and 4.4.10.1 of the Regulations Governing the Development of NFPA Standards.
In Chapter 19 only:
Remove "air" in front of all "monitoring".

Submitter Information Verification

Submitter Full Name: Thomas McGowan
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Street Address:
City:
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Submittal Date: Tue Sep 27 22:21:10 EDT 2016

Committee Statement

Committee Statement: consistency between documents.
Response Message:
Public Comment No. 17-NFPA 472-2016 [Chapter 19]

Ballot Results

✓ This item has passed ballot

32 Eligible Voters
0 Not Returned
31 Affirmative All
   1 Affirmative with Comments
0 Negative with Comments
0 Abstention

Affirmative All
Baxter, Christina M.
Bevelacqua, Armando S.
Carr, H. K.
Carrasco, Jorge A.
Clawson, Tom
Coffey, William R.
Collins, K. Wade
D'Onofrio, Cris
Edinger, Richard C.
Emery, Richard B.
Haberkorn, Clay
Hergenreter, Steven
Ingram, Robert J.
Kreutzer, Kristina
Lilley, Troy
McNett, Wayne
Miller, Ryan K.
Miller, Leslie A.
Miller, Thomas D.
Minson, Matthew
Noll, Gregory G.
Porter, John F.
Preston, Lawrence L.
Rehak, Timothy R.
Royall, Jr., Robert W.
Schnepp, Rob
Simpson, Danny G.
Terryn, Fred C.
Tracy, Christopher
Uzeloc, Kenneth W.
Wright, Charles J.

Affirmative with Comment

Makins, Jr., Carl
agree with committee statement
Second Revision No. 23-NFPA 472-2016 [ Global Comment ]

The TC is looking to have a "word search" for "intermodal containers". Please replace "intermodal container(s)" with "intermodal tank(s)" throughout the document.

Submitter Information Verification

Submitter Full Name: Thomas McGowan
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Street Address:
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Submittal Date: Fri Oct 21 04:39:24 EDT 2016

Committee Statement

Committee Statement: consistency with terminology and with document.

Response Message:

Ballot Results

✓ This item has passed ballot

32 Eligible Voters
0 Not Returned
31 Affirmative All
1 Affirmative with Comments
0 Negative with Comments
0 Abstention

Affirmative All
Baxter, Christina M.
Bevelacqua, Armando S.
Carr, H. K.
Carrasco, Jorge A.
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Preston, Lawrence L.
Rehak, Timothy R.
Royall, Jr., Robert W.
Schnepp, Rob
Simpson, Danny G.
Terryn, Fred C.
Tracy, Christopher
Uzeloc, Kenneth W.
Wright, Charles J.

**Affirmative with Comment**
Makins, Jr., Carl

agree with committee statement
2.4 References for Extracts in Mandatory Sections.


Submitter Information Verification

Submitter Full Name: Thomas McGowan
Organization: National Fire Protection Assoc
Street Address:
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Submittal Date: Fri Nov 04 15:52:54 EDT 2016

Committee Statement

Committee Statement: no extract reference to NFPA 1072.
Response Message:

Ballot Results

✓ This item has passed ballot

32 Eligible Voters
0 Not Returned
31 Affirmative All
1 Affirmative with Comments
0 Negative with Comments
0 Abstention

Affirmative All
Baxter, Christina M.
Bevelacqua, Armando S.
Carr, H. K.
Carrasco, Jorge A.
Clawson, Tom
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Rehak, Timothy R.
Royall, Jr., Robert W.
Schnepp, Rob
Simpson, Danny G.
Terryn, Fred C.
Tracy, Christopher
Uzeloc, Kenneth W.
Wright, Charles J.

**Affirmative with Comment**

Makins, Jr., Carl
agree with committee statement
3.3 General Definitions.

3.3.1 Action Options.
Tasks responders perform to meet response objectives at hazardous materials/weapons of mass destruction (WMD) incidents.

3.3.2* Allied Professional.
That person who possesses the knowledge, skills, and technical competence to provide assistance in the selection, implementation, and evaluation of tasks at a hazardous materials/weapons of mass destruction (WMD) incident.

3.3.3 Analyze.
The process of identifying a hazardous materials/weapons of mass destruction (WMD) problem and determining likely behavior and harm within the training and capabilities of the emergency responder.

3.3.4 Area of Specialization.

3.3.4.1 Individual Area of Specialization.
The qualifications or functions of a specific job(s) associated with chemicals and/or containers used within an organization.

3.3.4.2 Organization's Area of Specialization.
Any chemicals or containers used by the specialist employee's employer.

3.3.5 Awareness Level Personnel.
Personnel who, in the course of their normal duties, could encounter an emergency involving hazardous materials/weapons of mass destruction (WMD) and who are expected to recognize the presence of the hazardous materials WMD, protect themselves, call for trained personnel, and secure the scene. (See Annex E.)

3.3.6 CANUTEC.
The Canadian Transport Emergency Centre, operated by Transport Canada, that provides emergency response information and assistance on a 24-hour basis for responders to hazardous materials/weapons of mass destruction (WMD) incidents.

3.3.7 CHEMTREC.
A public service of the American Chemistry Council, which provides emergency response information and assistance on a 24-hour basis for responders to hazardous materials/weapons of mass destruction (WMD) incidents.

3.3.8 Competence.
Possessing knowledge, skills, and judgment needed to perform indicated objectives.

3.3.9* Confined Space.
An area large enough and so configured that a member can bodily enter and perform assigned work but which has limited or restricted means for entry and exit and is not designed for continuous human occupancy.

3.3.10 Container.
A receptacle, piping, or pipeline used for storing or transporting material of any kind; synonymous with "packaging" in transportation.
3.3.10.1 Bulk Transportation Containers.
Containers, including transport vehicles, having a liquid capacity of more than 119 gal (450 L), a solids capacity of more than 882 lb (400 kg), or a compressed gas water capacity of more than 1001 lb (454 kg) that are either placed on or in a transport vehicle, or vessel or are constructed as an integral part of the transport vehicle, including:

a. Cargo tanks including nonpressure tanks — MC-306/DOT-406 or equivalent, low-pressure tanks — MC-307-DOT-407 or equivalent, corrosive liquid tanks — MC-312/DOT-412 or equivalent, high-pressure tanks — MC-331 or equivalent, and cryogenic tanks — MC-338 or equivalent.
b. Portable tanks such as intermodal tanks, including nonpressure tanks, pressure tanks, cryogenic tanks, and tube modules.
c. Tank cars including nonpressure tank cars, pressure tanks cars, and cryogenic tank cars.
d. Ton containers.

3.3.10.2 Facility Storage Tanks.
Atmospheric and low-pressure storage tanks, pressurized storage tanks, and cryogenic storage tanks.

3.3.10.3 Intermediate Bulk Containers (IBCs).
Pressure, nonpressure, and cryogenic rigid or flexible portable containers, other than cylinders or portable tanks, designed for mechanical lifting.

3.3.10.4 Nonbulk Containers.
Containers, including bags, boxes, carboys, cylinders, drums, and Dewar flasks for cryogenic liquids, having a liquid capacity of 119 gal (450 L) or less, a solids capacity of 882 lb (400 kg) or less, or a compressed gas water capacity of 1001 lb (454 kg) or less.

3.3.10.5 Pipeline.
A length of pipe including pumps, valves, flanges, control devices, strainers, and/or similar equipment for conveying fluids. [70, 2017]

3.3.10.6 Piping.
Assemblies of piping components used to convey, distribute, mix, separate, discharge, meter, control, or snub fluid flows. Piping also includes pipe-supporting elements but does not include support structures such as building frames, bents, foundations, or any other equipment excluded from this standard. [51, 2013]

3.3.10.7* Radioactive Materials Containers.
Excepted packaging, industrial packaging, Type A, Type B, and Type C packaging for radioactive materials.

3.3.11 Contaminant.
A hazardous material, or the hazardous component of a weapon of mass destruction (WMD), that physically remains on or in people, animals, the environment, or equipment, thereby creating a continuing risk of direct injury or a risk of exposure.

3.3.12 Contamination.
The process of transferring a hazardous material, or the hazardous component of a weapon of mass destruction (WMD), from its source to people, animals, the environment, or equipment, that can act as a carrier.

3.3.12.1 Cross Contamination.
The process by which a contaminant is carried out of the hot zone and contaminates people, animals, the environment, or equipment.

3.3.13 Control.
The procedures, techniques, and methods, used in the mitigation of hazardous materials/weapons of mass destruction (WMD) incidents, including containment, extinguishment, and confinement.

3.3.13.1 Confinement.
Those procedures taken to keep a material, once released, in a defined or local area.

3.3.13.2 Containment.
The actions taken to keep a material in its container (e.g., stop a release of the material or reduce the amount being released).
3.3.13 Extinguishment.
To cause to cease burning.

3.3.14 Control Zones.
The areas at hazardous materials/weapons of mass destruction (WMD) incidents within an established/controlled perimeter that are designated based upon safety and the degree of hazard.

3.3.14.1 Cold Zone.
The control zone of hazardous materials/weapons of mass destruction (WMD) incidents that contains the incident command post and such other support functions as are deemed necessary to control the incident.

