Purpose:

This guideline provides the San Diego County Operational Area procedures for fire personnel rehabilitation at the scene of a fire, other emergency operations, or training. It will ensure that personnel who might be suffering the effects of metabolic heat buildup, dehydration, physical exertion, exposure to toxins and/or extreme weather, receive evaluation and rehabilitation during strenuous activities. This guideline stresses the constant monitoring of physical and mental conditions of personnel during emergency operations and/or training.

Policy:

It is the intent of the San Diego County Fire Chiefs that no firefighter will be permitted to continue emergency operations beyond safe levels of physical or mental endurance. The intent of this plan is to lessen the risk of injury that may result from extended field operations under adverse conditions.

Procedure:

Informal Rehabilitation:

The Company Officer shall be responsible for the implementation of informal rehabilitation procedures (self-rehabilitation). This includes rehydration and monitoring for signs/symptoms of heat stress of their assigned personnel during the initial 30 minute SCBA bottle exchange or 20 minutes of strenuous work without an SCBA. These actions should be documented on an ICS-214 or in the department's RMS as appropriate. Should any members not appear fit, they should be referred to the formal rehabilitation area or medical personnel through the Incident Commander.
Wildfire incidents provide a major challenge in that personnel may be working extended work periods distant from any formal rehabilitation area. Company Officers must practice "self- preservation" techniques. This includes monitoring their own and their crew member's conditions, taking short breaks, and keeping hydrated. The excerpts listed under "Operational Approach" are borrowed from Cal Fire's Heat Injury Prevention Plan.

Formal Rehabilitation:

The Incident Commander shall be responsible for the implementation of formal personnel rehabilitation procedures. Rehabilitation shall commence when fire/emergency operations and/or training pose a health and safety risk. Typical trigger points include: the use of two (2) 30 minute SCBA cylinders, the use of one (1) 45-60 minute SCBA cylinder, when chemical protective clothing is worn, or 40 minutes of strenuous work without an SCBA. Time frames may be adjusted, either up or down, depending upon work or environmental conditions.

Operational Approach

Informal Rehabilitation:

Rest Breaks: During periods of intense work, frequent 10 to 30 minute rest breaks can significantly delay the onset of fatigue. During moderate but prolonged work, less frequent breaks of 10 minutes or more keep performance from declining. The number and length of breaks should increase after 8 hours, because fatigue builds continuously throughout a shift.

Rest Breaks: Employees shall be provided adequate rest during the course or work, preferably in shaded areas. During shifts when there is no burn injury risk, crews shall be encouraged to open or remove Nomex shirts and overpants, allowing ventilation and evaporation of perspiration to reduce body heat. Hoods shall be worn folded and draped back over the neck.

Hydration: Water replacement is essential during prolonged strenuous work in the heat. During such work, it is common to lose one to two quarts of sweat an hour. These fluids must be replaced. Drinking water before working, while working and during breaks is the best way to prevent dehydration and replenish fluids. Managers and supervisors shall be responsible for providing sufficient quantities of water prior to, during and after work in a heated environment. It is the employee's responsibility to remain hydrated. Beverages with caffeine should be avoided as these can exacerbate heat stress. It is important to note that the thirst mechanism is a delayed response. By the time the firefighter feels thirsty, they are dehydrated by approximately one liter (IAFC, 2009).
Salt tablets are not to be taken.

Formal Rehabilitation:

- The formal rehabilitation process shall include the following:
- Rest
- Hydration to replace lost body fluids.
- Cooling (Passive and/or active as necessary)
- Warming (Passive and/or active as necessary)
- Medical monitoring for signs/symptoms of stress and vitals.
- Emergency medical care
- Relief from climatic conditions (heat, cold, wind, rain)
- Calorie and electrolyte replacement for activities of 1 hour or more.
- Accountability
- Release

Responsibilities:

Incident Commander:

- Include need for rehabilitation in the initial incident evaluation.
- Establish rehabilitation to reduce adverse physical effects on firefighters while performing strenuous activities during emergency operations and/or training exercises.
- Designate and assign a supervisor to manage rehabilitation.
- Ensure sufficient resources are assigned to rehabilitation.
- Ensure EMS personnel are available for emergency medical care as required.
- Call for Incident Support Unit (ISU) for all second alarms as appropriate.
- Consider assigning an engine company in support of the ISU.

Rehabilitation Unit Leader:

Obtain a list of all companies at the scene and keep the Incident Commander apprised of the condition of emergency personnel. In a more complex incident, the Rehabilitation Unit Leader will report to the Medical Group Supervisor. All companies shall be processed through Rehabilitation before being released.

Select a location for rehabilitation which takes into consideration the following characteristics:

- Large enough to accommodate the number or personnel expected.
- Have an area for removal of personal protective clothing.
- Accessible for ambulance and EMS personnel.
- Removed from hazardous atmospheres including apparatus exhaust fumes, smoke, and other toxins.
- Provide shade in the heat and protection from inclement weather at other times.
- Have access to a water supply (bottled or other) to provide for hydration and active cooling.
- Be away from spectators and the media.
- Shall include a medical monitoring/treatment area.
- Ensure personnel in rehabilitation “dress down” by removing personal protective clothing to promote cooling.

