S.O.P. #: TACTICAL OPERATIONS MANUAL #15
SUBJECT: Firefighter Decontamination and Rehabilitation Policy
DIVISION: EMERGENCY OPERATIONS

Objective: To establish guidelines that provide for the decontamination of firefighting personnel after a fire and ensure the safety and health of all members through on-scene medical rehabilitation.

Section 1: Firefighter Decontamination

A. Studies show that firefighters are at increased risk of certain types of cancer as a result of occupational exposure. Training, proper use of PPE/SCBA, and decontamination (DECON) are all effective means to reduce occupational cancer risk.

B. While DECON is the responsibility of each individual member, Company Officers shall ensure compliance with this S.O.P. to protect personnel under their command. This includes:

1. Providing the opportunity for members to shower as soon as possible following an incident.
2. Reporting to Fire Supply to obtain loaner or replacement PPE.
3. Ensuring the apparatus cab and SCBA are adequately cleaned after an incident.

C. Wet-soap decontamination of PPE/SCBA is the most effective method in reducing PAH (polycyclic aromatic hydrocarbon) exposure on the fireground. Dry brush decontamination is less effective but may be appropriate on the fireground in situations of inclement weather. Wet-soap DECON can be delayed until returning to the station when necessary.

1. All engine companies shall carry a DECON Kit comprised of the following:
   a. 5-gallon bucket (black)
   b. Wheel/hand brush
   c. Dish detergent
   d. Garden hose w/nozzle
   e. 1 ½" to garden hose reducer
   f. DECON wet wipes
   g. Trash bags

D. Wet-Soap DECON Procedure for Turnout Gear

1. DECON shall take place away from the fire building and upwind from smoke.
2. A portable PPV fan shall be set up in an area away from apparatus exhaust.
3. The FADO shall connect and supply the low-pressure garden hose and nozzle from a clean water source away from the apparatus exhaust (do not exceed 10-15 PSI).
4. The member assisting with DECON shall don medical gloves and eye protection.
5. Using a minimum amount of dish detergent (use 1 oz. or less), the member shall fill the bucket half-way with water.
6. The firefighter will remain on air and in full PPE during the DECON process.
7. The assisting member will scrub soiled areas of PPE using the concentration in the bucket and the scrub brush.
8. The assisting member will rinse with the garden hose, ensuring any loose fire debris is rinsed away. **Enough water should be used to be effective without fully saturating PPE; use the least amount as possible to remove soap from the gear**. Do NOT spray the head or neck areas.
9. Stand in front of the PPV fan to blow any excess water or debris off of turnout gear.
10. Doff gloves, helmet, hood and face piece using UL-IFSI recommended practices whenever possible:
    a. Procedure for gloves (link)
    b. Procedure for hood & face piece (link)
11. Heavily soiled PPE or PPE that cannot be effectively cleaned using this method should be placed in a trash bag and transported to Fire Supply for cleaning/replacement and loaner gear obtained as soon as practical. The bag will be tagged externally with a green PPE Inspection Cleaning Repair Tag.

E. Dry-Brush DECON Procedure for Turnout Gear

1. DECON shall take place away from the fire building and upwind from smoke.
2. The member assisting with DECON shall don medical gloves and eye protection.
3. The firefighter will remain on air and in full PPE during the DECON process.
4. Using a brush, the assisting member will remove loose fire debris from turnout gear.
5. Doff gloves, helmet, hood and face piece using UL-IFSI recommended practices whenever possible:
    a. Procedure for gloves (link)
    b. Procedure for hood & face piece (link)
6. Heavily soiled PPE or PPE that cannot be effectively cleaned using this method should be cleaned using the Wet-DECON procedure.
7. Heavily soiled PPE or PPE that cannot be effectively cleaned using the Wet-DECON method should be placed in a trash bag and transported to Fire Supply for cleaning/replacement and loaner gear obtained as soon as practical. The bag will be tagged externally with a green PPE Inspection Cleaning Repair Tag.