3.3.14.2 Decontamination Corridor.
The area usually located within the warm zone where decontamination is performed.

3.3.14.3 Hot Zone.
The control zone immediately surrounding hazardous materials/weapons of mass destruction (WMD) incidents, which extends far enough to prevent adverse effects of hazards to personnel outside the zone and where only personnel who are trained, equipped, and authorized to do the assigned work are permitted to enter.

3.3.14.4 Warm Zone.
The control zone at hazardous materials/weapons of mass destruction (WMD) incidents where personnel and equipment decontamination and hot zone support takes place.

3.3.15 Coordination.
The process used to get people, who could represent different agencies, to work together integrally and harmoniously in a common action or effort.

3.3.16 Decontamination.
The physical and/or chemical process of reducing and preventing the spread and effects of contaminants to people, animals, the environment, or equipment involved at hazardous materials/weapons of mass destruction (WMD) incidents.

3.3.16.1 Emergency Decontamination.
The process of immediately reducing contamination of individuals in potentially life-threatening situations with or without the formal establishment of a decontamination corridor.

3.3.16.2 Gross Decontamination.
A phase of the decontamination process where significant reduction of the amount of surface contamination takes place as soon as possible, most often accomplished by mechanical removal of the contaminant or initial rinsing from handheld hose lines, emergency showers, or other nearby sources of water.

3.3.16.3 Mass Decontamination.
The process of reducing or removing surface contaminants from large numbers of victims in potentially life-threatening situations in the fastest time possible.

3.3.16.4 Technical Decontamination.
The planned and systematic process of reducing contamination to a level that is as low as reasonably achievable.

3.3.17 Degradation.
A chemical action involving the molecular breakdown of a protective clothing material or equipment due to contact with a chemical.

3.3.18 Demonstrate.
To show by actual performance.

3.3.19 Describe.
To explain verbally or in writing using standard terms recognized by the hazardous materials/weapons of mass destruction (WMD) response community.
3.3.20 Detection and Monitoring Equipment.
Instruments and devices used to detect, classify, or quantify materials.

3.3.21 Dispersal Device.
Any weapon or combination of mechanical, electrical, or pressurized components that is designed,
tended, or used to cause death or serious bodily injury through the release, dissemination, or impact of
toxic or poisonous chemicals or their precursors, biological agent, toxin or vector, or radioactive material.

3.3.22 Emergency Response Guidebook (ERG).
The reference book, written in plain language, to guide emergency responders in their actions at the
incident scene, specifically the Emergency Response Guidebook from the U.S. Department of
Transportation; Transport Canada; and the Secretariat of Transportation and Communications, Mexico.

3.3.23 Endangered Area.
The actual or potential area of exposure associated with the release of a hazardous material/weapon of
mass destruction (WMD).

3.3.24 Evaluate.
The process of assessing or judging the effectiveness of a response operation or course of action within
the training and capabilities of the emergency responder.

3.3.25 Evidence Preservation.
Deliberate and specific actions taken with the intention of protecting potential evidence from
contamination, damage, loss, or destruction.

3.3.26 Example.
An illustration of a problem serving to show the application of a rule, principle, or method (e.g., past
incidents, simulated incidents, parameters, pictures, and diagrams).

3.3.27* Exposure.
The process by which people, animals, the environment, property, and equipment are subjected to or
come in contact with a hazardous material/weapon of mass destruction (WMD).

3.3.28 Exposures.
The people, animals, environment, property, and equipment that might become exposed at a hazardous
materials/weapons of mass destruction (WMD) incident. [1072, 2017]

3.3.29* Fissile Material.
Material whose atoms are capable of nuclear fission (capable of being split).

3.3.30 Harm.
Adverse effect created by being exposed to a hazard. [1072, 2017]

3.3.31 Hazard.
Capable of causing harm or posing an unreasonable risk to life, health, property, or the environment.
[1072, 2017]

3.3.32* Hazardous Material.
Matter (solid, liquid, or gas) or energy that when released is capable of creating harm to people, the
environment, and property, including weapons of mass destruction (WMD) as defined in 18 U.S. Code,
Section 2332a, as well as any other criminal use of hazardous materials, such as illicit labs, environmental
Crimes, or industrial sabotage.

3.3.33* Hazardous Materials Branch/Group.
The function within an overall incident management system (IMS) that deals with the mitigation and
control of the hazardous materials/weapons of mass destruction (WMD) portion of an incident.

3.3.34* Hazardous Materials Officer.
The person who is responsible for directing and coordinating all operations involving hazardous
materials/weapons of mass destruction (WMD) as assigned by the incident commander (IC).
3.3.35* Hazardous Materials Response Team (HMRT).
An organized group of trained response personnel operating under an emergency response plan and applicable standard operating procedures who perform hazardous material technician level skills at hazardous materials/weapons of mass destruction (WMD) incidents.

3.3.36* Hazardous Materials Safety Officer.
The person who works within an incident management system (IMS) (specifically, the hazardous materials branch/group) to ensure that recognized hazardous materials/weapons of mass destruction (WMD) safe practices are followed at hazardous materials/WMD incidents.

3.3.37 Identify.
To select or indicate verbally or in writing using standard terms to establish the fact of an item being the same as the one described.

3.3.38 Incident.
An emergency involving the release or potential release of hazardous materials/weapons of mass destruction (WMD).

3.3.39 Incident Analysis.
The process of analyzing the risk at an incident by identifying the materials and containers involved, predicting the likely behavior of each container and its contents, and estimating the potential harm/outcomes associated with that behavior.

3.3.40* Incident Commander (IC).
The individual responsible for all incident activities, including the development of strategies and tactics and the ordering and the release of resources.

3.3.41 Incident Command System (ICS).
A component of an incident management system (IMS) designed to enable effective and efficient on-scene incident management by integrating organizational functions, tactical operations, incident planning, incident logistics, and administrative tasks within a common organizational structure.

3.3.42* Incident Management System (IMS).
A process that defines the roles and responsibilities to be assumed by personnel and the operating procedures to be used in the management and direction of emergency operations to include the incident command system (ICS), unified command, multiagency coordination system, training, and management of resources.

3.3.43 Match.
To provide with a counterpart.

3.3.44 Objective.
A goal that is achieved through the attainment of a skill, knowledge, or both, that can be observed or measured.

3.3.45 Penetration.
The movement of a material through a suit’s closures, such as zippers, buttonholes, seams, flaps, or other design features of chemical-protective clothing, and through punctures, cuts, and tears.

3.3.46 Permeation.
A chemical action involving the movement of chemicals, on a molecular level, through intact material.

3.3.47* Personal Protective Equipment (PPE).
The protective clothing and respiratory protective equipment provided to shield or isolate a person from the hazards encountered at hazardous materials/weapons of mass destruction (WMD) incident operations.

3.3.48 Plan.
3.3.48.1* Emergency Response Plan (ERP).
A plan — developed by the authority having jurisdiction (AHJ) with the cooperation of all participating agencies and organizations, including a jurisdiction with emergency responsibilities and those outside the jurisdiction who have entered into response/support agreements — that identifies goals and objectives for that emergency type, agency roles, and overall strategies.

3.3.48.2* Incident Action Plan (IAP).
An oral or written plan approved by the incident commander containing general objectives reflecting the overall strategy for managing an incident for a specific time frame and target location.

3.3.48.3* Site Safety and Control Plan.
A site-specific safety document used within the incident command system (ICS) to organize information important to hazardous materials response operations.

3.3.49* Planned Response.
The incident action plan, with the site safety and control plan, consistent with the emergency response plan and/or standard operating procedures for a specific hazardous materials/weapon of mass destruction (WMD) incident.

3.3.50* Predict.
The process of estimating or forecasting the future behavior of a hazardous materials/weapons of mass destruction (WMD) container and/or its contents within the training and capabilities of the emergency responder.

3.3.51* Protective Clothing.
Equipment designed to protect the wearer from thermal hazards, hazardous materials, or from the hazardous component of a weapon of mass destruction contacting the skin or eyes.

3.3.51.1 Ballistic Protective Clothing (BPC).
An item of personal protective equipment that provides protection against specific ballistic threats by helping to absorb the impact and reduce or prohibit the penetration to the body from bullets and steel fragments from handheld weapons and exploding munitions.

3.3.51.2* Chemical-Protective Clothing (CPC).
The ensemble elements (garment, gloves, and footwear) provided to shield or isolate a person from the hazards encountered during hazardous materials/WMD incident operations.

3.3.51.2.1* Liquid Splash–Protective Clothing.
Multiple elements of compliant protective clothing and equipment products that when worn together provide protection from some, but not all, risks of hazardous materials/WMD emergency incident operations involving liquids.

3.3.51.2.2* Vapor–Protective Clothing.
Multiple elements of compliant protective clothing and equipment that when worn together provide protection from some, but not all, risks of vapor, liquid-splash, and particulate environments during hazardous materials/WMD incident operations.

3.3.51.3* High Temperature–Protective Clothing.
Protective clothing designed to protect the wearer for short-term high temperature exposures.

3.3.51.4* Structural Fire-Fighting Protective Clothing.
The fire-resistant protective clothing normally worn by fire fighters during structural fire-fighting operations, which includes a helmet, coat, pants, boots, gloves, PASS device, and a fire-resistant hood to cover parts of the head and neck not protected by the helmet and respirator facepiece.

3.3.52 Public Safety Sampling.
The detection, monitoring, or collection of a material for the purposes of determining the hazards present and to guide public safety response decisions.

