NFPA 1584

Recommended Practice on the Rehabilitation of Members Operating at Incident Scene Operations and Training Exercises

2003 Edition

This edition of NFPA 1584, *Recommended Practice on the Rehabilitation of Members Operating at Incident Scene Operations and Training Exercises*, was prepared by the Technical Committee on Fire Service Occupational Medical and Health and acted on by NFPA at its November Association Technical Meeting held November 16–20, 2002, in Atlanta, GA. It was issued by the Standards Council on January 17, 2003, with an effective date of February 6, 2003.

This edition of NFPA 1584 was approved as an American National Standard on January 17, 2003.

Origin and Development of NFPA 1584

The Technical Committee on Fire Service Occupational Medical and Health has responsibility for this document. The members of the committee have developed standards in areas of incident management, occupational medical programs, fitness evaluation, fire department safety officer, and infectious disease control programs. These standards fall under the umbrella of NFPA 1500, *Standard on Fire Department Occupational Safety and Health Program*, 2002 edition.

An integral component of both an occupational safety and health program and incident scene management is an organized approach for fire department members' rehabilitation at incident scene operations.

The concept of incident scene rehabilitation has been discussed and utilized throughout the fire service in various sizes and configurations. Many departments have utilized material from the United States Fire Administration, as well as material from emergency medical services. Progressive departments have shared their “lessons learned” in the development of this document.

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Committee Scope: This Committee shall have primary responsibility for documents on occupational medicine and health in the working environment of the fire service.

This list represents the membership at the time the Committee was balloted on the final text of this edition. Since that time, changes in the membership may have occurred. A key to classifications is found at the back of the document.

NOTE: Membership on a committee shall not in and of itself constitute an endorsement of the Association or any document developed by the committee on which the member serves.

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NOTICE: An asterisk (*) following the number or letter designating a paragraph indicates that explanatory material on the paragraph can be found in Annex A.

A reference in brackets [ ] following a section or paragraph indicates material that has been extracted from another NFPA document. As an aid to the user, Annex C lists the complete title and edition of the source documents for both mandatory and nonmandatory extracts. Editorial changes to extracted material consist of revising references to an appropriate division in this document or the inclusion of the document number with the division number when the reference is to the original document. Requests for interpretations or revisions of extracted text should be sent to the technical committee responsible for the source document.

Information on referenced publications can be found in Chapter 2 and Annex C.

Chapter 1 Administration

1.1 Scope.

This recommended practice establishes the minimum level of criteria for developing and implementing a rehabilitation process for fire department members at incident scene operations and training exercises.

1.2 Purpose.

This recommended practice provides for the rehabilitation of members operating within an incident management system rehabilitation component, including but not limited to, the following:

(1) Medical evaluation and treatment

(2) Food and fluid replenishment

(3) Relief from climatic conditions

(4) Rest and recovery

(5) Member accountability

Chapter 2 Referenced Publications

2.1 General.

The documents or portions thereof listed in this chapter are referenced within this recommended practice and should be considered part of the recommendations of this document.

2.2 NFPA Publications.

National Fire Protection Association, 1 Batterymarch Park, P. O. Box 9101, Quincy, MA 02269-9101.

NFPA 1500, *Standard on Fire Department Occupational Safety and Health Program,* 2002 edition.

NFPA 1561, *Standard on Emergency Services Incident Management System,* 2002 edition.

2.3 Other Publications. (Reserved)

Chapter 3 Definitions

3.1 General.

The definitions contained in this chapter apply to the terms used in this recommended practice. Where terms are not included, common usage of the terms applies.

3.2 NFPA Official Definitions.

3.2.1* **Approved.** Acceptable to the authority having jurisdiction.

3.2.2* **Authority Having Jurisdiction (AHJ).** The organization, office, or individual responsible for approving equipment, materials, an installation, or a procedure.

3.2.3 Recommended Practice. A document that is similar in content and structure to a code or standard but that contains only nonmandatory provisions using the word "should" to indicate recommendations in the body of the text.

3.2.4 Should. Indicates a recommendation or that which is advised but not required.

3.3 General Definitions.

3.3.1 Advanced Life Support (ALS). Emergency medical treatment beyond basic life support level as defined by the medical authority having jurisdiction. [**1500:**3.1]

3.3.2* **Company.** A group of members having the following characteristics: (1) under the direct supervision of an officer or leader; (2) trained and equipped to perform assigned tasks; (3) usually organized and identified as engine companies, ladder companies, rescue companies, or squad companies; (4) usually operating with one piece of fire apparatus (e.g., quint, pumper, ladder truck, elevating platform, rescue, squad, or ambulance); (5) arriving at the incident scene on fire apparatus or assembling at the scene prior to assignment; (6) company configurations shall be permitted to allow for multiple apparatus that are dispatched and arrive together and continuously operate together and are managed by a

single company officer.

3.3.3 Crew. A two-person team of fire fighters.

3.3.4 Emergency Incident. A specific emergency operation. [**1500:**3.3]

3.3.5 Emergency Medical Services. The provision of treatment — such as first aid, cardiopulmonary resuscitation, basic life support, advanced life support, and other pre-hospital procedures including ambulance transportation — to patients.

3.3.6 Emergency Operations. Activities of the fire department relating to rescue, fire suppression, emergency medical care, and special operations, including response to the scene of the incident and all functions performed at the scene. [**1500:**3.3]

3.3.7 Health and Safety Officer. The member of the fire department assigned and authorized by the fire chief as the manager of the safety and health program and who performs the duties and responsibilities specified in this recommended practice.

3.3.8 Hydration. A fluid balance between water lost by normal functioning and oral intake of fluids in the form of liquid and foods that contain water.