Provide the required resources for rehabilitation:

- Drinking Water for hydration
- Sports drinks and water for incidents more than one hour (Consider drinks with 4-7% carbohydrate solution).
- Active cooling when available.
- Medical monitoring equipment.
- Food when required (incidents longer than 3 hours) and a means to wash hands and face prior to eating.
- Blankets and warm dry clothing if required.
- Washroom facilities if required.
- Document members entering and leaving rehabilitation.
- Time personnel in rehabilitation to ensure that they receive 10 to 20 minutes of rest.

- Ensure personnel rehydrate themselves and are provided with a means to actively cool where required.
- Maintain accountability. Companies reporting to rehab must bring their passport boards with them.
- Request a paramedic field evaluation when it is determined that an individual's vital signs are outside the specified guidelines. If deemed necessary, that person shall be transported to a hospital for further evaluation. No person can be released from rehab for duty if their vital signs fall outside the San Diego County established parameters without further medical evaluation.
- Shall maintain a personnel rehabilitation record for the incident.
- Upon termination of the Rehab assignment, submit the San Diego County Rehabilitation Record to the IC or their designee.

EMS Personnel:

- Report to the Incident Commander or Rehab Unit Leader.
- Identify the EMS personnel requirements.
- Check initial vital signs 10 minutes after firefighters have entered Rehab, monitor for heat stress and signs of medical issues.
- If vital signs or assessment are abnormal, then firefighters will be detained for an additional 10 minutes and have treatment commenced if necessary. Also a paramedic field evaluation may be requested at this point.
- Document medical monitoring.
- Provide emergency medical care and transportation to medical facilities as required.
- Inform the Incident Commander or Rehab Unit Leader when personnel require transportation.
- Document emergency medical care provided.

EMS personnel shall be alert to the following:

- Personnel complaining of chest pain, dizziness, shortness of breath, weakness, nausea, or headache.
- General complaints such as cramps, aches and pains.
- Symptoms of heat or cold related stress.
- Changes in gait, speech or behavior.
- Alertness and orientation to person, place and time.
- Vital signs considered abnormal as established by protocol.

Vital signs must be evaluated in context as there is no evidence or published study indicating when treatment is necessary or type or duration of rehabilitation needed. Vitals may help set parameters for further monitoring, treatment, transport, or release when considered with other factors. It should be anticipated that vitals will be high initially and recovery shall be monitored. If after 30 minutes the vital signs are above the limits, transport to the hospital may be initiated.

Temperature:

Core body temperature provides the most accurate assessment of heat or cold exposure stress. Core temperature of 98.6 to 100.6 is considered normal. Core temp may continue to rise for 20 plus minutes of rehabilitation. Oral thermometers are typically 1 degree lower and Tympanic thermometers are typically 2 degrees lower than core temperature.

Blood Pressure:
Blood Pressure is one of the most frequently measured and least understood vital sign. It has significant potential for error, especially in the noisy and often tumultuous pre-hospital environment. Members of various ethnic and racial groups respond very differently to physiological stress and their B/P is also affected by a variety of stimuli both internal and external. For these reasons the San Diego County agencies chose not to measure blood pressure of members during rehab, but will continue to use as an assessment tool for any crew member that is symptomatic.

Pulse:

Normal resting heart rate or pulse in an adult ranges from 60 to 100 beats per minute. With exertion, heart rates should increase and frequently exceed 100 per minute. It is extremely important to interpret heart rate in context of the individual. After resting for a period of time, heart rate should return to near normal resting rates. The most important aspect of heart rate assessment in rehab is recovery.

Respirations:
Normal adult respiratory rate ranges from 12 to 20 breaths per minute. Firefighters entering rehab will, in all likelihood, exhibit higher than normal respiratory rates as a normal response to stress and increased body temperature. Respiratory rates should fall within normal range before a firefighter is cleared to leave rehab.

Carbon Monoxide:

< 15 %: observe for any headache or shortness of breath.
> 15%: Treat with high flow O2 via non-rebreather Mask or CPAP (if available)
> 20%: Commence CPAP treatment and transport.

** IAFC states “any firefighter with a COHb level above 15% should be placed on high-flow oxygen and receive further evaluation”.

Company Officers:

- Responsible to assess their crew during the initial 30 minute air bottle exchange or 20 minutes of strenuous work.
- Be familiar with the signs and symptoms of heat stress and cold stress.
- Monitor their company members for signs of heat stress and cold stress.
- Notify the IC when stressed members require relief, rotation or reassignment according to conditions.
- Report immediately to rehabilitation when so directed.
- Provide access to rehab for company members as needed.

- Ensure that their company is properly checked in with the rehab unit leader and that the company remains intact.
- In the case of a wildland incident, document rehabilitation procedures on an ICS-214. In the case of a first alarm structure fire, document rehabilitation procedures in the department's RMS as appropriate.

