Second Revision No. 130-NFPA 2500-2020 [Section No. 4.2.5]

4.2.5

It is not the intent of this document ~~to have~~ that an organization shall deem itself capable of an advanced skill level in any of the disciplines defined herein simply by training or adhering to the requirements set forth.

4.2.6*

Maintaining an operations- or technician-level capability in any discipline shall require a combination of study, training, skill, and frequency of operations in that discipline.

Submitter Information Verification

Committee: TEC-AAA

Submittal Date: Tue Nov 10 15:25:59 EST 2020

Committee Statement

Committee Statement: These changes were made in order to comply with the MOS, one requirement per statement, and to also ensure the related annex material is aligned with the correct section of text by moving the annex material from the current 4.2.5 to what will be the new 4.2.6.

Response Message: SR-130-NFPA 2500-2020

Second Revision No. 161-NFPA 2500-2020 [Section No. 4.2.14]

4.2.15*

The AHJ shall train responsible personnel in procedures for invoking, accessing, and using relevant components of the *National Search and Rescue Plan of the United States*, the "FEMA National Response Framework," and other national, state, and local response plans, as applicable.

A.4.2.15

Personnel involved in search and rescue (SAR) in the United States, and in other countries that have adopted its use, should also familiarize themselves with the *International Aeronautical and Maritime Search and Rescue (IAMSAR) Manual* and the ~~*U.S.*~~ *United States National Search and Rescue Supplement* (NSS) *to the IAMSAR* (soon to be renamed the *National SAR Manual*).

The *IAMSAR Manual* is a three-volume set of reference materials jointly published by the International Civil Aviation Organization (ICAO) and the International Maritime Organization (IMO). It was intended for use by all countries and provides implementation guidance for the ~~*U.S*~~ *. National Search and Rescue Plan for the United States* (2007).

The NSS, prepared under the direction of the National Search and Rescue Committee (NSARC), provides guidance to federal agencies concerning implementation of the National Search and Rescue Plan. The NSS provides specific additional national standards and guidance that build upon the baseline established in the *IAMSAR Manual* and provides guidance to all federal forces, military and civilian, that support civil search and rescue operations.

Submitter Information Verification

Committee: TEC-AAA

Submittal Date: Mon Nov 23 10:50:40 EST 2020

Committee Statement

Committee Statement: These changes were editorial in nature and to align with chapter 2 and Annex L.

Response Message: SR-161-NFPA 2500-2020

Second Revision No. 143-NFPA 2500-2020 [Section No. 7.2.2]

7.2.2

The organization shall have an appropriate number of personnel meeting the requirements of Chapter 4 of ~~NFPA 472~~ NFPA 470 commensurate with the organization's needs.

Submitter Information Verification

Committee: TEC-AAA

Submittal Date: Fri Nov 13 10:21:58 EST 2020

Committee Statement

Committee Statement: This change was made in order to reflect the consolidation of NFPA 472 into NFPA 470 as part of the consolidation plan.

Response Message: SR-143-NFPA 2500-2020

Second Revision No. 144-NFPA 2500-2020 [Section No. 8.2.2]

8.2.2

All members of the organization shall meet the requirements specified in Chapter 4 of ~~NFPA 472~~ NFPA 470 commensurate with the organization's needs.

Submitter Information Verification

Committee: TEC-AAA

Submittal Date: Fri Nov 13 10:26:19 EST 2020

Committee Statement

Committee Statement: This change was made in order to reflect the consolidation of NFPA 472 into NFPA 470 as part of the consolidation plan.

Response Message: SR-144-NFPA 2500-2020

Second Revision No. 145-NFPA 2500-2020 [Section No. 8.3.2]

8.3.2

All members of the organization shall meet the requirements of ~~Chapter 5~~ Chapter 6 of ~~NFPA 472~~ NFPA 470 commensurate with the organization's needs.

Submitter Information Verification

Committee: TEC-AAA

Submittal Date: Fri Nov 13 10:26:45 EST 2020

Committee Statement

Committee Statement: This change was made in order to reflect the consolidation of NFPA 472 into NFPA 470 as part of the consolidation plan.