3.3.9 Incident Commander. The fire department member in overall command of an emergency incident.

3.3.10 Incident Management System (IMS). A system 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; the system is also referred to as an incident command system (ICS). [**1021:**1.4]

3.3.11 Incident Safety Officer. An individual appointed to respond to or assigned at an incident scene by the incident commander to perform the duties and responsibilities specified in this standard. This individual can be the health and safety officer or it can be a separate function.

3.3.12* Member. A person involved in performing the duties and responsibilities of a fire department, under the auspices of the organization. [**1582:**1.4]

3.3.13 Personnel Accountability System. A system that readily identifies both the location and function of all members operating at an incident scene. [**1500:**3.3]

3.3.14 Procedure. An organizational directive issued by the authority having jurisdiction or by the department that establishes a specific policy that must be followed. [**1561:**3.3]

3.3.15 Rate of Perceived Exertion (RPE). A scale created to determine the intensity level of an individual's exertion. Numeric values are assigned according to the individual's fatigue, environment, muscle factors, etc. It takes into account the subjective aspects of an individual's physical and emotional state, rather than relying solely on an objective percentage of age-predicted maximum heart rate.

3.3.16 Rehabilitation. The process of providing rest, rehydration, nourishment, and medical evaluation to members who are involved in extended or extreme incident scene operations.

3.3.17 Sports Drink. A fluid replacement beverage that is between 4 percent and 8 percent

carbohydrate and contains between 0.5 g and 0.7 g of sodium per liter of solution.

3.3.18 Tactical Level Management Component (TLMC). A management unit identified in the incident management system commonly known as "division," "group," or "sector." [**1561:**3.3]

Chapter 4 Pre-Incident Response

4.1 General.

4.1.1 Standard Operating Procedures.

4.1.1.1 The fire department should develop standard operating procedures (SOPs) that outline a systematic approach for the rehabilitation of members operating at incidents.

4.1.1.2 These procedures should include medical evaluation and treatment, food and fluid replenishment, crew rotation, and relief from extreme climatic conditions.

4.1.2 Protocols and procedures guiding emergency medical service (EMS) providers who care for ill or injured members during emergency operations should be developed by the EMS medical director in collaboration with the fire department physician and chief.

4.2 Training and Recognition of Heat/Cold Stressors and Stress Symptoms.

4.2.1 Members should be trained to recognize heat/cold stressors and stress symptoms as follows:

(1) Heat stress symptoms include nausea, flushed skin, cramping, headache, mental confusion, rapid heartbeat, shortness of breath, weakness or exhaustion, seizures, sunburn, and absence of sweating.

(2) Cold stress symptoms include headache, mental confusion, numbness, waxy/pale skin, dehydration, low or absent blood pressure, slow pupil response, muscle rigidity or stiff posture, and blistered skin.

4.2.2 All members should be trained in reducing the risks from extreme heat and cold conditions.

4.2.2.1* A recommended way to reduce risk is through sufficient hydration, diet, limited outdoor physical exercise on hot days, acclimatization, and monitoring of weather conditions to ensure members understand the dangers associated with working in climatic conditions.

4.2.3* Members should be encouraged to maintain their physical conditioning to minimize the detrimental effects of emergency operations and training exercises on the human body and to optimize their performance under extreme conditions.

4.2.4 Procedures should be in place to ensure that rehabilitation operations commence whenever emergency operations pose the risk of members exceeding a safe level of physical or mental endurance.

4.3 Pre-Incident and Fireground Training Operations.

4.3.1 Proper hydration, nutrition, and diet are recommended to maintain normal body function.

4.3.2 Daily hydration should include 6 oz to 8 oz of fluids every 6 hours in addition to those fluids ingested with meals.

4.3.3* When a specific event is known in advance, hydration should include an additional 0.5 L (16 oz) of fluids within 2 hours prior to the event, according to the following considerations:

(1) When hydration is taken with a meal, water is appropriate.

(2) Water or sports drinks are appropriate for prehydration when scheduled activities are of moderate intensity and are expected to last less than 1 hour.

(3) Sports drinks are preferred for prehydration when scheduled activities are of higher intensity and are expected to last 1 hour or longer.

4.3.4 Proper nutrition should include the following:

(1) Carbohydrates (fruits, vegetables, grains, starches)

(2) Protein and fat intake in smaller amounts

(3) Smaller, more frequent meals

4.3.5 Beverages and foods that should be avoided include the following:

(1) Caffeinated, carbonated, high-fructose-content, and high-sugar drinks (exceeding 7 percent CHO solution)

(2) Foods with high fat and/or high protein content

(3) Alcohol within 8 hours prior to duty

(4) Excessive fluids

Chapter 5 Rehabilitation Area Characteristics

5.1 Area for Rehabilitation.

The incident commander should ensure that there is an adequate area or facility to conduct rehabilitation to reduce the effects of extreme weather conditions on members.

5.1.1 For extreme heat conditions, this area should have shaded areas, misting systems and/or fans, an air-conditioned area, and an area to sit down.

5.1.2 For extreme cold and/or wet conditions, this area should provide dry protected areas, heated areas, and dry clothing.

5.1.3 At times, due to the size of the operation or geographic barriers, it is recommended to

establish more than one rehabilitation area. Each should be given a geographic name consistent with a location at the incident site (e.g., "North Rehabilitation"/"South Rehabilitation" or "1st Floor Rehab"/"12th Floor Rehab").

5.2 Site Characteristics.

5.2.1 The site should be in a location that will provide physical rest and thus allow the body to recuperate from the demands and hazards of the emergency operation or training evolution.