F. DECON skin wipes reduce PAH exposure levels by as much as 54% when used on areas of the skin known to have a high absorption rate (scalp, forehead, jaw angle, and groin). Wipes should be used to clean these areas of the skin immediately following the DECON of PPE following these steps:

1. Remove turnout coat.
2. Remove wipe carefully from package as not to contaminate more than one wipe at a time.
3. Wipe eyelids and external corners around your eyes.
4. Clean hands, lips and surrounding skin BEFORE hydrating.
5. Clean inside and around the folds of your nose.
6. Clean inside and around the back of your ears.
7. Wipe entire neck and beneath the collar area of your shirt.
8. Wipe down your scalp/hair. Brush hair with fingers to remove any loose debris.
9. Clean your arms and hands and remove any visible soot from your skin.
10. Blow your nose into the wipe & properly dispose of the used wipe(s) in a trash bag/container.
11. All trash shall be discarded into a trash bag, sealed and transported to the fire station for disposal by normal means.

G. Firefighting hoods shall be laundered following exposure to fire smoke or other products of combustion. Issued spare hoods should be used until laundering is complete.

1. Hoods shall be washed per manufacturer recommendations.
2. Wash hoods in separate loads according to job functions on the fireground to avoid cross-contamination of hoods (i.e. interior attack crew hoods may be soiled more than outside-vent crew hoods).
3. Inspect hoods after laundering and replace following proper procedures as necessary.

H. Firefighting helmets shall be thoroughly cleaned inside and out with rags or a scrub brush using a concentration of water and dish soap as necessary. A DECON wipe may be used to wipe the interior components of the helmet on the scene. Removable ear flaps and sweat bands should be laundered separately from firefighting hoods as soon as practical.

Section 2: Pre-Response Habit (PREHAB) Considerations

A. All members must be cognizant of the fact that proper hydration prior to an emergency incident will better help the body prepare for the physical demands which come with firefighting. The nature of emergency responses does not afford the benefit of knowing when an emergency may occur; therefore, it is necessary that members are adequately prepared at all times.

B. Members should begin PREHAB activities at least four (4) hours prior to reporting for duty, when feasible. Additionally, members should continue to PREHAB during their shift. This includes:
    a. Ensure that all personnel are physically and mentally prepared to complete a safe tour of duty.
    b. Ensuring adequate rest and recovery from other activities.

c. Begin pre-hydrating by slowly drinking one (1) ounce of water for every ten (10) pounds of body weight at least four (4) hours prior. Members who will be reporting for duty in the morning should begin to hydrate the evening prior. Members should monitor their urine for hydration status; dark/highly concentrated urine indicates dehydration.
d. Ensure the body is properly nourished with electrolytes and carbohydrates.
e. Avoiding excessive amounts of caffeinated beverages while on duty. Caffeinated beverages cause increased urination and make it more difficult to maintain adequate hydration.
f. If performing strenuous activities while on duty (i.e. physical training, practical training exercises), drink adequate fluids following these activities to restore hydration levels.
g. Excessive amounts of alcohol used within the previous 24 hours often causes dehydration. All personnel must remain compliant with Personnel 24.

C. Consider extremes in weather conditions, such as extreme heat or cold (See Appendix A). Ensure all personnel are aware of the potential effects of these situations on the body.

D. Members are encouraged to periodically obtain a resting set of baseline vitals to monitor their overall health status and serve as a reference during fireground rehabilitation efforts.

Section 3: On-Scene Rehabilitation

A. Concept of Rehabilitation

1. On-scene incident rehabilitation is not a punitive activity. It is a necessary function to ensure the health, wellness, and safety of all members. Firefighting is an extreme athletic activity and it is important that members are monitored to ensure their overall preparedness for optimal performance. The goal of REHAB is to provide an opportunity for members to rest and recover so that they may re-engage in operations. In the event that a condition is found which may preclude further operations of a member, the Incident Commander, on-scene Safety Officer and/or on-call Safety Officer should be consulted for further direction.