Response Message: SR-145-NFPA 2500-2020

Second Revision No. 124-NFPA 2500-2020 [Section No. 9.4.5]

9.4.5

Organizations operating at the technician level for animal rescue incidents shall develop and implement procedures, commensurate with the identified needs of the organization, for the following:

(1) Using a tested harness device designed for animals and extended use in the high-angle environment ~~to include helicopter rescue~~

(2) Performing a high-angle rescue of an animal stranded on a structure or landscape feature

(3)* Negotiating an obstacle or projection along a horizontal path with an animal packaged in a litter or sling system

(4) Applying the principles of the physics involved in constructing rope rescue systems, including system safety factors, critical angles, and the causes and effects of force multipliers

(5)* Using high-angle rescue techniques to negotiate obstacles or otherwise manipulate the position of an animal packaged in an animal litter or sling system

(6) Moving an animal packaged in a litter or sling system up and over an edge during a raising or vertical lift operation with a rope system

(7) Mitigating dynamic loads associated with animal behaviors in a rope rescue system

Submitter Information Verification

Committee: TEC-AAA

Submittal Date: Mon Nov 09 10:32:01 EST 2020

Committee Statement

Committee Statement: Mention of helicopters has been stricken elsewhere in animal technical rescue standards, and the verbiage is not necessary to maintain the integrity of this point.

Response Message: SR-124-NFPA 2500-2020

Public Comment No. 2-NFPA 2500-2020 [Section No. 9.4.5]

Second Revision No. 146-NFPA 2500-2020 [Section No. 11.2.2]

11.2.2

Each member of the organization shall meet the requirements specified in Chapter 4 of ~~NFPA 472~~ NFPA 470 and shall be a competent person as defined in 3.3.34.

Submitter Information Verification

Committee: TEC-AAA

Submittal Date: Fri Nov 13 10:36:24 EST 2020

Committee Statement

Committee Statement: This change was made in order to reflect the consolidation of NFPA 472 into NFPA 470 as part of the consolidation plan.

Response Message: SR-146-NFPA 2500-2020

Second Revision No. 152-NFPA 2500-2020 [Section No. 11.2.3]

11.2.3

Organizations operating at the awareness level at trench and excavation emergencies shall implement procedures for the following:

(1) Initiating size-up to ascertain immediate response needs for a trench rescue

(2) Recognizing the need for technical resources

(3)* Identifying the resources necessary to conduct safe and effective trench and excavation emergency operations

(4)* Initiating the emergency response system for trenches and excavations

(5)* Initiating site control and scene management

(6)* Recognizing general hazards associated with trench and excavation emergency incidents and the procedures necessary to mitigate these hazards within the general rescue area

(7)* Recognizing typical trench and excavation collapse patterns, the reasons trenches and excavations collapse, and the potential for secondary collapse

(8)* Initiating a rapid, nonentry extrication of noninjured or minimally injured victim(s)

(9)* Recognizing the unique hazards associated with the weight of soil and its associated entrapping characteristics

(10) Implementing a hazard identification and isolation plan, including securing hazardous equipment, contacting utility location services, establishing control of affected utilities, and using methods for protecting bystanders and rescuers from accidentally falling into the excavation or increasing the likelihood of additional collapse

(11)* Identifying and implementing methods for approaching and working around the excavation in a manner that minimizes the potential of collapse resulting from additional imposed loads on the lip of the trench

A.11.2.3(11)

The primary method of risk management at this level is always to reduce the number of responders who approach the trench to only those necessary to perform the required tasks of assessing conditions in the excavation, locating a potential victim, and making any provisions to support immediate self-rescue or nonentry rescue. Other methods could include a path of approach that minimizes additional imposed load, which is typically from the end of the trench, and the use of load distribution and transfer techniques. Load transfer and distribution techniques might include the use of bridging, which uses ground ladders or lumber laid on the ground across the trench or along the edge to distribute the weight of responders and equipment across as wide an area and as far back from the lip as possible.

(12) Supporting an organization at the operations or technician level while functioning within an IMS

Submitter Information Verification

Committee: TEC-AAA

Submittal Date: Mon Nov 16 12:31:37 EST 2020

Committee Statement

Committee Statement:	The committee is adding this new text as the current language provides for the completions of a task without guidance on how it might be accomplished. This annex material assists the reader with the intent on how it might be done.
Response Message:	SR-152-NFPA 2500-2020

Public Comment No. 112-NFPA 2500-2020 [Section No. 11.2.3]

Second Revision No. 147-NFPA 2500-2020 [Section No. 11.3.2]

11.3.2

Each member of the organization shall meet the requirements specified in Chapter 4 of ~~NFPA 472~~ NFPA 470 .

Submitter Information Verification

Committee: TEC-AAA

Submittal Date: Fri Nov 13 10:36:53 EST 2020

Committee Statement

Committee Statement: This change was made in order to reflect the consolidation of NFPA 472 into NFPA 470 as part of the consolidation plan.

Response Message: SR-147-NFPA 2500-2020

Second Revision No. 148-NFPA 2500-2020 [Section No. 12.2.2]

12.2.2

All members of the organization shall meet the requirements specified in Chapter 4 of ~~NFPA 472~~ 470 commensurate with the organization's needs.

Submitter Information Verification

Committee: TEC-AAA

Submittal Date: Fri Nov 13 10:37:24 EST 2020

Committee Statement

Committee Statement: This change was made in order to reflect the consolidation of NFPA 472 into NFPA 470 as part of the consolidation plan.