5.2.2 The site should be sufficiently far away from the effects of the operation that members can safely remove their personal protective equipment (PPE) and self-contained breathing apparatus (SCBA) and can be afforded mental rest from the stress and pressure of the emergency operation or training evolution.

5.2.3 The site should provide suitable protection from the prevailing environmental conditions as follows:

(1) During hot weather, it should be in a cool, shaded area.

(2) During cold weather, it should be in a warm, dry area.

5.2.4 The site should enable members to be free of exhaust fumes from apparatus, vehicles, or equipment (including those involved in the Rehabilitation Group/Rehabilitation Sector operations).

5.2.5 The site should be large enough to accommodate multiple crews, based on the size of the incident.

5.2.6 There should be an area where members can remove and leave their SCBA and PPE prior to entering the designated rehabilitation area.

5.2.7* The site should be easily accessible to a medical treatment area.

5.2.8 The site should allow prompt reentry back into the emergency operation upon complete recuperation.

5.3* Establishing Rehabilitation Facilities.

The Incident Commander or Rehabilitation Unit Leader should determine the appropriate means to establish a rehabilitation area for members.

5.4* Establishing Rehabilitation Resources.

The Incident Commander or Rehabilitation Unit Leader should identify those resources to be used at an incident rehabilitation facility.

Chapter 6 Incident Scene and Fireground Training Rehabilitation

6.1* Criteria for Implementation.

Rehabilitation operations should commence whenever emergency operations or training exercises pose the risk of members exceeding a safe level of physical or mental endurance.

6.2 Providing Rehabilitation Operations.

Rehabilitation operations should be provided in accordance with fire department standard operating procedures (SOPs), NFPA 1500, *Standard on Fire Department Occupational Safety and Health Program*, and NFPA 1561, *Standard on Emergency Services Incident Management System*.

6.2.1 Members should be assigned to rehabilitation as prescribed by departmental SOPs.

6.2.2 Unusual circumstances, such as large-scale incidents, long-duration incidents, labor-intensive incidents, or those associated with significant climatic extremes, should require an alteration in procedures.

6.3* Role of Emergency Medical Services (EMS).

Emergency medical services should be available in the incident scene rehabilitation tactical level management component for evaluation and treatment of members.

6.3.1 Basic life support (BLS) should be the minimum level of available care.

6.3.2 Advanced life support (ALS) personnel should be considered preferable where they are available.

6.3.3* EMS personnel should briefly question members arriving at rehabilitation to determine if they have any symptoms of dehydration, heat stress, cold stress, physical exhaustion, cardiopulmonary abnormalities, emotional/mental stress, and/or emotional/mental exhaustion and should utilize the Rating of Perceived Exertion (RPE).

6.3.4 EMS personnel should assess and treat any member having signs or symptoms of heat stress or cold stress.

6.3.5 In the event of an injury to a member during emergency operations, EMS personnel should assess and treat the injury, based on local EMS protocol and fire department standard operating procedures.

6.4 Role of Members.

Members assigned to rehabilitation should add/remove clothing to regain normal body temperature, drink fluids (water and sports drinks), eat food, and rest.

6.4.1* All members entering and leaving rehabilitation should be assigned by the incident commander and should be tracked through the personnel accountability system.

6.5 Rehabilitation Process.

6.5.1 In extreme heat conditions, the rehabilitation process should provide for the following:

(1) Members removing all protective clothing

(2) Fluid and food to replace water, electrolytes, and calories lost during the incident

(3) A shaded or misted area for initial cool-down of members, with fans to create air movement, if necessary

(4) An air-conditioned area for extended rehabilitation to which members can be moved after their body temperatures have stabilized in the initial cooldown area

(5) Medical evaluation and treatment for heat emergencies per local EMS protocols

6.5.2 In extreme cold conditions, the rehabilitation process should provide for the following:

(1) A dry area shielded from the wind or other elements

(2) Fluid and food to replace water, electrolytes, and calories lost during the incident

(3) Members removing wet protective clothing and wet garments and donning dry clothing

(4) A heated area for extended rehabilitation

(5) Medical evaluation and treatment for cold emergencies per local EMS protocols

6.6 Medical Evaluation and Treatment.

6.6.1 When a rehabilitation tactical level management component (TLMC) has been established, medical evaluation and treatment protocols should be followed.

6.6.1.1* The Incident Commander (IC)/rehabilitation unit leader should give preference to the most highly trained personnel available when assigning medical evaluation/treatment personnel.

6.6.1.2* Upon admittance to rehabilitation, members should be evaluated for the following:

(1) RPE 1–10 scale

(2) Heart rate

(3) Blood pressure

(4) Temperature

6.6.2* Parameters for extended rehabilitation should be established by the fire department physician.

6.6.2.1 Members meeting established parameters should be evaluated after 20 minutes in the rehabilitation area.

6.6.2.2* If a member remains within one or more of these parameters after 20 minutes, the member should be directed to the medical treatment area.

6.6.2.3 RPE scale before/after indications should be used to help determine discrepancies in rehabilitation status.

6.6.3 Personnel assigned to work in the medical treatment area should be distinct from those assigned to the rehabilitation area.

6.7 Company/Crew Level Rehabilitation (Self-Rehabilitation).

6.7.1 Multiple locations for self–fluid replacement should be established, based on size and type of incident.

6.7.2 Company officers should ensure that fluids are available on apparatus where spare SCBA cylinders are located so that members can replace fluids while changing SCBA cylinders.

6.8* Fluid Intake.