B. Responsibilities of the Incident Commander

1. A REHAB group will be established for any ongoing or physically demanding incidents and when operating in extreme temperatures. REHAB is mandatory for any working incident.
2. Request additional resources early in the incident to ensure adequate provisions are available for all members operating at the scene.
3. Designate a Rehab Group Supervisor who will ensure compliance with this S.O.P. The Medical Group Supervisor will assume this duty if none is appointed by the I.C.
4. If one or more crew members are exposed to serious injuries or fatalities during the incident, ensure that the remainder of that crew is relieved of their emergency responsibilities at the incident as soon as possible.
5. Request CISM/Peer Support Team and/or other mental health resources when necessary.

C. Responsibilities of the Company Officer

1. Maintain awareness of the physical and mental conditions of each member operating within their span of control. Ensure all members of the crew report to REHAB
2. Continually assess your crew at a minimum of every 45 minutes and more frequently when working in extreme conditions to determine the need for rehab.
3. Ensure crew members remain hydrated.

D. Responsibilities of the REHAB Group Supervisor

1. Designate a safe area, out of public view, where personnel can sit down to rest that is well-removed from fireground smoke, equipment exhaust, firefighter DECON, view of the incident, and other scene hazards. The location shall be communicated to the I.C. (Appendix B).
2. Request additional resources (i.e. EMS transport unit(s), REHAB Unit) through the I.C.
3. Ensure members receive a medical assessment prior to being released from rehab for reassignment.
4. Document required information on the Form 365, Incident Rehabilitation Group Documentation Form (Appendix C).

5. Ensure the completed Form 365 is submitted to fire-safety@baltimorecountymd.gov within 24 hours of the incident. All members who enter REHAB must be documented on the form; use additional forms as necessary.
6. Members who require a medical assessment or care as of a result of a chief complaint or pertinent sign or symptom shall be documented through the eMEDS patient care reporting system, with a refusal obtained if not transported.

E. General Rehabilitation Criteria

1. Members shall report to REHAB following the depletion of one (1) 45-minute SCBA cylinder or after 40 minutes of intense work without SCBA. During this initial visit, members shall remain in REHAB for a minimum of ten (10) minutes.

2. Members shall report to REHAB for each subsequent depletion of one (1) 45-minute SCBA cylinder or after 40 minutes of intense work without SCBA. Subsequent visits require the member to remain in REHAB for a minimum of twenty (20) minutes.

3. The Incident Commander or on-scene Safety Officer may adjust the timeframes depending on work and/or environmental conditions. Consider Appendix A.

4. The Incident Commander and/or REHAB Group Supervisor should consider the use of large climate-controlled vehicles to provide a warm or cool environment (i.e. REHAB Units, DECON Unit, medic units, buses). Members shall undergo DECON prior to entry into these areas.

5. While in REHAB, members shall focus on the following:
   a. Ensuring adequate rehydration (fluid replacement).
   b. Active and/or passive cooling or warming as needed.
   c. Calorie and electrolyte replacement for longer duration incidents.

6. The ALS unit on the scene should not be utilized to transport stable members requiring further medical evaluation or treatment. An additional transport unit should be requested. The REHAB Group Supervisor should consult the I.C. to deviate from this practice and utilize an on-scene resource.

F. Medical Criteria for Release from REHAB

1. Unless exhibiting signs or symptoms, members should be afforded the full REHAB period (10 or 20 minutes, as appropriate) before obtaining vital signs. This allows the member to focus on physiological needs and provides an opportunity for the body to recover.

2. The following vital signs shall be obtained and documented for all members in REHAB:
   a. Blood pressure
   b. Pulse
   c. Respiratory rate
   d. Pulse oximetry
      i. REHAB Group personnel should be aware of the potential for false readings as carbon monoxide has 210 times greater affinity for hemoglobin than oxygen.
   e. Carboxyhemoglobin (SpCO) shall be obtained for members who are exposed to smoke without SCBA and/or when a false pulse oximetry reading is suspected. Carboxyhemoglobin monitoring is available on the EMS Supervisor Lifepak 15 devices.
      i. Members are reminded that wearing SCBA is required during all interior firefighting operations, to include active overhaul activities.