Response Message: SR-148-NFPA 2500-2020

Second Revision No. 149-NFPA 2500-2020 [Section No. 12.3.2]

12.3.2

All members of the organization shall meet the requirements of Chapter ~~5~~ 6 of ~~NFPA 472~~ NFPA 470 commensurate with the organization's needs.

Submitter Information Verification

Committee: TEC-AAA

Submittal Date: Fri Nov 13 10:37:49 EST 2020

Committee Statement

Committee Statement: This change was made in order to reflect the consolidation of NFPA 472 into NFPA 470 as part of the consolidation plan.

Response Message: SR-149-NFPA 2500-2020

Second Revision No. 150-NFPA 2500-2020 [Section No. 12.4.2]

12.4.2

All members of the organization shall meet the requirements of Chapter ~~5~~ 6 of ~~NFPA 472~~ NFPA 470 commensurate with the organization's needs.

Submitter Information Verification

Committee: TEC-AAA

Submittal Date: Fri Nov 13 10:38:19 EST 2020

Committee Statement

Committee Statement: This change was made in order to reflect the consolidation of NFPA 472 into NFPA 470 as part of the consolidation plan.

Response Message: SR-150-NFPA 2500-2020

Second Revision No. 125-NFPA 2500-2020 [Section No. 13.2.4]

~~13.2.4~~

~~Each member of the cave rescue organization at the awareness level shall train to a minimum of Orientation to Cave Rescue as defined by the National Cave Rescue Commission of the National Speleological Society or equivalent.~~

Submitter Information Verification

Committee: TEC-AAA

Submittal Date: Mon Nov 09 10:47:56 EST 2020

Committee Statement

Committee Statement: As this is an organizational standard, 13.2.4 should not discuss what each member should be trained to. As such, it should be struck from the requirements. If this line is to remain, however, it should not reference a 3rd party's standard or equivalent without explicitly listing the requirements in the standard. All the other rescue disciplines list what is required in their standard and make the training requirements clear. As written, this line allows the 3rd party to change standards any time they wish without review.

Response Message: SR-125-NFPA 2500-2020

Public Comment No. 113-NFPA 2500-2020 [Section No. 13.2.4]

Second Revision No. 126-NFPA 2500-2020 [Section No. 13.3.4]

~~13.3.4~~

~~Each member of the cave rescue organization at the operational level shall train to a minimum of Level 2 Cave Rescuer as defined by the National Cave Rescue Commission of the National Speleological Society or equivalent.~~

Submitter Information Verification

Committee: TEC-AAA

Submittal Date: Mon Nov 09 10:51:51 EST 2020

Committee Statement

Committee Statement: As this is an organizational standard, 13.3.4 should not discuss what each member should be trained to. As such, it should be struck from the requirements. If this line is to remain, however, it should not reference a 3rd party's standard or equivalent without explicitly listing the requirements in the standard. All the other rescue disciplines list what is required in their standard and make the training requirements clear. As written, this line allows the 3rd party to change standards any time they wish without review.

Response Message: SR-126-NFPA 2500-2020

Public Comment No. 114-NFPA 2500-2020 [Section No. 13.3.4]

Second Revision No. 131-NFPA 2500-2020 [Section No. 13.4.2]

13.4.2

Organizations operating at the technician level at cave search and rescue incidents shall be capable of operating in environments in which special cave search and rescue training and equipment are required or where the capabilities of operations-level equipment and training are exceeded.

13.4.3

Technician-level response capability shall be required where any of the following are true:

(1) Where cave passage involves difficult scrambling or climbing

(2) Where water obstacles deeper than 2 ft (0.61 m) are present

(3) Where search and/or rescue involves technical cave passage that is difficult to negotiate without special skills or that might be exposed or dangerous

(4) Where cave passage is tight and might require squeezing through constricted spaces

(5) Where travel or transport might involve fragile cave environments

(6) Where the incident might span more than one operational period of 8 hours

(7) Where specialized route-finding skills are required, or the use of cave maps is required

(8) Where travel or patient evacuation requires negotiating steep to vertical slopes where rope is essential for security or suspension

Submitter Information Verification

Committee: TEC-AAA

Submittal Date: Tue Nov 10 15:27:10 EST 2020

Committee Statement

Committee Statement: This change is being made in order to comply with the MOS, one requirement/sentence per section, and is being broken out into two sections. There are no changes being made to the text or the individual requirements.