3.3.53* Qualified.
Having knowledge of the installation, construction, or operation of apparatus and the hazards involved.
3.3.54* Respiratory Protection.
Equipment designed to protect the wearer from the inhalation of contaminants.

3.3.55* Response.
That portion of incident management in which personnel are involved in controlling hazardous materials/weapons of mass destruction (WMD) incidents.

3.3.56 Risk.
The probability or threat of suffering harm or loss.

3.3.57 Risk-Based Response Process.
Systematic process by which responders analyze a problem involving hazardous materials/weapons of mass destruction (WMD), assess the hazards, evaluate the potential consequences, and determine appropriate response actions based upon facts, science, and the circumstances of the incident.

3.3.58* Safety Data Sheet (SDS).
Formatted information provided by chemical manufacturers and distributors of hazardous products, that contains information about chemical composition, physical and chemical properties, health and safety hazards, emergency response, and waste disposal of the material.

3.3.59* Sampling.
The process of selecting materials to analyze.

3.3.60 Scenario.
A sequence or synopsis of actual or imagined events used in the field or classroom to provide information necessary to meet student competencies; can be based upon threat assessment.

3.3.61 SETIQ.
The Emergency Transportation System for the Chemical Industry in Mexico that provides emergency response information and assistance on a 24-hour basis for responders to emergencies involving hazardous materials/weapons of mass destruction (WMD).

3.3.62 Specialist Employees.

3.3.62.1* Specialist Employee A.
That person who is specifically trained to handle incidents involving chemicals or containers for chemicals used in the organization’s area of specialization.

3.3.62.2* Specialist Employee B.
That person who, in the course of his or her regular job duties, works with or is trained in the hazards of specific chemicals or containers within the individual’s area of specialization.

3.3.62.3* Specialist Employee C.
That person who responds to emergencies involving chemicals and/or containers within the organization’s area of specialization.

3.3.63 Stabilization.
The point in an incident when the adverse behavior of the hazardous material, or the hazardous component of a weapon of mass destruction (WMD), is controlled.

3.3.64 Standard Operating Procedure (SOP).
A written directive that establishes specific operational or administrative methods to be followed routinely for the performance of a task or for the use of equipment.

3.3.65 Surrounding Conditions.
Conditions to be taken into consideration when identifying the scope of a hazardous materials/WMD incident, including but not limited to topography; land use, including utilities and fiber-optic cables; accessibility; weather conditions; bodies of water, including recharge ponds; public exposure potential; patient presentation; overhead and underground wires and pipelines; storm and sewer drains; possible ignition sources; adjacent land use such as rail lines, highways, and airports; and the nature and extent of injuries.

3.3.66* Termination.
That portion of incident management after the cessation of tactical operations in which personnel are involved in documenting safety procedures, site operations, hazards faced, and lessons learned from the incident and include specifications for debriefing, post-incident analysis and critique in a specific sequence: critique, debriefing, and post-incident analysis.

3.3.66.1 Critique.
An element of incident termination that examines the overall effectiveness of the emergency response effort and develops recommendations for improvement.

3.3.66.2 Debriefing.
An element of incident termination that focuses on the following: (1) informing responders exactly what hazmat they were (possibly) exposed to and the signs and symptoms of exposure; (2) identifying damaged equipment requiring replacement or repair; (3) identifying equipment or supplies requiring specialized decontamination or disposal; (4) identifying unsafe work conditions; (5) assigning information-gathering responsibilities for a post-incident analysis.

3.3.66.3 Post-Incident Analysis.
An element of incident termination that includes completion of the required incident reporting forms, determining the level of financial responsibility, and assembling documentation for conducting a critique.

3.3.67* UN/NA Identification Number.
The four-digit number assigned to a hazardous material/weapon of mass destruction (WMD), which is used to identify and cross-reference products in the transportation mode.

3.3.68* Weapon of Mass Destruction (WMD).
(1) Any destructive device, such as any explosive, incendiary, or poison gas bomb, grenade, rocket having a propellant charge of more than four ounces, missile having an explosive or incendiary charge of more than one quarter ounce (7 grams), mine, or device similar to the preceding description; (2) any weapon involving toxic or poisonous chemicals; (3) any weapon involving a disease organism; or (4) any weapon that is designed to release radiation or radioactivity at a level dangerous to human life.

3.3.68.1* Radiological Weapons of Mass Destruction.
3.3.68.1.1* Improvised Nuclear Device (IND).
An illicit nuclear weapon that is bought, stolen, or otherwise obtained from a nuclear state (that is i.e., a national government with nuclear weapons), or a weapon fabricated from fissile material that is capable of producing a nuclear explosion.

3.3.68.1.2* Radiation Dispersal Device (RDD).
A device designed to spread radioactive material through a detonation of conventional explosives or other means.

3.3.68.1.3* Radiation Exposure Device (RED).
A device intended to cause harm by exposing people to radiation without spreading radioactive material.

Supplemental Information

<table>
<thead>
<tr>
<th>File Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>472_SR-21_Chapter_3_FINAL.docx</td>
<td>annex material</td>
</tr>
</tbody>
</table>

Submitter Information Verification

Submitter Full Name: Thomas McGowan
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Submittal Date: Tue Oct 11 07:24:11 EDT 2016
Committee Statement

Committee Statement: Consistency between all hazardous materials/WMD documents.

Response Message:

Public Comment No. 13-NFPA 472-2016 [Section No. 3.3.16.2]
Public Comment No. 8-NFPA 472-2016 [Sections 3.3, 3.4, 3.5]

Ballot Results

✓ This item has passed ballot

32 Eligible Voters
0 Not Returned
30 Affirmative All
  2 Affirmative with Comments
0 Negative with Comments
0 Abstention

Affirmative All
Baxter, Christina M.
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Royall, Jr., Robert W.
Schnepp, Rob
Simpson, Danny G.
Terryn, Fred C.
Tracy, Christopher
Uzeloc, Kenneth W.
Wright, Charles J.

Affirmative with Comment
Emery, Richard B.
The definition for a "Confined Space" should match 1910.146 because the word "member" could be misunderstood. The standard uses the word "employee" but perhaps "person" or "individual" would be better.

Makins, Jr., Carl
agree with committee statement
5.2.1.1.2
Given examples of the following liquids-holding containers, the operations level responder shall identify each container by type, as follows:

(1) Bulk fixed facility tanks
(2) Low-pressure tank cars
(3) Nonpressure liquid cargo tanks
(4) Low-pressure chemical cargo tanks
(5) 101 and 102 intermodal tanks
(6) Flexible intermediate bulk containers/rigid intermediate bulk containers (FIBCs/RIBCs)
(7) Flexible bladders
(8) Drums
(9) Bottles, flasks, carboys

5.2.1.1.3
Given examples of the following solids-holding containers, the operations level responder shall identify each container by type, as follows:

(1) Bulk fixed facilities
(2) Railway gondolas, coal cars
(3) Dry bulk cargo trailers
(4) Intermodal containers (reactive solids)
(5) FIBCs/RIBCs
(6) Drums
(7) Bags, bottles, boxes

Submitter Information Verification

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Street Address: 
City: 
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Zip: 
Submittal Date: Tue Sep 27 20:42:24 EDT 2016

Committee Statement
Committee Statement: Spelling out the terms.
Response Message:
Public Comment No. 1-NFPA 472-2016 [Section No. 5.2.1.1.3]

Ballot Results

✅ This item has passed ballot

32 Eligible Voters
0 Not Returned
31 Affirmative All
1 Affirmative with Comments
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Affirmative All
Baxter, Christina M.
Bevelacqua, Armando S.
Carr, H. K.
Carrasco, Jorge A.
Clawson, Tom
Coffey, William R.
Collins, K. Wade
D’Onofrio, Cris
Edinger, Richard C.
Emery, Richard B.
Haberkorn, Clay
Hergenreter, Steven
Ingram, Robert J.
Kreutzer, Kristina
Lilley, Troy
McNett, Wayne
Miller, Ryan K.
Miller, Leslie A.
Miller, Thomas D.
Minson, Matthew
Noll, Gregory G.
Porter, John F.
Preston, Lawrence L.
Rehak, Timothy R.
Royall, Jr., Robert W.
Schnep, Rob
Simpson, Danny G.
Terryn, Fred C.
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<td>Uzeloc, Kenneth W.</td>
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<td>Wright, Charles J.</td>
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**Affirmative with Comment**

Makins, Jr., Carl

agree with committee statement
5.2.1.1.5
Given examples of the following packaging containers, the operations level responder shall identify the characteristics of each container or package by type as follows:

1. Intermediate bulk container (IBC)
2. Ton container

5.2.1.1.6*
Given examples of the following radioactive material packages containers, the operations level responder shall identify the characteristics of each container or package by type, as follows:

1. Excepted (package)
2. Industrial (package)
3. Type A (package)
4. Type B (package)
5. Type C (package)
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<tr>
<th>Bevelacqua, Armando S.</th>
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<td>Wright, Charles J.</td>
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</table>
5.2.1.6.6
Identify at least four indicators of possible criminal or terrorist activity involving illicit laboratories (e.g., clandestine laboratories, weapons lab, explosive lab, or ricin biological lab).