Members should have fluid intake as follows:

(1) Fluid intake of 2 oz to 4 oz approximately every 20 minutes during structural fire fighting

(2) Fluid intake of 2 oz to 4 oz approximately every 20 minutes during major medical/MCI

(3) Fluid intake of 2 oz to 4 oz approximately every 15 minutes to 30 minutes during hazmat/special operations (considering time element in removing protective clothing)

(4) Fluid intake of 2 oz to 4 oz approximately every 20 minutes during wildland fire fighting, emphasizing sports drinks due to long duration of event

6.9 Rehabilitation in the Rehabilitation Area.

6.9.1* In the rehabilitation area, fluid intake should be increased to 12 oz to 32 oz during a 20-minute rest period.

6.9.2 When operating in temperature extremes (hot or cold), members should increase fluid intake.

6.10 Member Accountability.

Member accountability is a critical factor that needs to be maintained during rehabilitation in accordance with NFPA 1500, *Standard on Fire Department Occupational Safety and Health Program*, and NFPA 1561, *Standard on Emergency Services Incident Management System*. *(See Annex B.)*

6.11 Work-to-Rest Ratio.

6.11.1* Company/crew level rehabilitation (self-rehabilitation) or rehabilitation in a rehabilitation area should follow these guidelines:

(1) Up to one 30-minute SCBA cylinder or 20 minutes of intense work without SCBA to at least 10 minutes of self-rehabilitation (rest with hydration) as a company or crew. The company officer or crew leader should ensure that all members in the company or crew seem fit to return to duty.

(2) Up to two 30-minute SCBA cylinders or one 45-minute or 60-minute SCBA cylinder when encapsulating chemical protective clothing is worn or 40 minutes of work without SCBA to at least 20 minutes of rest (with hydration) in a rehabilitation area.

6.11.2 When a rehabilitation area is established, no member should be reassigned to return to duty before being medically evaluated, hydrated for at least 10 minutes in rehabilitation, and cleared by EMS personnel.

6.11.3 Crews should be released from the rehabilitation area and ultimately the incident scene in a "first-in, first-out" fashion.

6.11.4 Personnel should operate at an incident for no more than 12 hours without being provided with a multihour break away from the scene.

6.12 Reassignment.

6.12.1 Reassignment of resources from rehabilitation should be conducted as it would between any other tactical level management components.

6.12.2 If all crew members are fit for duty, the following reassignment options should be considered:

(1) Members can return to quarters if they are no longer needed at the incident.

(2) Members can receive a new incident assignment and return to work.

(3) Members can be assigned to the staging area to await an incident assignment.

6.12.3 If one or more crew members are not fit to return to duty, the following reassignment options should be considered for the remaining crew members:

(1) Members can be given an incident assignment that requires fewer personnel.

(2) Members can be partnered with another crew and given an incident assignment.

(3) All members can remain as a crew resource in the rehabilitation area.

6.12.4 If one or more of the crew members is seriously injured or killed during the incident, all members of the crew should be removed from service and should undergo critical incident stress management procedures per department policy.

6.13 Documentation.

6.13.1* Time-in/time-out for crews entering or leaving the rehabilitation area should be documented.

6.13.2* If medical evaluation is necessary, a rehabilitation evaluation report should document the evaluation.

6.13.3 If medical treatment is required, EMS documentation should be completed as well as responder injury and workers' compensation reports.

Chapter 7 Post-Incident

7.1 Recovery.

7.1.1* Fluid intake should include 12 oz to 32 oz over a period of up to 2 hours after the end of an operation.

7.1.2 Certain types of foods should be consumed during or following an incident, such as the following:

(1) Carbohydrates (fruits, vegetables, grains, starches)

(2) Protein (lean meats, legumes, and protein supplements)

7.1.3 Certain types of food and beverages should be avoided during or following an incident, such as the following:

(1) High-fat meals

(2) Foods and beverages that potentially can cause gastric distress, including the following:

  (a) Carbonated beverages

  (b) Foods with excessive caloric content

  (c) Beverages with excessive caffeine

7.2* Monitoring for Signs of Dehydration.

Urine output and color should be monitored for signs of dehydration.

Annex A Explanatory Material

Annex A is not a part of the recommendations of this NFPA document but is included for informational purposes only. This annex contains explanatory material, numbered to correspond with the applicable text paragraphs.

A.3.2.1 Approved. The National Fire Protection Association does not approve, inspect, or certify any installations, procedures, equipment, or materials; nor does it approve or evaluate testing laboratories. In determining the acceptability of installations, procedures, equipment, or materials, the authority having jurisdiction may base acceptance on compliance with NFPA or other appropriate standards. In the absence of such standards, said authority may require evidence of proper installation, procedure, or use. The authority having jurisdiction may also refer to the listings or labeling practices of an organization that is concerned with product evaluations and is thus in a position to determine compliance with appropriate standards for the current production of listed items.

A.3.2.2 Authority Having Jurisdiction (AHJ). The phrase "authority having jurisdiction," or its acronym AHJ, is used in NFPA documents in a broad manner, since jurisdictions and

approval agencies vary, as do their responsibilities. Where public safety is primary, the authority having jurisdiction may be a federal, state, local, or other regional department or individual such as a fire chief; fire marshal; chief of a fire prevention bureau, labor department, or health department; building official; electrical inspector; or others having statutory authority. For insurance purposes, an insurance inspection department, rating bureau, or other insurance company representative may be the authority having jurisdiction. In many circumstances, the property owner or his or her designated agent assumes the role of the authority having jurisdiction; at government installations, the commanding officer or departmental official may be the authority having jurisdiction.