Response Message: SR-131-NFPA 2500-2020

Second Revision No. 127-NFPA 2500-2020 [Section No. 13.4.6]

~~13.4.7~~

~~Each member of the cave rescue organization at the technical level shall train to a minimum of Level 3 Cave Rescuer as defined by the National Cave Rescue Commission of the National Speleological Society or equivalent.~~

Submitter Information Verification

Committee: TEC-AAA

Submittal Date: Mon Nov 09 10:54:08 EST 2020

Committee Statement

Committee Statement: As this is an organizational standard, 13.4.6 should not discuss what each member should be trained to. As such, it should be struck from the requirements. If this line is to remain, however, it should not reference a 3rd party's standard or equivalent without explicitly listing the requirements in the standard. All the other rescue disciplines list what is required in their standard and make the training requirements clear. As written, this line allows the 3rd party to change standards any time they wish without review.

Response Message: SR-127-NFPA 2500-2020

Public Comment No. 115-NFPA 2500-2020 [Section No. 13.4.6]

Second Revision No. 151-NFPA 2500-2020 [Section No. 14.2.2]

14.2.2

All members of the organization shall meet the requirements of Chapter 4 of ~~NFPA 472~~ NFPA 470 commensurate with the organization's needs.

Submitter Information Verification

Committee: TEC-AAA

Submittal Date: Fri Nov 13 10:39:03 EST 2020

Committee Statement

Committee Statement: This change was made in order to reflect the consolidation of NFPA 472 into NFPA 470 as part of the consolidation plan.

Response Message: SR-151-NFPA 2500-2020

Second Revision No. 128-NFPA 2500-2020 [Section No. 17.4.3]

17.4.3

Organizations operating at the technician level at swiftwater search and rescue incidents shall have the following capabilities:

(1) Constructing and operating rope rescue system anchors and mechanical advantage systems as specified by the AHJ

(2) Constructing a tension diagonal rope system over water

(3) Constructing a highline system over water

(4) Constructing and operating rope systems that position and move a tethered boat controlled by ropes

Submitter Information Verification

Committee: TEC-AAA

Submittal Date: Mon Nov 09 10:55:52 EST 2020

Committee Statement

Committee Statement: Consistency of writing, unless we are thinking that teams will be building tension diagonals over dry land. . .

Response Message: SR-128-NFPA 2500-2020

Public Comment No. 111-NFPA 2500-2020 [Section No. 17.4.3]

Second Revision No. 132-NFPA 2500-2020 [Section No. 23.2.3 [Excluding any Sub-Sections]]

The AHJ shall ensure that each member of the tower rescue organization is aware of the hazards that could be confronted when called upon to perform rescue in or on towers within the response area of the AHJ, including (but not limited to) radio frequency RF.

Submitter Information Verification

Committee: TEC-AAA

Submittal Date: Tue Nov 10 15:28:13 EST 2020

Committee Statement

Committee Statement: This change was editorial in nature as this is the first occurrence where RF is used or called out, so it should be spelled out.

Response Message: SR-132-NFPA 2500-2020

Second Revision No. 154-NFPA 2500-2020 [Section No. A.4.5.1.1]

A.4.5.1.1

Specific specialized equipment that might be required for safe technical rescue operations includes the following:

(1) Supplied line breathing apparatus (SLBA), supplied air breathing apparatus (SABA), and supplied air respirator (SAR), all of which should meet the requirements of 29 CFR 1910.146, “Permit-Required Confined Spaces”

(2) Personal alert safety system (PASS), which should meet the requirements of NFPA 1500 and NFPA 1982

(3) Life safety ropes and system components, which should meet the requirements of NFPA 1500~~,~~ and the applicable requirements of ~~NFPA 1983~~ NFPA 2500

(4) Communications equipment, which should meet the requirements of 29 CFR 1910.146

(5) Lighting equipment (e.g., flashlights, helmet-mounted lamps), which should be, depending on the situation, intrinsically safe or explosion proof as defined by 29 CFR 1910.146, and should be evaluated by the AHJ as to the appropriateness of the equipment at an emergency incident with regard to the existing hazards

Submitter Information Verification

Committee: TEC-AAA

Submittal Date: Mon Nov 23 10:17:02 EST 2020

Committee Statement

Committee Statement: This change was made due to the ERRS consolidation plan and to update the cross-reference of NFPA 1983 as that document has been consolidated into this document, NFPA 2500.