Submitter Information Verification

Submitter Full Name: Thomas McGowan
Organization: National Fire Protection Assoc
Street Address: 
City: 
State: 
Zip: 
Submittal Date: Tue Sep 27 21:01:19 EDT 2016

Committee Statement

Committee Statement: clarifying types of labs.
Response Message:

Ballot Results

✔ This item has passed ballot

32 Eligible Voters
0 Not Returned
30 Affirmative All
2 Affirmative with Comments
0 Negative with Comments
0 Abstention

Affirmative All
Baxter, Christina M.
Bevelacqua, Armando S.
Carr, H. K.
Carrasco, Jorge A.
Clawson, Tom
Coffey, William R.
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Royall, Jr., Robert W.
Schnep, Rob
Simpson, Danny G.
Terryn, Fred C.
Tracy, Christopher
Uzeloc, Kenneth W.

Affirmative with Comment
Makins, Jr., Carl
agree with committee statement
Wright, Charles J.

Spell out "laboratories" in the three locations where the abbreviation "labs" is found.
5.2.1.7

The operations level responder shall describe ways in which emergency responders are exposed to toxic products of combustion.

Submitter Information Verification

Submitter Full Name: Thomas McGowan
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Sat Oct 22 04:45:51 EDT 2016

Committee Statement

Committee Statement: In order to understand the decontamination process the responder has to also describe ways in which exposure takes place.

Response Message:

Ballot Results

This item has passed ballot

32 Eligible Voters
0 Not Returned
31 Affirmative All
1 Affirmative with Comments
0 Negative with Comments
0 Abstention

Affirmative All
Baxter, Christina M.
Bevelacqua, Armando S.
Carr, H. K.
Carrasco, Jorge A.
Clawson, Tom
Coffey, William R.
Collins, K. Wade
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Rehak, Timothy R.
Royall, Jr., Robert W.
Schnepp, Rob
Simpson, Danny G.
Terryn, Fred C.
Tracy, Christopher
Uzeloc, Kenneth W.
Wright, Charles J.

Affirmative with Comment
Makins, Jr., Carl
agree with committee statement
5.2.2 Collecting Hazard and Response Information.

Given scenarios involving known hazardous materials/WMD, the operations level responder shall collect hazard and response information from SDS, CHEMTREC/CANUTEC/SETIQ, governmental authorities, and manufacturers, shippers, and carriers by completing the following requirements:

1. Match the definitions associated with the hazard classes and divisions of hazardous materials/WMD, including refrigerated liquefied gases and cryogenic liquids, with the designated class or division.

2. Identify two ways to obtain an SDS in an emergency.

3. Using an SDS for a specified material, identify the following hazard and response information:
   - Identification, including supplier identifier and emergency telephone number
   - Hazard identification
   - Composition/information on ingredients
   - First aid measures
   - Fire-fighting measures
   - Accident release measures
   - Handling and storage
   - Exposure controls/personal protection
   - Physical and chemical properties
   - Stability and reactivity
   - Toxicological information
   - Ecological information (nonmandatory)
   - Disposal considerations (nonmandatory)
   - Transport information (nonmandatory)
   - Regulatory information (nonmandatory)
   - Other information

4. Identify the types of assistance provided by, procedure for contacting, and information to be provided to CHEMTREC/CANUTEC/SETIQ and governmental authorities.

5. Identify two methods of contacting manufacturers, shippers, and carriers (highway, rail, marine, air, and pipeline) to obtain hazard and response information.

6. Identify the type of assistance provided by governmental authorities with respect to criminal or terrorist activities involving the release or potential release of hazardous materials/WMD.

Submitter Information Verification

Submitter Full Name: Thomas McGowan
Organization: National Fire Protection Assoc
Street Address: 
City: 
State: 
Zip: 
Submittal Date: Tue Sep 27 21:03:37 EDT 2016
Committee Statement

Committee Statement: consistency between documents.

Response Message:

Ballot Results

✔ This item has passed ballot

32 Eligible Voters
0 Not Returned
31 Affirmative All
  1 Affirmative with Comments
0 Negative with Comments
0 Abstention

Affirmative All
Baxter, Christina M.
Bevelacqua, Armando S.
Carr, H. K.
Carrasco, Jorge A.
Clawson, Tom
Coffey, William R.
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Royall, Jr., Robert W.
Schnepf, Rob
Simpson, Danny G.
Terryn, Fred C.
Tracy, Christopher
Uzeloc, Kenneth W.
Wright, Charles J.

**Affirmative with Comment**
Makins, Jr., Carl
agree with committee statement
5.2.3* Predicting the Likely Behavior of a Material and Its Container.
Given scenarios involving hazardous materials/WMD incidents, each with a single hazardous material/WMD, the operations level responder shall describe the likely behavior of the material or agent and its container by completing the following requirements:

(1) Use the hazard and response information obtained from the current edition of the ERG, SDS, CHEMTREC/CANUTEC/SETIQ, governmental authorities, and manufacturer, shipper, and carrier contacts, as follows:

(a)* Match the following chemical and physical properties with their significance and impact on the behavior of the container and its contents:

i. Boiling point
ii. Chemical reactivity
iii. Corrosivity (pH)
iv. Flammable (explosive) range [lower explosive limit (LEL) and upper explosive limit (UEL)]
v. Flash point
vi. Ignition (autoignition) temperature
vii. Particle size
viii. Persistence
ix. Physical state (solid, liquid, gas)
x. Radiation (ionizing and nonionizing)
xii. Toxic products of combustion
xiii. Vapor density
xiv. Vapor pressure
xv. Water solubility
xvi. Polymerization
xvii. Expansion ratio
xviii. Biological agents and toxins

(b) Identify the differences between the following terms:

i. Contamination and secondary contamination
ii. Exposure and contamination
iii. Exposure and hazard
iv. Infectious and contagious
v. Acute effects and chronic effects
vi. Acute exposures and chronic exposures

(2)* Identify types of stress that can cause a container system to release its contents (thermal, mechanical, and chemical).

(3)* Identify ways containers can breach (disintegration, runaway cracking, closures open up, punctures, and splits or tears).

(4)* Identify ways containers can release their contents (detonation, violent rupture, rapid relief, spill, or leak).

(5)* Identify dispersion patterns that can be created upon release of a hazardous material (hemispherical, cloud, plume, cone, stream, pool, and irregular).

(6)* Identify the time frames for estimating the duration that hazardous materials/WMD will present an exposure risk (short-term, medium-term, and long-term).

(7)* Identify the health and physical hazards that could cause harm.
Supplemental Information

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<td>annex material</td>
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Submitter Information Verification

Submitter Full Name: Thomas McGowan  
Organization: National Fire Protection Assoc  
Street Address: 
City: 
State: 
Zip: 
Submittal Date: Tue Sep 27 21:26:06 EDT 2016

Committee Statement

Committee Statement: Includes terms for Ops level competencies based on ERG and other reference material.  
Response Message:  
Public Comment No. 2-NFPA 472-2016 [Section No. 5.2.3]

Ballot Results

✔ This item has passed ballot

32 Eligible Voters  
0 Not Returned  
31 Affirmative All  
1 Affirmative with Comments  
0 Negative with Comments  
0 Abstention

Affirmative All

Baxter, Christina M.  
Bevelacqua, Armando S.  
Carr, H. K.  
Carrasco, Jorge A.  
Clawson, Tom  
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Royall, Jr., Robert W.
Schnepp, Rob
Simpson, Danny G.
Terryn, Fred C.
Tracy, Christopher
Uzeloc, Kenneth W.
Wright, Charles J.

**Affirmative with Comment**
Makins, Jr., Carl
agree with committee statement
5.3.4* Identifying Emergency Decontamination Issues.

Given scenarios involving hazardous materials/WMD incidents, the operations level responder shall identify when emergency decontamination is needed by completing the following requirements:

1. Identify ways that people, PPE, apparatus, tools, and equipment become contaminated.

2. Describe how the potential for secondary contamination determines the need for emergency decontamination.

3. Explain the importance, differences, and limitations of emergency/field expedient, gross, technical, and mass decontamination procedures at hazardous materials incidents.

4. Identify the purpose of emergency decontamination procedures at hazardous materials incidents. Identify the tools and equipment required for emergency decontamination.

Submitter Information Verification

Submitter Full Name: Thomas McGowan
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Sat Oct 22 04:49:25 EDT 2016

Committee Statement

Committee Statement: Statements clarify the of the decontamination process and further define on-scene decontamination versus other types of decontamination procedures

Ballot Results

✔ This item has passed ballot

32 Eligible Voters
0 Not Returned
31 Affirmative All
1 Affirmative with Comments
0 Negative with Comments
0 Abstention

Affirmative All
Baxter, Christina M.
Bevelacqua, Armando S.
Carr, H. K.
Carrasco, Jorge A.
Clawson, Tom
Coffey, William R.
Collins, K. Wade
D’Onofrio, Cris
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Royall, Jr., Robert W.
Schnep, Rob
Simpson, Danny G.
Terryn, Fred C.
Tracy, Christopher
Uzeloc, Kenneth W.
Wright, Charles J.