A.3.3.2 Company. For fire suppression, jurisdictions exist where the response capability of the initial arriving company is configured with the response of two apparatus. In some jurisdictions, apparatus is not configured with seated and belted positions for four personnel, and therefore the company would respond with an additional vehicle in consort with the initial arriving engine to carry additional personnel. This response would ensure that a minimum of four personnel are assigned to and deployed as a company. The intent of this definition and the recommendations in the recommended practice are to assure that these two (or more) pieces of apparatus are always dispatched and respond together as a single company. Some examples of this include the following:

(1) Engine and tanker/tender that would be responding outside a municipal water district

(2) Multiple-piece company assignment, specified in a fire department's response SOPs, such as an engine company response with a pumper and a hose wagon

(3) Engine with a vehicle personnel carrier

(4) Engine with an ambulance or rescue unit

A.3.3.12 Member. Fire department personnel can be full-time or part-time employees or paid or unpaid volunteers, can occupy any position or rank within the fire department, and might or might not engage in emergency operations.

A.4.2.2.1 All members should train to acclimate to appropriate environmental conditions. The process of acclimatization should be done in a manner that builds up the member's ability to exercise or perform under more extreme conditions.

A.4.2.3 Departments and members should follow NFPA 1583, *Standard on Health-Related Fitness Programs for Fire Fighters*.

A.4.3.3 Consumption of smaller amounts of fluids more frequently is recommended to facilitate excretion and bladder comfort (e.g., 2 oz to 4 oz servings). Scheduled events can include planned training and mass gatherings. Members should drink water every day, but water can quench thirst without providing needed carbohydrates and electrolytes. If activities that are likely to induce heat stress are planned or scheduled, drinking sports drinks before the activities can help reduce the effects of heat stress during those activities. Proper diet throughout the day can also help reduce these risks.

If high-intensity and/or long-duration activities are anticipated, consider increasing recommended servings of fluid. Carbohydrate (CHO) and electrolyte intake should also be

increased under these conditions.

Some medications can increase the need for fluids.

If using powdered mix or concentrate for sports drink, follow the manufacturer's instructions for mixing to ensure proper balance of carbohydrate and electrolyte content. A mixture that is too concentrated will be absorbed slowly.

A.5.2.7 Figure A.5.2.7 gives an example of the layout of a rehabilitation area and treatment area.

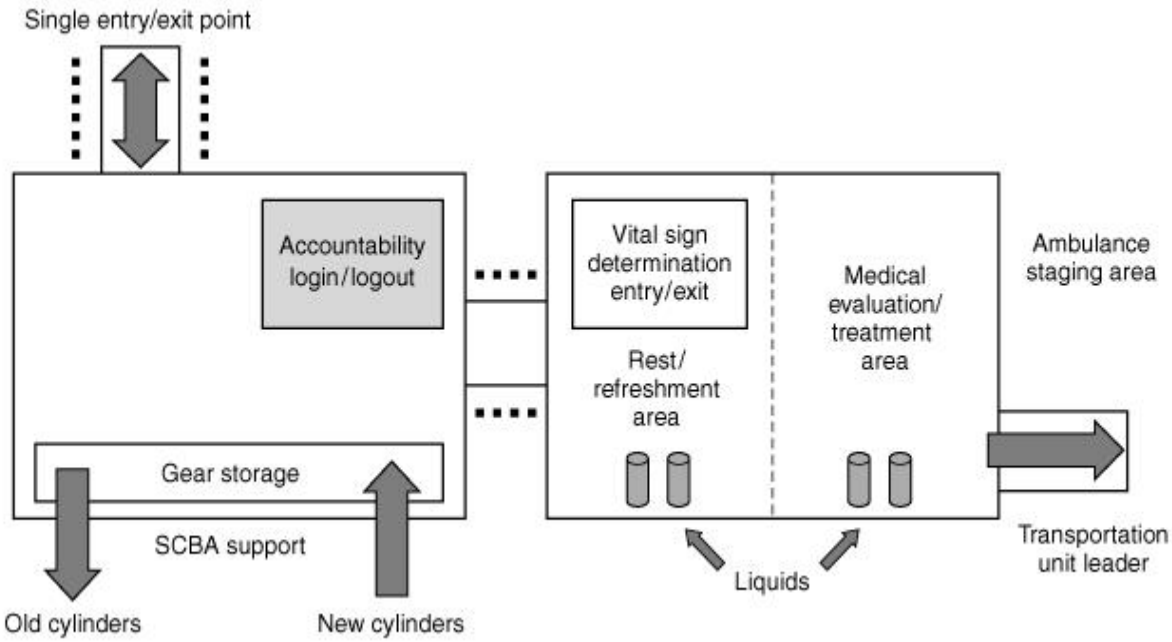

FIGURE A.5.2.7 Sample Layout of a Rehabilitation and Treatment Sector.

A.5.3 Rehabilitation facilities (where a rehabilitation area could be established) could include, but does not have to be limited to, the following:

(1) A nearby garage, building lobby, or other structure

(2) An open area in which a rehabilitation area can be created using tarps, fans, and so on

(3) Tents or other portable structures

(4) Several floors below a fire in a high-rise building

(5) A school bus or municipal bus

(6) The cabs of fire apparatus or any enclosed areas of emergency vehicles at the scene

(7) Retired fire apparatus or surplus government vehicle that has been renovated as a rehabilitation unit, which could respond by request or be dispatched during certain weather conditions

(8) Specially designed rehabilitation apparatus

A.5.4 Rehabilitation resources could include, but do not have to be limited to, the following:

(1) Portable shelters

(2) Fans/blowers

(3) Blankets

(4) Portable heaters

(5) Dry clothing

(6) Lighting

(7) Electrical generating equipment

(8) Misting and cooling equipment

(9) Rehabilitation designation marking equipment

(10) Chairs

(11) Beverage-serving equipment

(12) Exposure protective garments for rehabilitation staff

(13) Personnel washing equipment (basins, soap, water, towels)