Response Message: SR-154-NFPA 2500-2020

Second Revision No. 155-NFPA 2500-2020 [Section No. A.7.2.4(3)]

A.7.2.4(3)

Hazards can include, but are not limited to, the following:

(1) Hazardous atmospheres

(2) Hazardous chemicals

(3) Temperature extremes

Some methods of recognition and assessment of hazards associated with confined spaces include, but are not limited to, the following:

(1) Assessment of the perimeter surrounding the confined space incident to determine the presence of or potential for a hazardous condition that could pose a risk to rescuers during approach

(2) Recognition of the need for decontamination of a patient or responder who might have been exposed to a hazardous material as per ~~NFPA 472~~ , ~~NFPA 473~~ , NFPA 470 and OSHA regulations in 29 CFR 1910.120, “Hazardous Waste Operations and Emergency Response” (HAZWOPER)

(3) Recognition of the need for a confined space rescue service or additional resources when nonentry retrieval is not possible

(4) Notification of the designated rescue service and other resources necessary for initiation of confined space rescue

(5) Recognition of hazardous atmospheres or materials through visual assessment and information received from on-site personnel

Submitter Information Verification

Committee: TEC-AAA

Submittal Date: Mon Nov 23 10:20:21 EST 2020

Committee Statement

Committee Statement: This change was made due to the ERRS consolidation plan and to update the cross-reference from NFPA 472 and NFPA 473 to NFPA 470 as NFPA 472 and NFPA 473 are now consolidated into NFPA 470.

Response Message: SR-155-NFPA 2500-2020

Second Revision No. 156-NFPA 2500-2020 [Section No. A.7.3.7(5)]

A.7.3.7(5)

Personnel meeting the requirements of ~~NFPA 472~~ NFPA 470 should perform the monitoring procedures even if such personnel are not part of the rescue team. Monitoring the atmosphere can include the following considerations:

(1) Acceptable limits for oxygen concentration in air should be between 19.5 percent and 23.5 percent. An oxygen-enriched atmosphere is considered to be greater than 23.5 percent and poses a flammability hazard. An oxygen-deficient atmosphere is considered to be lower than 19.5 percent and can lead to asphyxiation without fresh-air breathing apparatus.

(2) Flammability is measured as a percentage of a material's lower explosive limit (LEL) or lower flammable limit (LFL). Rescuers should not enter confined spaces containing atmospheres greater than 10 percent of a material's LEL regardless of the PPE worn. There is no adequate protection for an explosion within a confined space.

(3) Acceptable toxicity levels are specific to the hazardous material involved, and chemical properties should be assessed to determine the level of the hazard for a given environment and time frame.

The confined space rescue team at the operations level should have available resources capable of understanding the assessment tools necessary for analysis and identification of hazardous conditions within confined spaces and interpretation of that data. This capability should include at least the following:

(1) Identification of the hazards found within confined spaces and understanding how those hazards influence victim viability and rescue/recovery operations

(2) Selection and use of monitoring equipment to assess the following hazards:

  (a) Oxygen-deficient atmospheres

  (b) Oxygen-enriched atmospheres

  (c) Flammable environments

  (d) Toxic exposures

  (e) Radioactive exposures

  (f) Corrosive exposures

(3) Understanding of the limiting factors associated with the selection and use of the atmospheric and chemical monitoring equipment provided by the AHJ for confined space emergencies. The factors determined by this equipment include, but are not limited to, calibration, proper operation, response time, detection range, relative response, sensitivity, selectivity, inherent safety, environmental conditions, and the nature of the hazard. This equipment could include, but is not limited to, the following:

  (a) Calorimetric tubes

  (b) Oxygen concentration monitor (continuous reading, remote sampling)

  (c) Combustible gas monitor (continuous reading, remote sampling)

  (d) Specific toxicity monitor (continuous reading, remote sampling)

  (e) Multigas atmospheric monitors (continuous reading, remote sampling)

  (f) Passive dosimeter

  (g) pH papers, pH meters, and pH strips

  (h) Radiation detection instruments

(4) Utilization and evaluation of reference terms and resources to include, but not be limited to, the following:

  (a) Lethal concentration-50 (LC-50)

  (b) Lethal dose-50 (LD-50)

(c) Permissible exposure limit (PEL)
(d) Threshold limit value (TLV)
(e) Threshold limit value — short-term exposure limit (TLV-STEL)
(f) Threshold limit value — time-weighted average (TLV-TWA)
(g) Immediately dangerous to life and health (IDLH)
(h) Chemical information documents (i.e., SDS)
(i) Reference manuals
(j) Computerized reference databases
(k) Technical information centers
(l) Technical information specialists
(m) Monitoring equipment

Submitter Information Verification

Committee: TEC-AAA
Submittal Date: Mon Nov 23 10:22:49 EST 2020

Committee Statement

Committee Statement: This change was made due to the ERRS consolidation plan and to update the cross-reference from NFPA 472 to NFPA 470 as NFPA 472 is now consolidated into NFPA 470.
Response Message: SR-156-NFPA 2500-2020

Second Revision No. 162-NFPA 2500-2020 [Section No. A.10.4.2]

A.10.4.2

See *Mountain Rescue Association Policies,* "Policy ~~150~~ 105 : Personnel Guidelines."