Affirmative with Comment
Makins, Jr., Carl
agree with committee statement
6.6.1.2.2

Given a hazardous materials/WMD incident with release of product; an assignment in an IAP; the scope of the problem; policies and procedures; approved tools, equipment, control agents, and PPE; and access to a hazardous materials technician, an allied professional, an emergency response plan, or standard operating procedures, the operations level responder assigned to perform product control shall be able to perform the following tasks:

1. Select techniques to control releases with limited risk of personal exposure at hazardous materials/WMD incidents within the capabilities and competencies of available personnel, tools and equipment, control agents, and PPE, in accordance with the AHJ policies and procedures, by completing the following requirements:
   a. Describe control techniques to confine/contain released product with limited risk of personal exposure available to the operations level responder.
   b. Describe the location and operation of remote control/emergency shutoff devices on cargo tanks, and intermodal containers, and containers at fixed facilities containing flammable liquids and gases.
   c. Describe the characteristics and applicability of available control agents and equipment available for controlling flammable liquid and flammable gas releases.

2. Implement selected techniques for controlling released product with limited risk of personnel exposure at the incident following safety procedures, avoiding or minimizing hazards, and protecting exposures and personnel.


Submitter Information Verification

Submitter Full Name: Thomas McGowan
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Tue Sep 27 21:43:44 EDT 2016

Committee Statement

Committee Statement: Consistency between documents
Response Message:

Ballot Results

Yes, This item has passed ballot
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<td>Negative with Comments</td>
<td>0</td>
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<td>Abstention</td>
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**Affirmative All**
- Baxter, Christina M.
- Bevelacqua, Armando S.
- Carr, H. K.
- Carrasco, Jorge A.
- Clawson, Tom
- Coffey, William R.
- Collins, K. Wade
- D’Onofrio, Cris
- Edinger, Richard C.
- Emery, Richard B.
- Haberkorn, Clay
- Hergenreter, Steven
- Ingram, Robert J.
- Kreutzer, Kristina
- Lilley, Troy
- McNett, Wayne
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- Miller, Thomas D.
- Minson, Matthew
- Noll, Gregory G.
- Porter, John F.
- Preston, Lawrence L.
- Rehak, Timothy R.
- Royall, Jr., Robert W.
- Schnepf, Rob
- Simpson, Danny G.
- Terryn, Fred C.
- Tracy, Christopher
- Uzeloc, Kenneth W.
- Wright, Charles J.

**Affirmative with Comment**
- Makins, Jr., Carl
agree with committee statement
6.6.3.1 Selecting Product Control Techniques.

Given examples of hazardous materials/WMD incidents, the operations level responder assigned to perform product control with limited risk of personal exposure shall select techniques to confine or contain releases of hazardous materials/WMD and to control flammable liquid and flammable gas releases within the capabilities and competencies of available personnel, tools and equipment, PPE, and control agents and equipment in accordance with the AHJ’s policies and procedures by completing the following requirements:

1. Explain the importance of working under the guidance of a hazardous materials technician, an allied professional, an emergency response plan, or standard operating procedures.

2. Explain the difference between control, confinement, containment, and extinguishment.

3. Describe the product control techniques available to the operations level responder.

4. Describe the application, necessary tools, equipment, control agents, and safety precautions associated with each of the following control techniques:
   (a) Absorption
   (b) Adsorption
   (c) Damming
   (d) Diking
   (e) Dilution
   (f) Diversion
   (g) Remote valve shutoff
   (h) Retention
   (i) Vapor dispersion
   (j) Vapor suppression

5. Identify and describe the use of tools and equipment provided by the AHJ for product control, including Class B foam application equipment, diking equipment, damming equipment, approved absorbent materials and products, shovels and other hand tools, piping, heavy equipment (such as backhoes), floats, and spill booms and control agents, including Class B foam and dispersal agents.

6. Identify the characteristics and applicability of the following Class B foams if supplied by the AHJ:
   (a) Aqueous film-forming foam (AFFF)
   (b) Alcohol-resistant concentrates
   (c) Fluoroprotein
   (d) High-expansion foam

7. Identify the location and describe the operation of remote control/emergency shutoff devices to contain flammable liquid and flammable gas releases on cargo tanks on MC/DOT-306/406, MC/DOT-307/407, and MC-331 cargo tanks, intermodal containers, and containers at fixed facilities.

8. Describe the safety precaution associated with each product control technique.
Submitter Information Verification

Submitter Full Name: Thomas McGowan
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Tue Sep 27 21:47:27 EDT 2016

Committee Statement

Committee Statement: Consistency between documents
Response Message:

Ballot Results

✓ This item has passed ballot

32 Eligible Voters
0 Not Returned
31 Affirmative All
1 Affirmative with Comments
0 Negative with Comments
0 Abstention

Affirmative All
Baxter, Christina M.
Bevelacqua, Armando S.
Carr, H. K.
Carrasco, Jorge A.
Clawson, Tom
Coffey, William R.
Collins, K. Wade
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Royall, Jr., Robert W.
Schneppe, Rob
Simpson, Danny G.
Terryn, Fred C.
Tracy, Christopher
Uzeloc, Kenneth W.
Wright, Charles J.

**Affirmative with Comment**

Makins, Jr., Carl

agree with committee statement
Second Revision No. 22-NFPA 472-2016 [ Section No. 6.6.4.1 ]

6.6.4.1 Performing Product Control Techniques.

Given the selected product control technique and the tools and equipment, PPE, and control agents and equipment provided by the AHJ, at a hazardous materials/WMD incident, the operations level responder assigned to perform product control shall implement the product control technique to confine/contain the release with limited risk of personal exposure by completing the following requirements:

1. Using the tools and equipment provided by the AHJ, perform the following product control techniques following safety procedures, protecting exposures and personnel, and avoiding or minimizing hazards:
   
   a. Operate remote control/emergency shutoff devices to reduce or stop the flow of hazardous material from MC-306/DOT-406, MC-407/DOT-407, and MC-331 cargo tanks, intermodal containers, tanks, and containers at fixed facilities containing flammable liquids or gases

Submitter Information Verification

Submitter Full Name: Thomas McGowan
Organization: National Fire Protection Assoc
Street Address:  
City:  
State:  
Zip:  
Submittal Date: Fri Oct 21 04:29:51 EDT 2016

Committee Statement

Committee Statement: corrected terminology for consistency within the document
Response Message:

Ballot Results

✅ This item has passed ballot

32 Eligible Voters
0 Not Returned
31 Affirmative All
   1 Affirmative with Comments
0 Negative with Comments
0 Abstention

Affirmative All
Baxter, Christina M.
Bevelacqua, Armando S.
7.2.1.2* Detection, Monitoring, and Sampling.
Given a hazardous materials/WMD incident with released identified and unidentified hazardous materials, an assignment in an IAP, policies and procedures, and approved resources, detection and monitoring equipment, and PPE, the hazardous materials technician shall, through detection, monitoring, and sampling, classify hazardous materials/WMD by the basic categories; verify the presence of hazardous material; determine the concentration of hazardous materials in the atmosphere; collect samples of solids, liquids, and gases; and read, interpret, record, and communicate the results of detection and monitoring equipment by completing the following tasks:

(1) Select equipment for detection, monitoring, and sampling solids, liquids, and gases suitable for the hazardous materials/WMD present at the incident within the capabilities and competencies of available personnel, approved resources including detection, monitoring, and sampling equipment, and PPE in accordance with the AHJ’s policies and procedures.

(a) Identify the basic hazard categories and their definitions, e.g., for example, biological, corrosivity, energy (explosivity, radioactivity, reactivity), flammability, oxygen concentration, thermal (heat and cold), and toxicity.

(b) Describe monitoring technologies.

(c) Describe the types of detection and monitoring equipment including colorimetric (e.g., tubes, chips, papers, strips, reagents), electrochemical cells (e.g., toxic gas sensors), flammable gas/LEL, noncontact thermal detection device, oxygen concentration, photoionization detector (PID), biological detection (e.g., immunoassays, protein tests), and radiation detection and monitoring including the following:
   
   i. Application, capabilities, and limitations
   
   ii. Application of ionization potential (ip) when using a PID
   
   iii. Procedures operating the equipment, including field testing, safety precautions, and action levels

(d) Describe the process for classifying basic hazard categories of identified solid and liquid materials and unidentified contaminants in the atmosphere.

(e) Describe the following processes for radioactive materials:
   
   i. Determine radiation dose rates from radioactive material labels.
   
   ii. Determine background, rate, and dose.
   
   iii. Determine if a radioactive materials container is leaking/breached by comparing meter readings to the Transportation Index (TI).

(f) Describe the process for monitoring lighter-than-air gases and vapors, heavier-than-air gases and vapors in a confined area, and heavier-than-air gases and vapors in an unconfined area.

(g) Describe the methods for collecting samples of solids, liquids, and gases.

(h) Describe the procedures for reading, interpreting, recording, and communicating test results of detection and monitoring equipment.

(i) Describe the field maintenance and testing procedures for detection and monitoring equipment.

(j) Describe the procedures for decontaminating detection, monitoring, and sampling equipment according to manufacturer’s recommendations or AHJ policies and procedures.

(k) Procedures Describe the procedures for maintaining detection, monitoring, and sampling equipment according to manufacturers’ specifications or local policies and procedures.