(14) Cups (hot or cold according to the beverage)

(15) One gallon of drinking water per responder

(16) Large clock

(17) Traffic cones

(18) Fireline tape

(19) Log book and forms and writing utensils

(20) Paper towels

(21) Sanitary facilities (portable toilets)

(22) Food (including appropriate serving devices and equipment)

(23) Trash receptacles

A.6.1 Rehabilitation operations should consider the scope of the incident, including the following:

(1) *Time.* Extended use of turnout gear; extended exposure to weather conditions

(2) *Complexity*. Crime scenes, standoffs, search operations, mass gatherings/public events, and so on

(3) *Intensity.* Mental and/or physical stress on a member, such as major extrications, actual fire attack, or interior search and rescue

Rehabilitation operations should consider hot weather conditions, including the following:

(1) Temperature *(See Table A.6.1.)*

(2) Relative humidity *(See Table A.6.1.)*

(3) Direct sunlight

Rehabilitation operations should consider cold weather conditions, including the following:

(1) Temperature

(2) Wind speed

(3) Moisture

The National Weather Service (NWS) implemented a new wind chill–temperature (WCT) index during the 2001–2002 winter season *(see Figure A.6.1)*. The reason for the change was to improve the previous index used by the NWS and the Meteorological Services of Canada (MSC), which was based on the 1945 Siple and Passel index. Most of the changes in the new index are at temperatures below 5°F.

The new WCT index makes use of advances in meteorology, biometeorology, and computer modeling to provide a more accurate, more useful formula for calculating the dangers of winter winds and freezing temperatures. In addition, clinical trials have been conducted and the results of those trials have been used to verify and improve the accuracy of the new formula.

Specifically, the improvements of the new WCT index are as follows:

(1) It uses calculated wind speeds at an average height of 5 ft (typical height of a human face) based on readings from the national standard height of 33 ft (typical height of an anemometer).

(2) It is based on the latest heat transfer theory; i.e., heat loss from the body to its surroundings during cold and breezy/windy days.

(3) It uses a standard factor for skin tissue and assumes a no sunlight scenario.

Table A.6.1 Heat Stress Index

Relative Humidity (percent)	Air Temperature (°F)						
	70	75	80	85	90	95	1
	Apparent Temperature						
0	64	69	73	78	83	87	9
10	65	70	75	80	85	90	9
20	66	72	77	82	87	93	9
30	67	73	78	84	90	96	1
40	68	74	79	86	93	101	1
50	69	75	81	88	96	107	1
60	70	76	82	90	100	114	1
70	70	77	85	93	106	124	1
80	71	78	86	97	113	136	1

Table A.6.1 Heat Stress Index

Relative Humidity (percent)	Air Temperature (°F)						
	70	75	80	85	90	95	1
	Apparent Temperature						
90	71	79	88	102	122	150	1
100	72	80	91	108	133	166	

Apparent Temperature °F	Danger Category	Injury Threat
Below 80	None	Little or no danger under norma
80–90	Caution	Fatigue possible if exposure is p
91–105	Extreme Caution	Heat cramps and heat exhaustio activity
106–130	Danger	Heat cramps or exhaustion likel physical activity
Above 130	Extreme Danger	Heat stroke imminent!

Note: Add 10°F when protective clothing is worn and add 10°F when in direct sunlight.
Source: U.S. Fire Administration, FA-114, *Emergency Incident Rehabilitation*, July 1992.