Submitter Information Verification

Committee: TEC-AAA
Submittal Date: Mon Nov 23 10:54:32 EST 2020

Committee Statement

Committee Statement: This change was to update to the correct title.
Response Message: SR-162-NFPA 2500-2020

Second Revision No. 157-NFPA 2500-2020 [Section No. A.11.3.4(20)]

A.11.3.4(20)

Procedures for disentanglement and removing the entrapment mechanism can include, but are not limited to, the following:

(1) Hand digging

(2) Lifting using air bags, pneumatic, or other mechanical advantage devices

(3) Suctioning

(4) Cutting using air knives, saws, or other power tools

(5) Dewatering

(6) Use of heavy equipment

Procedures and equipment involved in removal systems should comply with ~~NFPA 1983~~ the applicable portions of this standard .

Heavy or mechanical equipment and/or mechanical winches of any kind should not be used to physically lift, pull, or extricate victims from a trench. However, there can be circumstances when heavy equipment can be appropriate for accessing victims of trench and evacuation emergencies with the appropriate level of supervision and after careful consideration is given to the negative impact of such actions on the victim, including the effects of extreme superimposed loads and vibration adjacent to the trench. For example, heavy equipment might be used to dig an adjacent trench or hole for access, but the excessive loading and vibration of the area adjacent to the trench can cause a rapid deterioration in the condition of, and in the immediate environment surrounding, the victim. In any case, to best establish viable options and available capabilities, the advice of experienced and knowledgeable on-site personnel should be sought in order to make the best possible decisions.

Submitter Information Verification

Committee: TEC-AAA

Submittal Date: Mon Nov 23 10:25:01 EST 2020

Committee Statement

Committee Statement: This change was made due to the ERRS consolidation plan and to update the cross-reference from NFPA 1983 to this standard (NFPA 2500) as NFPA 1983 is now consolidated into this standard (NFPA 2500).

Response Message: SR-157-NFPA 2500-2020

Second Revision No. 158-NFPA 2500-2020 [Section No. A.11.4.3(10)]

A.11.4.3(10)

Personnel meeting the requirements of ~~NFPA 472~~ NFPA 470 should perform the monitoring procedures even if such personnel are not part of the rescue team. Important information regarding these procedures include, but are not limited to, the following:

(1) Acceptable limits for oxygen concentration in air should be between 19.5 percent and 23.5 percent. An oxygen-enriched atmosphere is considered to be greater than 23.5 percent and poses a flammability hazard. An oxygen-deficient atmosphere is considered to be lower than 19.5 percent and can lead to asphyxiation without fresh-air breathing apparatus.

(2) Flammability is measured as a percentage of a material's lower explosive limit (LEL) or lower flammable limit (LFL). Rescuers should not enter confined spaces containing atmospheres greater than 10 percent of a material's LEL regardless of the PPE worn. There is no adequate protection for an explosion within a confined space.

(3) Acceptable toxicity levels are specific to the hazardous material involved, and chemical properties should be assessed to determine the level of the hazard for a given environment and time frame.

Submitter Information Verification

Committee: TEC-AAA

Submittal Date: Mon Nov 23 10:27:05 EST 2020

Committee Statement

Committee Statement: This change was made due to the ERRS consolidation plan and to update the cross-reference from NFPA 472 to NFPA 470 as NFPA 472 is now consolidated into NFPA 470.

Response Message: SR-158-NFPA 2500-2020

Second Revision No. 159-NFPA 2500-2020 [Section No. A.14.2.3(3)]

A.14.2.3(3)

Hazards can include, but are not limited to, the following:

(1) Hazardous atmospheres

(2) Hazardous chemicals

(3) Temperature extremes

(4) Fall hazards

(5) Moving equipment

Some methods of recognition and assessment of hazards associated with mines and tunnels include, but are not limited to, the following:

(1) Assessment of the perimeter surrounding the mine or tunnel incident to determine the presence of or potential for a hazardous condition that could pose a risk to rescuers during approach

(2) Recognition of the need for decontamination of a patient or responder who might have been exposed to a hazardous material as per Chapter ~~11~~ 18 of ~~NFPA 472~~ NFPA 470 and OSHA regulations in 29 CFR 1910.120, “Hazardous Waste Operations and Emergency Response” (HAZWOPER)

(3) Recognition of the need for a search and rescue organization or additional resources

(4) Notification of the designated search and rescue organization and other resources necessary for initiation of mine or tunnel rescue

(5) Recognition of hazardous atmospheres or materials through visual assessment and information received from on-site personnel

(6) Recognition of potential fall hazards in and around the site

(7) Recognition of potential hazards associated with open excavations in and around the site

Submitter Information Verification

Committee: TEC-AAA

Submittal Date: Mon Nov 23 10:30:48 EST 2020

Committee Statement

Committee Statement: This change was made due to the ERRS consolidation plan and to update the cross-reference from NFPA 472 to NFPA 470 as NFPA 472 is now consolidated into NFPA 470.