3. Following the rest period, the member shall have their vital signs obtained, as above.
   a. Members who have a systolic blood pressure (SBP) less than 160 mmHg, a diastolic blood pressure (DBP) less than 100 mmHg, and a pulse rate (P) of less than 120 BPM may be cleared to return to fireground operations.
   b. Members who do not meet the vital sign criteria will remain in REHAB for an additional 10 minutes.
   c. Following the additional rest period, members who have a SBP<160, a DBP<100, and P<100 may be cleared to return to fireground operations.

i. If a member does not meet these criteria, the REHAB Group Supervisor shall consult with the on-scene Safety Officer and Incident Commander to determine subsequent actions. The I.C. should notify the on-call Safety Officer (if not already on-scene) to assist.

ii. An overall, comprehensive medical assessment of the member must be utilized to guide a transport decision. It is not practical to list objective criteria which would automatically target a transport decision in these circumstances. If in doubt, transport the member to an appropriate medical facility.

4. Members shall not return to operations if they do not feel adequately rested or if REHAB personnel find evidence of medical, psychological, or emotional distress.

G. Post-Incident Activities and Rehabilitation

1. All members should ensure they monitor their personal well-being and hydration status following any incident which requires strenuous activity.

2. Officers will monitor their personnel to ensure their mental health and well-being following any incident. Where necessary, consider the Critical Incident Stress Management/ Peer Support Team.

3. REHAB Group Supervisors must ensure that all copies of the Form 365 are sent to fire-safety@baltimorecountymd.gov with the subject line "REHAB-CC" (e.g. REHAB-212345678) within 24 hours following the conclusion of the incident. The original, handwritten form may be scanned and sent or the information may be transposed electronically.

APPENDIX A

ADDITIONAL CONSIDERATIONS FOR OPERATIONS IN ENVIRONMENTAL CONDITIONS

Section 1: Operating in Hot Environments

A. Utilize the Heat Stress Index to assist in guiding operational rehabilitation decisions. The chart below factors together ambient air temperature and relative humidity to determine humiture, (known as the heat index). Members operating in these conditions should primarily focus on hydration and cooling.

HEAT INDEX (HUMITURE)

Temperature ° F	Relative Humidity 10%	20%	30%	40%	50%	60%	70%	80%	90%
104	98	104	110	120	132				
102	97	101	108	117	125				
100	95	99	105	110	120	132			
98	93	97	101	106	110	125			
96	91	95	98	104	108	120	128		
94	89	93	95	100	105	111	122		
92	87	90	92	96	100	106	115	122	
90	85	88	90	92	96	100	106	114	122
88	82	86	87	89	93	95	100	106	115
86	80	84	85	87	90	92	96	100	109
84	78	81	83	85	86	89	91	95	99
82	77	79	80	81	84	86	89	91	95
80	75	77	78	79	81	83	85	86	89
78	72	75	77	78	79	80	81	83	85
76	70	72	75	76	77	77	77	78	79
74	68	70	73	74	75	75	75	76	77

WORK/REST HYDRATION FOR FIREGROUND ACTIVITIES

Note: Add 10°F when protective clothing is worn and add 10°F when in direct sunlight.

Heat Category	Heat Index (°F)	Work/Rest (Minutes)	Water Intake (qt/hr)
Extreme	115+	10/50	1
High	103-114	20/40	1
Moderate	91-102	30/30	1
Low	82-90	30/30	1
Minimal	78-81	40/20	¾

Hourly fluid intake should not exceed 1.5 qts./hr.; daily intake should not exceed 12 qts.

Section 2: Operating in Cold Environments

A. Utilize the Wind Chill Danger Zone Index to assist in guiding operational rehabilitation decisions. The chart illustrates how long it will take for exposed skin to freeze (in minutes), given an ambient air temperature and wind speed. Members operating in these conditions should be cautious during REHAB activities to prevent freezing. Members are reminded that they can still become dehydrated, even in cold environments.