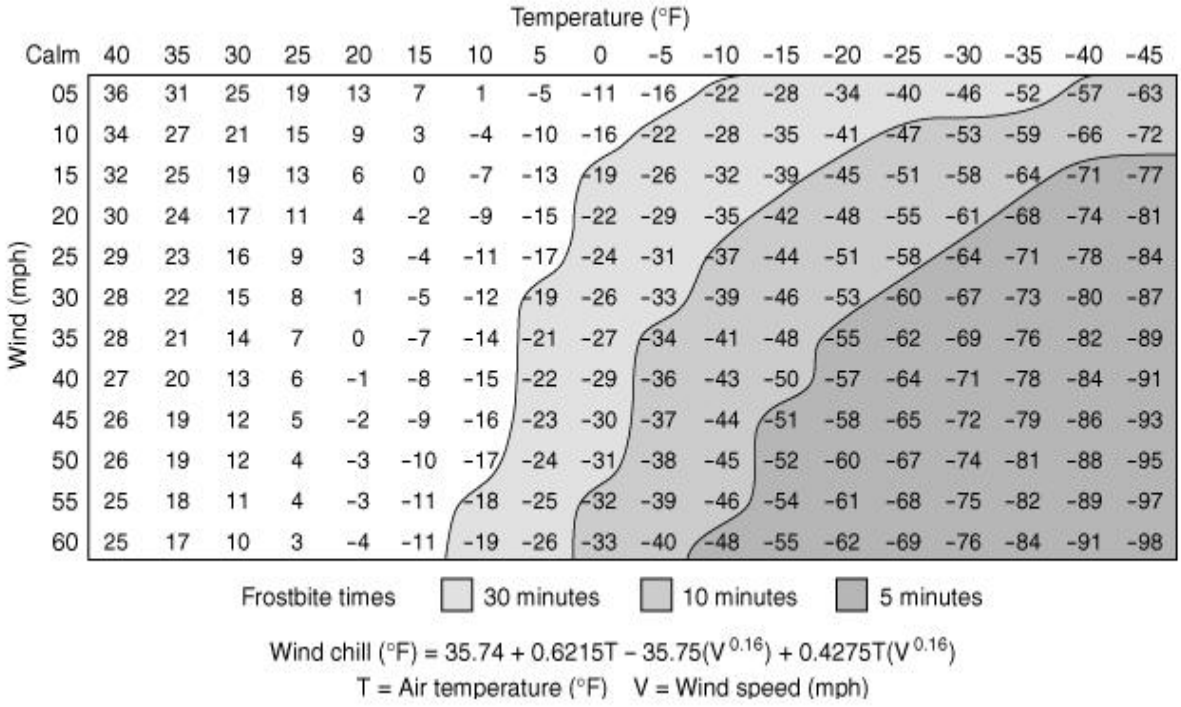

FIGURE A.6.1 National Weather Service Wind Chill–Temperature (WCT) Index. (Source: National Weather Service)

A.6.3 A transport-capable EMS unit should be considered for rehabilitation areas at all incidents and fireground training. NFPA 1500, *Standard on Fire Department Occupational Safety and Health Program*, and NFPA 1561, *Standard on Emergency Services Incident Management System*, require that a transport-capable EMS unit be standing by at special operations.

A.6.3.3 It is recommended that members be familiar with the RPE scale prior to incident use. This scale can be used as a relative "before/after" comparison to assist in determining a member's readiness to return to duty. Instruments such as tympanic thermometers, pulse oximeters, and similar instruments can be used to expedite this process.

The original chart for RPE was created by Dr. Gunnar Borg, and is therefore often referred to as the Borg scale. This scale started at a low end of 6 and ended at a high end of 20. Borg originally created this scale to directly correspond to heart rates, so that a 6 would be equal to a heart rate of 60 beats per minute. Therefore, on the Borg scale, most individuals would rate between 12 and 16 during maximum exertion.

To assist the user of the document, a new chart has been created that simply goes from 1–10. On a scale of 1–10, 10 being hardest, most individuals rate between 4 and 7 at maximum exertion. The American College of Sports Medicine suggests that 4 to 6 RPE equates with "somewhat hard to hard" exertion, and that that correlates with 60 percent to 85 percent of maximum heart rate. Table A.6.3.3 is an example of this chart.

Table A.6.3.3 New RPE Scale

New RPE Scale	Borg RPE Scale	Description
1	6	No exertion at all
	7	Extremely light
	8	
2	9	Very light
	10	
3	11	Light
4	12	
5	13	Somewhat hard
6	14	
7	15	Hard heavy
8	16	
8.5	17	Very hard
9	18	
9.5	19	Extremely hard
10	20	Maximal exertion

Source: G. Borg, *Borg's Perceived Exertion and Pain Scales*.

A.6.4.1 Refer to NFPA 1561, *Standard on Emergency Services Incident Management System*.

A.6.6.1.1 Due to the potential need for IV therapy, ALS personnel should be used.

A.6.6.1.2 Currently there are no studies that quantify vital sign measurements with the length of rehabilitation or with the need to direct members to a treatment area. Visual signs and symptoms remain the best method to evaluate members in the rehabilitation area. Vital sign measurements can be used as a baseline or to assist with treatment should it be deemed

necessary.

A.6.6.2 Guidelines to assist physicians in determining parameters may be found in NFPA 1582, *Standard on Medical Requirements for Fire Fighters and Information for Fire Department Physicians*, and NFPA 471, *Recommended Practice for Responding to Hazardous Materials Incidents*.

A.6.6.2.2 Ideally, the Incident Commander would maintain an ambulance(s) in staging. The treatment area would be arranged to allow easy ingress/egress for transport units.

A.6.8 Overhydration (drinking too much, too fast) during operations can cause gastric discomfort or gastric distention, which can cause vomiting. During high-intensity, long-duration activity (longer than 1 hour), the following are recommended:

(1) Ingest 30 g/hr to 60 g/hr of carbohydrate.

(2) Drink 8 oz of sports drink containing approximately 15 g of carbohydrate.

(3) Consume other readily available carbohydrate sources, such as fruit and meal replacement bars.

Members who are fighting wildland fires should carry fluids and foods that can be easily transported and maintained (energy bars, fruit, sports drinks, and water bottles).

A.6.9.1 From Dickinson, p. 34. Also see Wieder and Dickinson.

A.6.11.1 These guidelines also help enhance the accountability of members at the incident or training ground.

A.6.13.1 Figure A.6.13.1 shows a crew time-in/time-out report.

REHAB SECTOR — COMPANY CHECK IN/OUT SHEET

Crews operating on the scene: _____

_____

Unit No.	Member	Time In	Time Out		Unit No.	Member	Time In	Time Out

FIGURE A.6.13.1 Example of a Rehabilitation Sector Company Check-in/Check-out Sheet.

A.6.13.2 Figure A.6.13.2 shows a rehabilitation evaluation report.

EMERGENCY INCIDENT REHABILITATION REPORT

Incident: ______________________________ Date: ______________

Name/ Unit No.	Time(s)	Time/# Cylinders	BP	Pulse	Resp.	Temp.	Skin	Taken By	Complaints/ Condition	Transport

FIGURE A.6.13.2 Example of an Emergency Incident Rehabilitation Report.

A.7.1.1 Because plain water ingestion may suppress thirst and increase urine output, it is less effective for rapid rehydration than sports drinks.

A.7.2 Signs of dehydration include low urine volume, urine with a strong odor, and urine of a dark color.

Annex B Accountability

This annex is not a part of the recommendations of this NFPA document but is included for informational purposes only.