Response Message: SR-159-NFPA 2500-2020

Second Revision No. 160-NFPA 2500-2020 [Section No. A.18.4.7(14)]

A.18.4.7(14)

See ~~Chapter 11 of~~ ~~NFPA 472~~ ~~and~~ ~~NFPA 473~~ Chapter 18 of NFPA 470 for pre-entry and postentry monitoring. An abbreviated exam in rescue mode can consist of oral history only (e.g., level of consciousness, recent illness, injury, or medication; recent alcohol ingestion; problems incompatible with equalizing). This exam can be accomplished as the diver is dressing.

Submitter Information Verification

Committee: TEC-AAA

Submittal Date: Mon Nov 23 10:35:21 EST 2020

Committee Statement

Committee Statement: This change was made due to the ERRS consolidation plan and to update the cross-reference to NFPA 470.

Response Message: SR-160-NFPA 2500-2020

Second Revision No. 163-NFPA 2500-2020 [Section No. E.2]

E.2 Four Categories of Building Construction.

The construction categories, types, and occupancy usage of various structures might necessitate the utilization of a variety of different techniques and material. The four construction categories that the rescuer most likely will encounter in collapse situations are light-frame, heavy wall, heavy floor, and precast concrete construction. The following four categories usually comprise the majority of structures affected by a collapse:

(1) *Light-Frame Construction.*

(a) Materials used for light-frame construction are generally lightweight and provide a high degree of structural flexibility in response to forces such as earthquakes, hurricanes, tornados, and so forth.

(b) These structures typically are constructed with skeletal structural frame systems of wood or light-gauge steel components that provide support to the floor and roof assemblies.

(c) Examples of this construction type include wood frame structures used for residential, multiple low-rise, and light commercial occupancies up to four stories in height. Light-gauge steel frame buildings include commercial, business, and light manufacturing occupancies and facilities.

(2) *Heavy Wall Construction.*

(a) Materials used for heavy wall construction are generally heavy and utilize an interdependent structural or monolithic system. These types of materials and their assemblies tend to produce a structural system that is inherently rigid.

(b) This construction type usually is built without a skeletal structural frame. It utilizes a heavy wall support and assembly system that provides support for the floors and roof areas.

(c) Occupancies utilizing tilt-up concrete construction are typically one to three stories in height and consist of multiple, monolithic concrete wall panel assemblies. They also use an interdependent girder, column, and beam system for providing lateral wall support of floor and roof assemblies. Such occupancies typically include commercial, mercantile, and industrial usage. Materials other than concrete now are being utilized in tilt-up construction.

(d) Examples of this type of construction include reinforced and unreinforced masonry buildings typically of low-rise construction, one to six stories in height, and of any occupancy type.

(3) *Heavy Floor Construction.*

(a) Structures of heavy floor construction are built utilizing cast-in-place concrete construction consisting of flat slab panel, waffle, or two-way concrete slab assemblies. Pretensioned or post-tensioned reinforcing steel rebar or cable systems are common components used for structural integrity. The vertical structural supports include integrated concrete columns, concrete-enclosed steel frame, or steel frame, which carry the load of all floor and roof assemblies. This type of structure includes heavy timber construction that might use steel rods for reinforcement.

(b) The reinforcing steel, along with the varying thicknesses of concrete structural slab and girder supports utilized in this construction assembly, pose significant concerns with respect to breaching and void penetration.

(c) The loss of reinforcement capability and the integrity of structural loading capacity of the floor and wall assemblies create significant safety and operational considerations during collapse operations.

(d) Structural steel frame construction utilizes a skeletal framing system consisting of large-load-carrying girders, beams, and columns for structural support. These components represent a substantial weight factor for individual and assembly components. Floor systems consist of cast-in-place concrete slabs of varying thicknesses poured onto metal pan or structural metal floor decks and also might include precast and post-tensioned concrete plank systems. These concrete/metal

pan floor assemblies are supported by the structural steel framing system.

(e) The exterior construction might consist of metal or masonry veneer, curtain wall, or composite material panel systems. Additionally, precast concrete or stoneclad panel systems might be present.

(f) Multiple assembly or component failures might be present in a collapse situation where isolated or multiple collapse conditions or collapse configurations exist.

(g) Examples of this type of construction include offices, schools, apartments, hospitals, parking structures, and multipurpose facilities. Heights vary from single-story to high-rise structures.

(4) *Precast Concrete Construction.*

(a) Structures of precast concrete construction are built utilizing modular precast concrete components that include floors, walls, columns, and other subcomponents that are field-connected at the site.