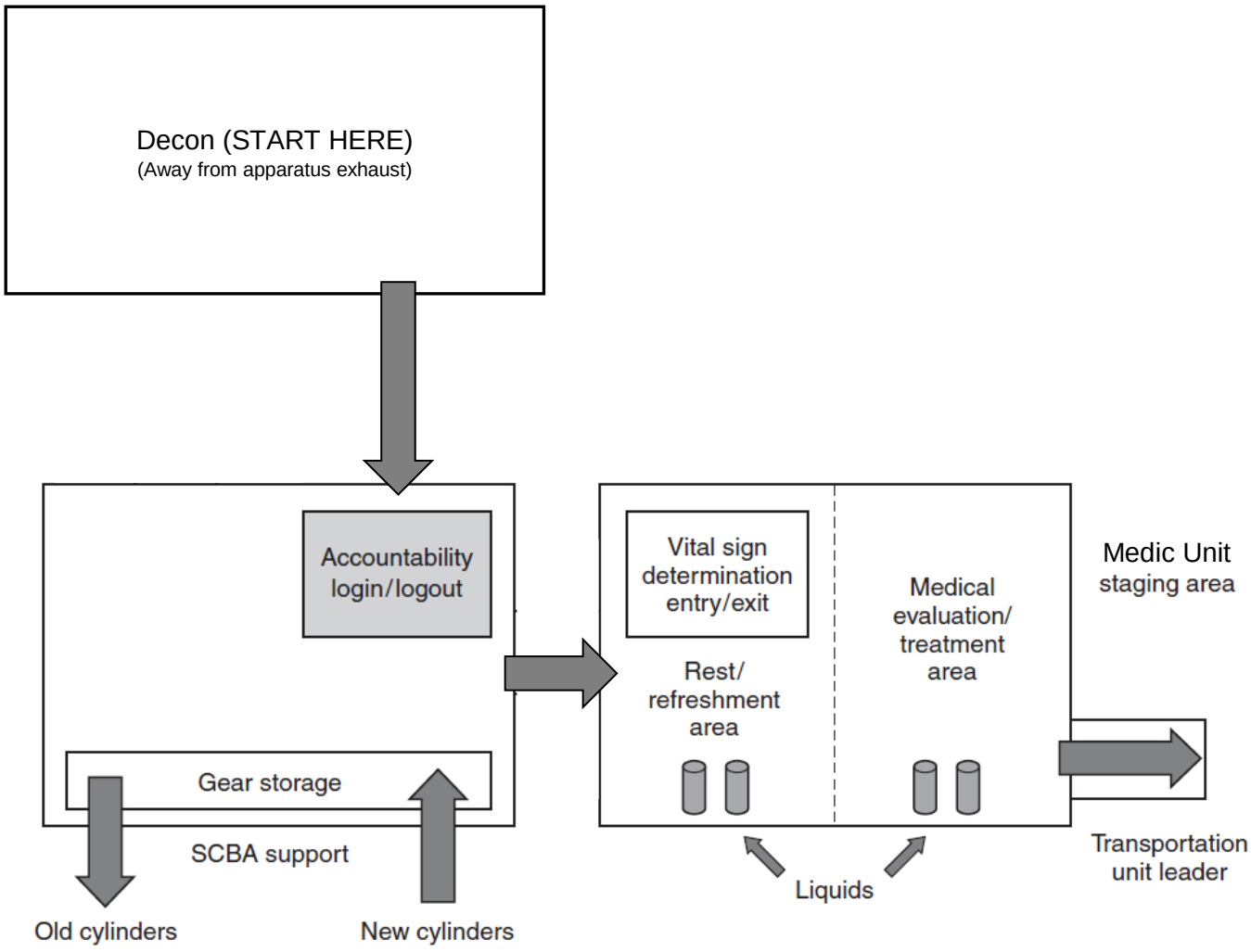
WIND CHILL DANGER ZONE INDEX – TIME FOR EXPOSED SKIN TO FREEZE (MINS.)

Wind Speed (mph)	Air Temperature (° F) 10	5	0	-5	-10	-15	-20
5	>120	>120	>120	>120	31	22	17
10	>120	>120	>120	28	19	15	12
15	>120	>120	33	20	15	12	9
20	>120	>120	23	16	12	9	8
25	>120	42	19	13	10	8	7
30	>120	28	16	12	9	7	6
35	>120	23	14	10	8	6	5
40	>120	20	13	9	7	6	5
45	>120	18	12	8	7	5	4
50	>120	16	11	8	6	5	4

These graphics adapted from information in the U.S. Fire Administration's publication Emergency Incident Rehabilitation (February 2008).