(2) Using the selected detection and monitoring equipment [colorimetric (e.g., tubes, chips, papers, strips, reagents), electrochemical cells (e.g., toxic gas sensors), flammable gas/LEL, noncontact thermal detection device, oxygen concentration, photoionization detector (PID), and radiation detection and monitoring devices], biological detection (if provided by the AHJ), radiation detection monitoring devices (e.g., a contamination measuring instrument or instruments able to measure alpha, beta, and gamma radiation, pancake Geiger-Mueller), exposure rate instrument (e.g., instruments able to measure a range of exposure rate), dosimetry devices (e.g., personnel radiation monitors/devices), perform the following detection, monitoring, and sampling tasks following safety procedures, avoiding or minimizing hazards, and protecting exposures and personnel:

(a) Field test the detection, monitoring, and sampling equipment to be used according the
manufacturers’ specification and local policies and procedures including the following:

i. Functional (i.e., bump) test
ii. Calibration
iii. Other required tests

(b) Classify hazardous materials by basic hazard categories.
(c) Verify the presence of hazardous materials.
(d) Determine the concentration of hazardous materials in the atmosphere.
(e) Collect samples of solids, liquids, and gases.
(f) Monitor, read, interpret, record, and communicate readings from the equipment.
(g) Decontaminate detection, monitoring, and sampling equipment.
(h) Report and document detection, monitoring, and sampling activities.

Submitter Information Verification

Submitter Full Name: Thomas McGowan
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Tue Sep 27 22:01:19 EDT 2016

Committee Statement

Committee Statement: The recommended radiation detection and monitoring equipment is necessary for a safe, effective response. Additionally biological monitoring is limited to the AHJ having the equipment.

This is to correct an inadvertent mistake during second revision. "biological detection" should be added and the information in the parentheses should follow.

Response Message:

Public Comment No. 3-NFPA 472-2016 [Section No. 7.2.1.2]

Ballot Results

✅ This item has passed ballot

31 Eligible Voters
10 Not Returned
20 Affirmative All
  1 Affirmative with Comments
0 Negative with Comments
0 Abstention

Not Returned
Baxter, Christina M.
Carr, H. K.
Carrasco, Jorge A.  
Clawson, Tom  
Collins, K. Wade  
D'Onofrio, Cris  
Emery, Richard B.  
Ingram, Robert J.  
McNett, Wayne  
Minson, Matthew  

**Affirmative All**  
Coffey, William R.  
Edinger, Richard C.  
Haberkorn, Clay  
Haskell, III, William E.  
Hopkins, Richard  
Lilley, Troy  
Makins, Jr., Carl  
Miller, Ryan K.  
Miller, Leslie A.  
Noll, Gregory G.  
Porter, John F.  
Preston, Lawrence L.  
Rehak, Timothy R.  
Royall, Jr., Robert W.  
Schnepf, Rob  
Simpson, Danny G.  
Terryn, Fred C.  
Tracy, Christopher  
Uzeloc, Kenneth W.  
Wright, Charles J.  

**Affirmative with Comment**  
Miller, Thomas D.  

Vote in the affirmative so that the intent of the TC is reflected.
Carr, H. K.
Carrasco, Jorge A.
Clawson, Tom
Coffey, William R.
Collins, K. Wade
D'Onofrio, Cris
Edinger, Richard C.
Emery, Richard B.
Haberkorn, Clay
Hergenreter, Steven
Ingram, Robert J.
Kreutzer, Kristina
Lilley, Troy
McNett, Wayne
Miller, Ryan K.
Miller, Leslie A.
Miller, Thomas D.
Minson, Matthew
Noll, Gregory G.
Porter, John F.
Preston, Lawrence L.
Rehak, Timothy R.
Royall, Jr., Robert W.
Schnepp, Rob
Simpson, Danny G.
Terryn, Fred C.
Tracy, Christopher
Uzeloc, Kenneth W.
Wright, Charles J.

**Affirmative with Comment**

Makins, Jr., Carl
agree with committee statement
<table>
<thead>
<tr>
<th>Term</th>
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<tbody>
<tr>
<td>(1) Air reactivity</td>
</tr>
<tr>
<td>(2) Autorefrigeration</td>
</tr>
<tr>
<td>(3) Boiling point</td>
</tr>
<tr>
<td>(4) Catalyst</td>
</tr>
<tr>
<td>(5) Chemical change</td>
</tr>
<tr>
<td>(6) Chemical interactions</td>
</tr>
<tr>
<td>(7) Compound, mixture</td>
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<tr>
<td>(8) Concentration</td>
</tr>
<tr>
<td>(9) Corrosive (acids and bases/alkaline)</td>
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<tr>
<td>(10) Critical temperature</td>
</tr>
<tr>
<td>(11) Cryogenic liquid heat transfer processes (conduction, convection, radiation, and direct contact)</td>
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<tr>
<td>(12) Liquid heat transfer processes; conduction, convection, radiation, and direct contact (e.g., with cryogenic)</td>
</tr>
<tr>
<td>(13) Decomposition temperature</td>
</tr>
<tr>
<td>(14) Dose</td>
</tr>
<tr>
<td>(15) Dose response</td>
</tr>
<tr>
<td>(16) Endothermic</td>
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<tr>
<td>(17) Evaporation rate</td>
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<td>(18) Exothermic</td>
</tr>
<tr>
<td>(19) Expansion ratio</td>
</tr>
<tr>
<td>(20) Half-life</td>
</tr>
<tr>
<td>(21) Inhibitor</td>
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<tr>
<td>(22) Maximum safe storage temperature (MSST)</td>
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<td>(23) Melting point and freezing point</td>
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<td>(24) Miscibility</td>
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<tr>
<td>(25) Odor and odor threshold</td>
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<td>(26) Organic and inorganic</td>
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<tr>
<td>(27) pH</td>
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<tr>
<td>(28) Physical change</td>
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<tr>
<td>(29) Radioactivity</td>
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<td>(30) Reactivity</td>
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<tr>
<td>(31) Relative density</td>
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<td>(32) Self-accelerating decomposition temperature (SADT)</td>
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<td>(33) Solubility</td>
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<td>(34) Solution and slurry</td>
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<td>(35) Strength</td>
</tr>
<tr>
<td>(36) Sublimation</td>
</tr>
<tr>
<td>(37) Temperature of product</td>
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<tr>
<td>(38) Volatility</td>
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<td>(39) Viscosity</td>
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</table>
Submitter Information Verification

Submitter Full Name: Thomas McGowan
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Sun Oct 23 06:47:27 EDT 2016

Committee Statement

Committee Statement: Additional need to have an understanding of these terms as a technician.
Response Message:

Ballot Results

✔ This item has passed ballot

32 Eligible Voters
0 Not Returned
31 Affirmative All
1 Affirmative with Comments
0 Negative with Comments
0 Abstention

Affirmative All
Baxter, Christina M.
Bevelacqua, Armando S.
Carr, H. K.
Carrasco, Jorge A.
Clawson, Tom
Coffey, William R.
Collins, K. Wade
D’Onofrio, Cris
Edinger, Richard C.
Emery, Richard B.
Haberkorn, Clay
Hergenreter, Steven
Ingram, Robert J.
Kreutzer, Kristina
Lilley, Troy
McNett, Wayne
Miller, Ryan K.
Miller, Leslie A.
Affirmative with Comment

Makins, Jr., Carl
agree with committee statement
Competencies for the Hazardous Materials Technicians with a Radioactive Material Specialty

Submitter Information Verification

Submitter Full Name: Thomas McGowan
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Tue Sep 27 22:07:25 EDT 2016

Committee Statement

Committee Statement: Consistency within document chapter titles
Response Message:
Public Comment No. 14-NFPA 472-2016 [Chapter 18]

Ballot Results

This item has passed ballot

32 Eligible Voters
0 Not Returned
31 Affirmative All
1 Affirmative with Comments
0 Negative with Comments
0 Abstention

Affirmative All
Baxter, Christina M.
Bevelacqua, Armando S.
Carr, H. K.
Carrasco, Jorge A.
Clawson, Tom
Coffey, William R.
Collins, K. Wade
D'Onofrio, Cris
Edinger, Richard C.
Emery, Richard B.
Haberkorn, Clay
Hergenreter, Steven
Ingram, Robert J.
Kreutzer, Kristina
Lilley, Troy
McNett, Wayne
Miller, Ryan K.
Miller, Leslie A.
Miller, Thomas D.
Minson, Matthew
Noll, Gregory G.
Porter, John F.
Preston, Lawrence L.
Rehak, Timothy R.
Royall, Jr., Robert W.
Schnepf, Rob
Simpson, Danny G.
Terryn, Fred C.
Tracy, Christopher
Uzeloc, Kenneth W.
Wright, Charles J.

**Affirmative with Comment**

Makins, Jr., Carl

agree with committee statement
18.2.1 Understanding Nuclear Science and Radioactivity.
Technicians with a radioactive material specialty shall have an understanding of nuclear science and radioactivity, including the units and terms used to describe radiation and radioactive material by completing the following tasks:

1. Define the following terms:
   - Ionization
   - Nucleon
   - Nuclide
   - Isotope
   - Excitation
   - Bremsstrahlung
   - Fission
   - Fusion
   - Criticality
   - Curie
   - Becquerel
   - Specific activity
   - Half-life
   - Exposure
   - Absorbed dose
   - Dose equivalent
   - Quality factor
   - Roentgen
   - Rad/gray
   - Rem/sievert

2. Identify the basic principles of the mass-energy equivalence concept.

3. Identify how the neutron-to-proton ratio is related to nuclear stability.

4. Define the following terms related to nuclear stability:
   - Radioactivity
   - Radioactive decay

5. Explain the characteristics of alpha, beta, gamma, and neutron radiations and the methods by which they interact with matter.