Crew Members:

- Be familiar with the signs and symptoms of heat stress and cold stress.
- Monitor their company members for signs and of heat stress and cold stress.
- Inform their company officers when members require rehabilitation and/or relief from assigned duties.
- Maintain unit integrity.

Reference:

This policy is based on NFPA 1584 (Standard on Rehabilitation of Members during Emergency Operations and Training Exercises, 2008 Edition and IAFC Rehabilitation and Medical Monitoring, A Guide for Best Practices, 2009). The standard mandates that all departments, regardless of geography or incident type, prepare a rehabilitation program that maximizes safety practices.

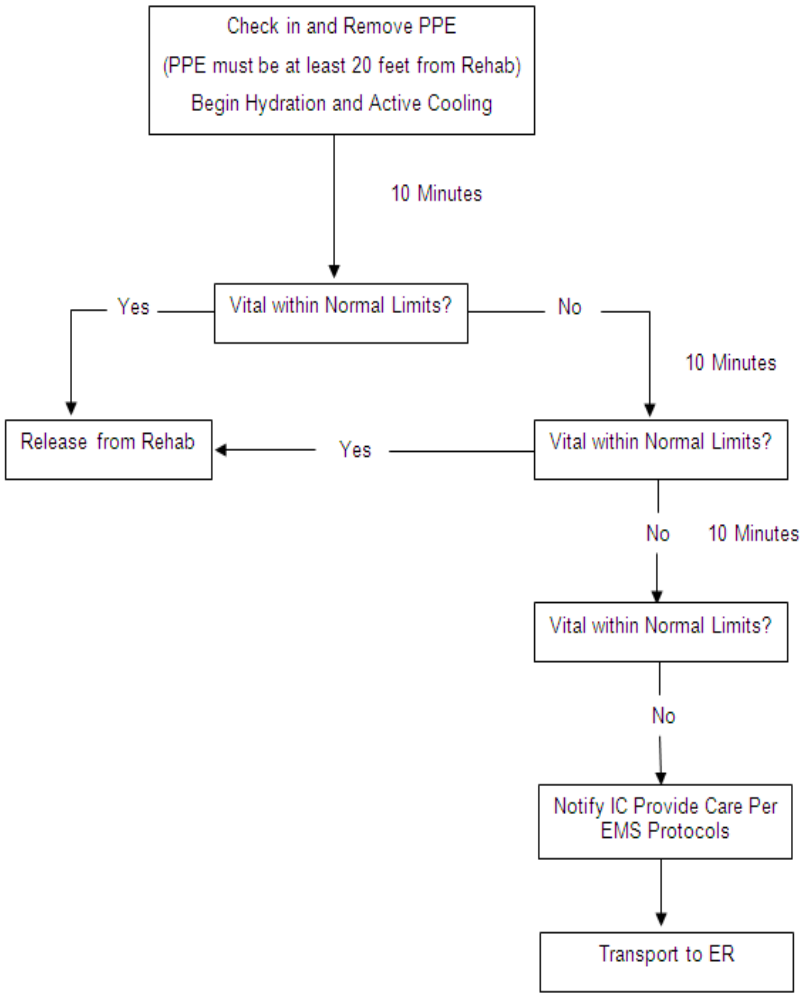
Emergency Rehabilitation Guidelines:

When a person arrives at rehab with no significant complaints

1. Encourage the person to doff protective gear.
2. (PPE must be at least 20 feet from Rehab)
3. Encourage the person to drink at least 8 ounces of fluid.
4. All Crews rest for 10 minutes prior to initial vitals.
   BUT If any person exhibits any signs of heat exhaustion or fatigue, take their vital signs immediately.
5. If any vital sign is outside listed parameters the person shall rest for
6. a further of 10 minutes with continued oral hydration and active cooling (wet towels).
7. If vital signs return to within the parameters, the person may be released for duty.
8. If vitals remain outside parameters after 30 minutes, transport to the hospital should be initiated.

When a person arrives at rehab with a chief complaint:

1. Chest pain, SOB, altered mental status or irregular pulse follow the appropriate protocol. This person may not return to duty.
2. A PCR should be written on any person requiring medical treatment and/or transport.
3. During extremes of temperature, consider heat exhaustion/stroke: fainting, profuse sweating, ashen pallor, nausea, vomiting. Consider carbon monoxide poisoning during prolonged exposure to smoke.



SDOPS REHABILITATION RECORD

Date:____/____/________ Inc#_________________ Incident Name:________________ Page ________of ________

TIME IN	NAME/ENGINE	*10 Minute Vitals*			*20 Minute Vitals (if needed)*			Chief Complaint YES/NO	TIME OUT
		Resp Rate: Temp	Pulse	CO level	Resp Rate: Temp	Pulse	CO level		
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VITAL SIGN PARAMETERS:
Temp: 98.6-100.6
Respirations: Between 8-24
Heart Rate: Between 50-100
CO level (*if available*)

CARBON MONOXIDE PARAMETERS:
<15% Headache? SOB?
>15% High Flow 02
>20% High Flow 02 or CPAP and Transport.

____
Incident Commander

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Rehabilitation Unit Leader