(b) Individual concrete components utilize imbedded steel reinforcing rods and welded wire mesh for structural integrity and might utilize either steel beam and column or concrete framing systems for the overall structural assembly and building enclosure.

(c) These structures rely on single- or multipoint connections for floor and wall enclosure assembly and are a safety and operational concern during collapse operations.

(d) Examples of this type of construction include commercial, mercantile, office, and multiuse or multifunction structures, including parking structures and large occupancy facilities.

Table E.2 lists the four model construction codes and standards commonly adopted within the United States and is provided to aid the AHJ in identifying the relationship of ~~NFPA 1670~~ NFPA 2500 (Chapters 4 through 23) construction/collapse types to their applicable code. These model codes are referenced to classification Types I through V as specified in NFPA 220.

Table E.2 Fire-Resistive Building Types

Reference	Fire-Resistive[a]		Noncombustible[a]			Ordinary[1a]		Heavy Timber[a]	Wood[a]	
NFPA 220[b,c]	Type I		Type II			Type III		Type IV	Type V	
	443	332	222	111	000	211	200	2HH	111	000
BOCA[d]	Type I		Type II			Type III		Type IV	Type V	
	1A	1B	2A	2B	2C	3A	3B	4	5A	5B
UBC[e]	Type I		Type II			Type III		Type IV	Type V	
	P		P	P	NP	P	NP		P	NP
SBC[f]	Type I	Type II	Type IV			Type V		Type III	Type VI	
	433	332	P	NP	P	NP	2HH	P	NP	

[a]The table headings for fire-resistive, noncombustible, ordinary, heavy timber, and wood construction do not represent any special construction code classification but are meant to provide an easily recognizable general construction type reference.

[b]See NFPA 220 for common definitions of construction Types I through V.

[c]The three-digit arabic numbers that appear beneath each construction type heading designate the fire resistance rating requirements for certain structural elements specified in NFPA 220. They are provided in this table as a reference and to indicate their relationship to each type of construction.

[d]Construction types are referenced to the BOCA *National Building Code* for correlation with fire-resistive rating requirements for each construction type.

[e]Construction types are referenced to UBC, *Uniform Building Code.* The designations P and NP stand for “protected” and “not protected,” respectively, as used within the UBC.

[f]Construction types are referenced to SBC, *Standard Building Code.* The designations P (protected) and NP (not protected) are used in order to provide correlation with *Uniform Building Code* information.

Figure E.2 is intended to identify construction/collapse types according to the classifications of NFPA 220 and is not part of any fire-resistive or fire rating/assembly requirement. In this table, the ~~NFPA 1670~~ NFPA 2500 (Chapters 4 through 23) construction/collapse types are referenced to NFPA 220 to allow rapid correlation of construction code classification with the associated construction/collapse type. Depending on occupancy, usage, and actual size of the structure, some construction code classifications can exhibit characteristics of other than specifically correlated construction/collapse types.

Figure E.2 Construction Code Classifications by Building Type.

Construction/Code Classifications		Fire-Resistive	Noncombustible	Ordinary	Heavy Timber	Wood
NFPA 220 classifications		I	II	III	IV	V
NFPA 2500 Chapters 4 through 23 construction/collapse types	Light frame					
	Heavy wall					
	Heavy floor					
	Precast concrete					

Submitter Information Verification

Committee: TEC-AAA

Submittal Date: Mon Nov 23 11:04:21 EST 2020

Committee Statement

Committee Statement: This change is being made due to the ERRS consolidation project and that NFPA 1670 is now consolidated into NFPA 2500 and to identify what chapters in NFPA 2500 are the content that was NFPA 1670. The change to Figure E.2 is to read as follows:

NFPA 2500 (chapters 4-23) construction/collapse types

Response Message: SR-163-NFPA 2500-2020

Second Revision No. 153-NFPA 2500-2020 [Section No. G.4]

G.4 Confined Space Hazard Identification.

Procedures to perform a confined space hazard identification include, but are not limited to, the following:

(1) Identification of the important industrial documentation, where available, useful in hazard identification, including entry permits, lockout/tagout procedures and checklists, and hot work permits

(2) Selection of all applicable information necessary for emergency responders from chemical information documents (i.e., SDS)

(3) PPE for the hazard as per ~~NFPA 472~~ NFPA 470 and OSHA regulations in 29 CFR 1910.120, “Hazardous Waste Operations and Emergency Response” (HAZWOPER)

Submitter Information Verification

Committee: TEC-AAA

Submittal Date: Mon Nov 23 10:13:12 EST 2020

Committee Statement

Committee Statement: This change was made due to the ERRS consolidation plan and to update the cross-reference from NFPA 472 to NFPA 470 as NFPA 472 is now consolidated into NFPA 470.

Response Message: SR-153-NFPA 2500-2020