6. Define the term radiation dispersal device (RDD).

7. Define the term radiation exposure device (RED).

8. Define the term improvised nuclear device (IND).

9. Using reference documents or computer applications, identify the following for a given nuclide:
   - Atomic number
   - Atomic mass
   - Stability
   - Half-life
   - Types and energies of radioactive emissions
   - The decay chain and stable end-product of a radioactive nuclide

Given the Chart of Nuclides, trace the decay of a radioactive nuclide and identify the stable
(10) Name examples of materials best suited as shielding from the following types of radiation:

(a) Alpha
(b) Beta
(c) Gamma
(d) Neutron

(11) Explain the concept of linear energy transfer (LET).

Submitter Information Verification

Submitter Full Name: Thomas McGowan
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Street Address:
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Submittal Date: Tue Sep 27 22:11:08 EDT 2016

Committee Statement

Committee Statement: Clarification:

Item (10) state "Given the Chart of the Nuclides...," but this document is simply one example of a computer program or reference document that can be used to accomplish all of the specific items also listed in Section (9) a-e. And other computer programs and reference documents can also be used to identify the decay chain and final stable end product of a radioactive nuclide. Specifying "The Chart of the Nuclides" is unnecessary and restive when other documents and resources also exist. "The Chart of the Nuclides" should be added to the Annex as an example of an appropriate reference document.

Response Message:

Public Comment No. 15-NFPA 472-2016 [Section No. 18.2.1]

Ballot Results

✔ This item has passed ballot

32 Eligible Voters
0 Not Returned
31 Affirmative All
1 Affirmative with Comments
0 Negative with Comments
0 Abstention

Affirmative All
Baxter, Christina M.
Bevelacqua, Armando S.
Carr, H. K.
Carrasco, Jorge A.
Clawson, Tom
Coffey, William R.
Collins, K. Wade
D’Onofrio, Cris
Edinger, Richard C.
Emery, Richard B.
Haberkorn, Clay
Hergenreter, Steven
Ingram, Robert J.
Kreutzer, Kristina
Lilley, Troy
McNett, Wayne
Miller, Ryan K.
Miller, Leslie A.
Miller, Thomas D.
Minson, Matthew
Noll, Gregory G.
Porter, John F.
Preston, Lawrence L.
Rehak, Timothy R.
Royall, Jr., Robert W.
Schnepp, Rob
Simpson, Danny G.
Terryn, Fred C.
Tracy, Christopher
Uzeloc, Kenneth W.
Wright, Charles J.

Affirmative with Comment
Makins, Jr., Carl
agree with committee statement
18.3.2 Internal Exposure Control.

Given the analysis of an incident involving radioactive material, technicians with a radioactive material specialty shall determine the response options needed to minimize internal exposure to radioactive material by completing the following tasks:

1. Define the terms annual limit on intake (ALI) and derived air concentration (DAC)
2. Define the terms reference man, reference woman, and reference child
3. Describe three factors that govern the behavior of radioactive materials in the body
4. Explain the two natural mechanisms that reduce the quantity of a radionuclide in the body
5. Explain the relationship of physical, biological, and effective half-lives
6. Given the physical and biological half-lives, calculate the effective half-life
7. Describe methods used to increase the elimination rate of radioactive materials from the body

Submitter Information Verification

Submitter Full Name: Thomas McGowan
Organization: National Fire Protection Assoc
Street Address: 
City: 
State: 
Zip: 
Submittal Date: Tue Sep 27 22:12:45 EDT 2016

Committee Statement

Committee Statement: Unnecessary and unrelated addition to this competency.

For this specific competency, the responder needs to know what the ALI's and DACs are, how to use them to estimate potential doses to responders, and that these values were originally based on the concept of a Reference Man. Reference Woman and Child had nothing to do with ALI's and DACs. And the ALI and DAC values would NOT be legitimate to use in collaboration with the Reference Woman and Child models - they do not correlate.

While the International Commission on Radiological Protection (ICRP) has developed models for a reference woman and child, the addition of these two terms as "required" for the competency is not really true. Also, the ICRP did not stop at Reference Woman and Child. There's also Reference Western Woman, Eastern Woman, Pregnant Woman, fetus, newborn, adolescent, etc. etc. - it goes non and on. Should we include all of those as well?

No.

Response Message:

Public Comment No. 19-NFPA 472-2016 [Section No. 18.3.2]
This item has passed ballot

32 Eligible Voters
0 Not Returned
31 Affirmative All
  1 Affirmative with Comments
  0 Negative with Comments
  0 Abstention

Affirmative All
Baxter, Christina M.
Bevelacqua, Armando S.
Carr, H. K.
Carrasco, Jorge A.
Clawson, Tom
Coffey, William R.
Collins, K. Wade
D’Onofrio, Cris
Edinger, Richard C.
Emery, Richard B.
Haberkorn, Clay
Hergenreter, Steven
Ingram, Robert J.
Kreutzer, Kristina
Lilley, Troy
McNett, Wayne
Miller, Ryan K.
Miller, Leslie A.
Miller, Thomas D.
Minson, Matthew
Noll, Gregory G.
Porter, John F.
Preston, Lawrence L.
Rehak, Timothy R.
Royall, Jr., Robert W.
Schnepf, Rob
Simpson, Danny G.
Terryn, Fred C.
Tracy, Christopher
Uzeloc, Kenneth W.
Wright, Charles J.

National Fire Protection Association Report
http://submittals.nfpa.org/TerraViewWeb/ContentFetcher?commentPara...
Affirmative with Comment

Makins, Jr., Carl

agree with committee statement
Second Revision No. 14-NFPA 472-2016 [ Chapter 19 [Title Only] ]

Competencies for Hazardous Materials Technicians with an Air Advanced Monitoring and Detection Specialty

Submitter Information Verification

Submitter Full Name: Thomas McGowan
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Tue Sep 27 22:28:31 EDT 2016

Committee Statement

Committee Statement: Clarifying chapter title.
Response Message:

Ballot Results

✅ This item has passed ballot

32 Eligible Voters
0 Not Returned
30 Affirmative All
  2 Affirmative with Comments
0 Negative with Comments
0 Abstention

Affirmative All
Baxter, Christina M.
Bevelacqua, Armando S.
Carr, H. K.
Carrasco, Jorge A.
Clawson, Tom
Coffey, William R.
Collins, K. Wade
D’Onofrio, Cris
Edinger, Richard C.
Haberkorn, Clay
Hergenreter, Steven
Ingram, Robert J.
Affirmative with Comment

Emery, Richard B.

Is the word "Advanced" defined anywhere in the standard?

Makins, Jr., Carl

agree with committee statement
When responding to hazardous materials/WMD incidents, the technician level responder assigned to perform advanced air monitoring and detection shall be able to perform the following tasks:

1. Plan the air monitoring and sampling detection activities within the capabilities and competencies of available personnel, PPE, and response equipment.

2. Describe the air monitoring and sampling detection options available to the technician level responder in accordance with the emergency response plan or standard operating procedures.

3. Implement the air monitoring and sampling detection activities as specified in the IAP.

Submitter Information Verification

Submitter Full Name: Thomas McGowan
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Tue Sep 27 22:32:44 EDT 2016

Committee Statement

Committee Statement: consistency within the document
Response Message:

Ballot Results

✔ This item has passed ballot

32 Eligible Voters
0 Not Returned
31 Affirmative All
1 Affirmative with Comments
0 Negative with Comments
0 Abstention

Affirmative All
Baxter, Christina M.
Bevelacqua, Armando S.
Carr, H. K.
Carrasco, Jorge A.
Clawson, Tom
Coffey, William R.
| Collins, K. Wade               |
| D'Onofrio, Cris              |
| Edinger, Richard C.          |
| Emery, Richard B.            |
| Haberkorn, Clay              |
| Hergenreter, Steven          |
| Ingram, Robert J.            |
| Kreutzer, Kristina           |
| Lilley, Troy                 |
| McNett, Wayne                |
| Miller, Ryan K.              |
| Miller, Leslie A.            |
| Miller, Thomas D.            |
| Minson, Matthew              |
| Noll, Gregory G.             |
| Porter, John F.              |
| Preston, Lawrence L.         |
| Rehak, Timothy R.            |
| Royall, Jr., Robert W.       |
| Schnepf, Rob                 |
| Simpson, Danny G.            |
| Terryn, Fred C.              |
| Tracy, Christopher           |
| Uzeloc, Kenneth W.           |
| Wright, Charles J.           |

**Affirmative with Comment**

Makins, Jr., Carl

agree with committee statement
19.3.1
Given the air monitoring and sampling detection equipment provided by the AHJ, the technician level responder assigned to perform air monitoring and detection shall select the detection or monitoring equipment suitable for detecting or monitoring solid, liquid, or gaseous hazardous materials/WMD.

19.3.2
Given the air monitoring and sampling detection equipment provided by the AHJ, the technician level responder assigned to perform air monitoring and detection shall survey the hazardous materials/WMD incident to presumptively identify or classify unknown materials, and to verify the presence and concentrations of hazardous materials.
Affirmative with Comment

Emery, Richard B.

In SR-26 (19.3.5) we state "The TC believes the technician shouldn't "presumptively" identify or classify at this level." Is there a reason why "presumptive" is valid here?