B.1

Accountability during member rehabilitation is maintained, as it would be during any other incident operation. Each crew or company stays together when entering or exiting the rehabilitation area. Member accountability goes beyond simply tracking the location of people. Equally important to personnel tracking is the function of tracking the completion of an assignment. Members have the responsibility to alert their supervisor of the need for rehabilitation; in most cases, however, the responsibility and accountability for ensuring the safety and welfare of members lie with the supervisor of a company/crew. Thus, the company officer/crew leader will often be charged with making decisions regarding the initiation of rehabilitation and the completion of rehabilitation.

It is important to recognize that rehabilitation can occur in more than one form, each form representing unique accountability concerns. Rehabilitation involves establishing a tactical level management component such as a "Rehabilitation Group" or "Rehabilitation Sector." Rehabilitation also occurs at the company/crew level.

Rehabilitation often takes place without the establishment of rehabilitation as a tactical-level management component. During routine incidents, such as a single-family dwelling fire or a small wildland fire, companies/crews will often conduct rehabilitation on their own. This can be a result of their own initiative or of an informal order to "take a break." Company/crew-level rehabilitation can occur during a cylinder change, the transition from active fire attack to overhaul, or other similar situations. Self-rehabilitation will also take place when command fails to recognize the need for rehabilitation. In any case, accountability during company/crew-level rehabilitation will most likely show the company/crew as still assigned to an active function. Provided the company/crew remains intact, command will have ready access to information about the location and condition of the company/crew in the event of an emergency. Companies/crews that are not able to continue performing their function will report their status to command.

When a formal assignment and area for rehabilitation is established, accountability is maintained as it would be with any other tactical level management component. The rehabilitation area should have a check-in/check-out point that manages accountability and becomes the communication link between command and the company/crew. Members who are not allowed to leave rehabilitation with their company/crew are appropriately moved

within the IMS/accountability system to reflect their current assignments. The staff at a formally assigned rehabilitation area should have the option to use a log-in/log-out sheet if required by the management needs of the rehabilitation area.

Annex C Informational References

C.1 Referenced Publications.

The following documents or portions thereof are referenced within this recommended practice for informational purposes only and are thus not part of the recommendations of this document unless also listed in Chapter 2.

C.1.1 NFPA Publications. National Fire Protection Association, 1 Batterymarch Park, P.O. Box 9101, Quincy, MA 02269-9101.

NFPA 471, *Recommended Practice for Responding to Hazardous Materials Incidents*, 2002 edition.

NFPA 1500, *Standard on Fire Department Occupational Safety and Health Program*, 2002 edition.

NFPA 1561, *Standard on Emergency Services Incident Management System*, 2002 Edition.

NFPA 1582, *Standard on Medical Requirements for Fire Fighters and Information for Fire Department Physicians*, 2000 edition.

NFPA 1583, *Standard on Health-Related Fitness Programs for Fire Fighters*, 2000 edition.

C.1.2 Other Publications.

Borg, G. *Borg's Perceived Exertion and Pain Scales*, Champaign, IL: Human Kinetics, 1998.

Dickinson, E. T. "Protecting Our Own: Refuel, Recharge, Rehab," *J. Emergency Management Services* 25, no. 11 (2000):25–35.

Wieder, M., and E. T. Dickinson. *Emergency Incident Rehabilitation.* Upper Saddle River, NJ: Brady/IFSTA, 2000.

C.2 Informational References.

The following documents or portions thereof are listed here as informational resources only. They are not a part of the recommendations of this document.

C.2.1 NFPA Publications. National Fire Protection Association, 1 Batterymarch Park, P.O. Box 9101, Quincy, MA 02269-9101.

NFPA 471, *Recommended Practice for Responding to Hazardous Materials Incidents*, 2002 edition.

NFPA 1021, *Standard for Fire Officer Professional Qualifications*, 1997 edition.

NFPA 1521, *Standard for Fire Department Safety Officer*, 2002 edition.

NFPA 1582, *Standard on Medical Requirements for Fire Fighters and Information for Fire Department Physicians*, 2000 edition.

NFPA 1583, *Standard on Health-Related Fitness Programs for Fire Fighters*, 2000 edition.

C.2.2 Other Publications.

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J. Emergency Medical Services, November 2000, p. 34.

Kenney, W. L. "Fluid Intake During Cold Weather," *Penn State University Sports Medicine Newsletter,* 1997.

Pearson, D. "Avoiding Dehydration: What to Drink," *Strength and Conditioning Journal,* June 1999.

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Shireffs, S. M., and R. J. Maugham. "Rehydration and Recovery of Fluid Balance after Exercise," *Exercise and Sports Reviews (ACSM)* 28, no. 1 (January 2000).

U.S. Fire Administration (USFA). FA-114, *Emergency Incident Rehabilitation*. Emmitsburg, MD: USFA July 1992.

Wieder, M., and E. Dickinson. *Emergency Incident Rehabilitation*. Upper Saddle River, NJ: Brady/IFSTA, 2000.

C.3 References for Extracts.

The following documents are listed here to provide reference information, including title and edition, for extracts given throughout this recommended practice as indicated by a reference in brackets [ ] following a section or paragraph. These documents are not a part of the recommendations of this document unless also listed in Chapter 2 for other reasons.

NFPA 1021, *Standard for Fire Officer Professional Qualifications*, 1997 edition.

NFPA 1500, *Standard on Fire Department Occupational Safety and Health Program*, 2002 edition.

NFPA 1561, *Standard on Emergency Services Incident Management System*, 2002 edition.

NFPA 1582, *Standard on Medical Requirements for Fire Fighters and Information for Fire Department Physicians*, 2000 edition.