Makins, Jr., Carl

agree with committee statement
Given at least three unknown hazardous materials/WMD, one of which is a solid, one a liquid, and one a gas, the hazardous materials technician shall presumptively identify or classify by hazard each unknown material.

The hazardous materials technician shall presumptively identify the steps in an analysis process for identifying unknown solid and liquid materials.

Submitter Information Verification

Submitter Full Name: Thomas McGowan
Organization: National Fire Protection Assoc
Street Address: 
City: 
State: 
Zip: 
Submittal Date: Sun Oct 23 06:39:09 EDT 2016

Committee Statement

Committee Statement: The TC believes the technician shouldn't "presumptively" identify or classify at this level.
Response Message:

Ballot Results

✔ This item has passed ballot

32 Eligible Voters
0 Not Returned
31 Affirmative All
1 Affirmative with Comments
0 Negative with Comments
0 Abstention

Affirmative All
Baxter, Christina M.
Bevelacqua, Armando S.
Carr, H. K.
Carrasco, Jorge A.
Clawson, Tom
Coffey, William R.
Collins, K. Wade
D’Onofrio, Cris  
Edinger, Richard C.  
Emery, Richard B.  
Haberkorn, Clay  
Hergenreter, Steven  
Ingram, Robert J.  
Kreutzer, Kristina  
Lilley, Troy  
McNett, Wayne  
Miller, Ryan K.  
Miller, Leslie A.  
Miller, Thomas D.  
Minson, Matthew  
Noll, Gregory G.  
Porter, John F.  
Preston, Lawrence L.  
Rehak, Timothy R.  
Royall, Jr., Robert W.  
Schnepp, Rob  
Simpson, Danny G.  
Terryn, Fred C.  
Tracy, Christopher  
Uzeloc, Kenneth W.  
Wright, Charles J.

Affirmative with Comment  
Makins, Jr., Carl  
agree with committee statement
23.2.3
Given examples of radioactive material and radiation exposure devices, the technician level responder assigned to respond to WMD incidents shall describe the potential for illicit use, physical properties, and potential health effects for each of the following: from each.

- Alpha particle
- Beta particle
- Gamma ray
- Neutrons

Submitter Information Verification

Submitter Full Name: Thomas McGowan
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Tue Sep 27 22:36:32 EDT 2016

Committee Statement

Committee Statement: The competency as written cannot be met. There is no logical way for a person to be able to describe how an alpha particle, beta particle, gamma ray or neutron can be used "illicitly." For a Technician with a WMD Specialist, understanding how radioactive materials and radiation exposure devices can be used illicitly, and the potential harm caused by their illicit use, is the competency that should be met.

Response Message:

Public Comment No. 18-NFPA 472-2016 [Section No. 23.2.3]

Ballot Results

- This item has passed ballot
- 32 Eligible Voters
  - 0 Not Returned
  - 31 Affirmative All
    - 1 Affirmative with Comments
    - 0 Negative with Comments
    - 0 Abstention

Affirmative All

Baxter, Christina M.
Bevelacqua, Armando S.
Carr, H. K.
Carrasco, Jorge A.
Clawson, Tom
Coffey, William R.
Collins, K. Wade
D'Onofrio, Cris
Edinger, Richard C.
Emery, Richard B.
Haberkorn, Clay
Hergenreter, Steven
Ingram, Robert J.
Kreutzer, Kristina
Lilley, Troy
McNett, Wayne
Miller, Ryan K.
Miller, Leslie A.
Miller, Thomas D.
Minson, Matthew
Noll, Gregory G.
Porter, John F.
Preston, Lawrence L.
Rehak, Timothy R.
Royall, Jr., Robert W.
Schnepf, Rob
Simpson, Danny G.
Terryn, Fred C.
Tracy, Christopher
Uzeloc, Kenneth W.
Wright, Charles J.

**Affirmative with Comment**

Makins, Jr., Carl
agree with committee statement
24.3.1

Given an incident involving hazardous materials/WMD, the technician level responder assigned to perform advanced decontamination shall describe the following types of advanced decontamination procedures as used by the AHJ:

(1) Advanced decontamination solutions
(2) Dry decontamination
   - **Dry radiological particulate decontamination**
(3) Remote location (limited water) decontamination
(4) Tactical (law enforcement) decontamination
(5) Canine (law enforcement and search) decontamination
(6) Equine (law enforcement) decontamination
(7) Decontamination of collected sample packaging

**Submitter Information Verification**

**Submitter Full Name:** Thomas McGowan  
**Organization:** National Fire Protection Assoc
**Street Address:**  
**City:**  
**State:**  
**Zip:**  
**Submittal Date:** Tue Sep 27 22:37:40 EDT 2016

**Committee Statement**

**Committee Statement:** The term 'radiological particulate' is an erroneous term that has been proactively removed from this and other NFPA standards. It has led to the mistaken belief and interpretation that people are contaminated with alpha and beta particles, which is in impossibility. You can only be contaminated with radioactive material that emits alpha, beta, gamma, and a few other types of radiation. The term as used here would imply that there is some type of advanced form of dry decontamination method that could be employed to remove alpha and beta particles - and there is NO SUCH THING. As far as dry decontamination methods for radioactive material, the only practical ones I am aware of are Scotch, masking, or duct tape - and that is by no means an advanced technology requiring a separate section within this standard.

**Response Message:**

Public Comment No. 16-NFPA 472-2016 [Section No. 24.3.1]

**Ballot Results**

- **This item has passed ballot**
  - 32 Eligible Voters
  - 0 Not Returned
30 Affirmative All
2 Affirmative with Comments
0 Negative with Comments
0 Abstention

Affirmative All
Baxter, Christina M.
Bevelacqua, Armando S.
Carr, H. K.
Carrasco, Jorge A.
Clawson, Tom
Coffey, William R.
Collins, K. Wade
D’Onofrio, Cris
Edinger, Richard C.
Haberkorn, Clay
Hergenreter, Steven
Ingram, Robert J.
Kreutzer, Kristina
Lilley, Troy
McNett, Wayne
Miller, Ryan K.
Miller, Leslie A.
Miller, Thomas D.
Minson, Matthew
Noll, Gregory G.
Porter, John F.
Preston, Lawrence L.
Rehak, Timothy R.
Royall, Jr., Robert W.
Schnepf, Rob
Simpson, Danny G.
Terry, Fred C.
Tracy, Christopher
Uzeloc, Kenneth W.
Wright, Charles J.

Affirmative with Comment
Emery, Richard B.
Could equine be considered "search" as well as canine?
Makins, Jr., Carl
agree with committee statement
Second Revision No. 19-NFPA 472-2016 [ Section No. H.1.2.2 ]

H.1.2.2 API Publications.
American Petroleum Institute, 1220 L Street, N.W., Washington, DC 20005-4070.

Submitter Information Verification

Submitter Full Name: Thomas McGowan
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Tue Oct 04 13:37:22 EDT 2016

Committee Statement

Committee Statement: updating dates
Response Message:

Ballot Results

✔ This item has passed ballot

32 Eligible Voters
  0 Not Returned
  31 Affirmative All
    1 Affirmative with Comments
    0 Negative with Comments
    0 Abstention

Affirmative All
Baxter, Christina M.
Bevelacqua, Armando S.
Carr, H. K.
Carrasco, Jorge A.
Clawson, Tom
Coffey, William R.
Collins, K. Wade
D'Onofrio, Cris
Edinger, Richard C.
Emery, Richard B.
Haberkorn, Clay
Hergenreter, Steven
Ingram, Robert J.
Kreutzer, Kristina
Lilley, Troy
McNutt, Wayne
Miller, Ryan K.
Miller, Leslie A.
Miller, Thomas D.
Minson, Matthew
Noll, Gregory G.
Porter, John F.
Preston, Lawrence L.
Rehak, Timothy R.
Royall, Jr., Robert W.
Schnepf, Rob
Simpson, Danny G.
Terryn, Fred C.
Tracy, Christopher
Uzeloc, Kenneth W.
Wright, Charles J.

Affirmative with Comment
Makins, Jr., Carl
agree with committee statement
H.1.2.3 ASTM Publications.
ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959.

Submitter Information Verification
Submitter Full Name: Thomas McGowan
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Tue Oct 04 13:38:12 EDT 2016

Committee Statement
Committee Statement: updating dates
Response Message:

Ballot Results

✔ This item has passed ballot

32 Eligible Voters
0 Not Returned
31 Affirmative All
1 Affirmative with Comments
0 Negative with Comments
0 Abstention

Affirmative All
Baxter, Christina M.
Bevelacqua, Armando S.
Carr, H. K.
Carrasco, Jorge A.
Clawson, Tom
Coffey, William R.
Collins, K. Wade
D’Onofrio, Cris
Edinger, Richard C.
Emery, Richard B.
Haberkorn, Clay
Hergenreter, Steven
Ingram, Robert J.
Kreutzer, Kristina
Lilley, Troy
McNutt, Wayne
Miller, Ryan K.
Miller, Leslie A.
Miller, Thomas D.
Minson, Matthew
Noll, Gregory G.
Porter, John F.
Preston, Lawrence L.
Rehak, Timothy R.
Royall, Jr., Robert W.
Schnepp, Rob
Simpson, Danny G.
Terryn, Fred C.
Tracy, Christopher
Uzeloc, Kenneth W.
Wright, Charles J.

**Affirmative with Comment**

Makins, Jr., Carl
agree with committee statement