APPENDIX B

DECONTAMINATION AND REHABILITATION CONCEPTUAL LAYOUT



APPENDIX C – INCIDENT REHABILITATION GROUP DOCUMENTATION FORM (FORM 365)

BALTIMORE COUNTY FIRE DEPARTMENT
Incident Rehabilitation Group Documentation Form

Incident Date: | **Incident Location:** | **Incident Number:** | **Page** of

Type of Incident: ☐ Fire ☐ Rescue ☐ Hazmat ☐ Other:

Incident Commander: | **Safety Officer:** | **Rehab Group Supervisor:**

Units on Scene:

REMEMBER!
1st rehab = 10 mins. / 2nd rehab = 20 mins.

Unless ex[illegible] S/S, measure on EXIT after initial re[illegible]eriod:

[illegible] P<160, DBP<100, an[illegible] <120? = CLEAR
Otherwise HOLD [illegible] onal 10 minutes.

Fo[illegible] additional [illegible] utes, reassess vital sign[illegible]

(2) SBP[illegible] BP<100, and P<100? = CLEAR
Othe[illegible]se NOTIFY on-scene Safety Officer

Firefighter's Name *(Last, F.I.)*	Unit	Rehab In Time	Rehab Out Time	Vital Signs Time	Blood Pressure	Pulse	Resp	SpO2	[illegible]	Disposition
										☐ Cleared for duty ☐ Hold in rehab for monitoring ☐ Transported to/via:
										☐ Cleared for duty ☐ Hold in rehab for monitoring ☐ Transported to/via:
										☐ Cleared for duty ☐ Hold in rehab for monitoring ☐ Transported to/via:
										☐ Cleared for duty ☐ Hold in rehab for monitoring ☐ Transported to/via:
										☐ Cleared for duty ☐ Hold in rehab for monitoring ☐ Transported to/via:
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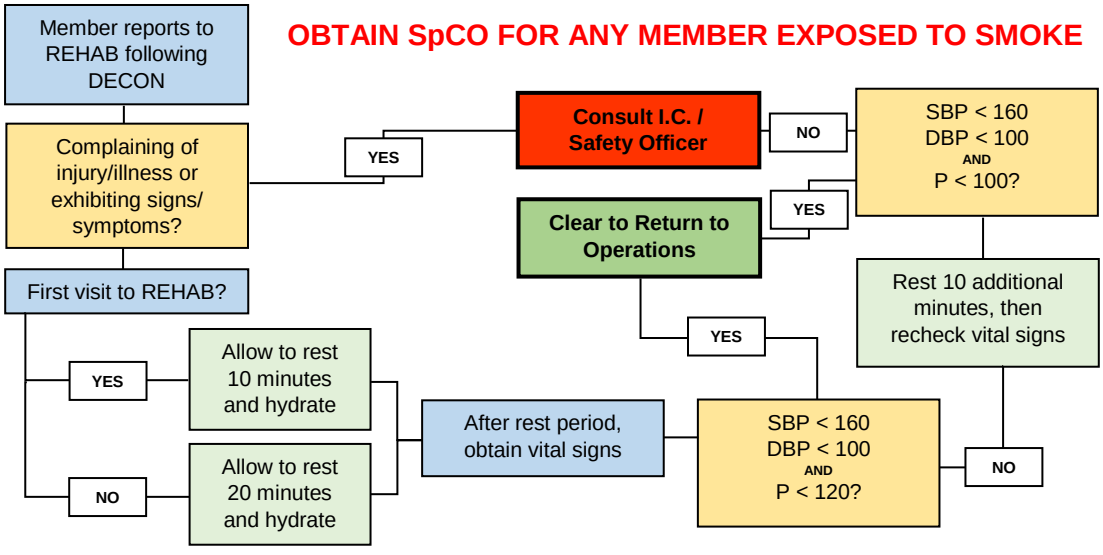
										☐ Cleared for duty ☐ Hold in rehab for monitoring ☐ Transported to/via:
										☐ Cleared for duty ☐ Hold in rehab for monitoring ☐ Transported to/via:

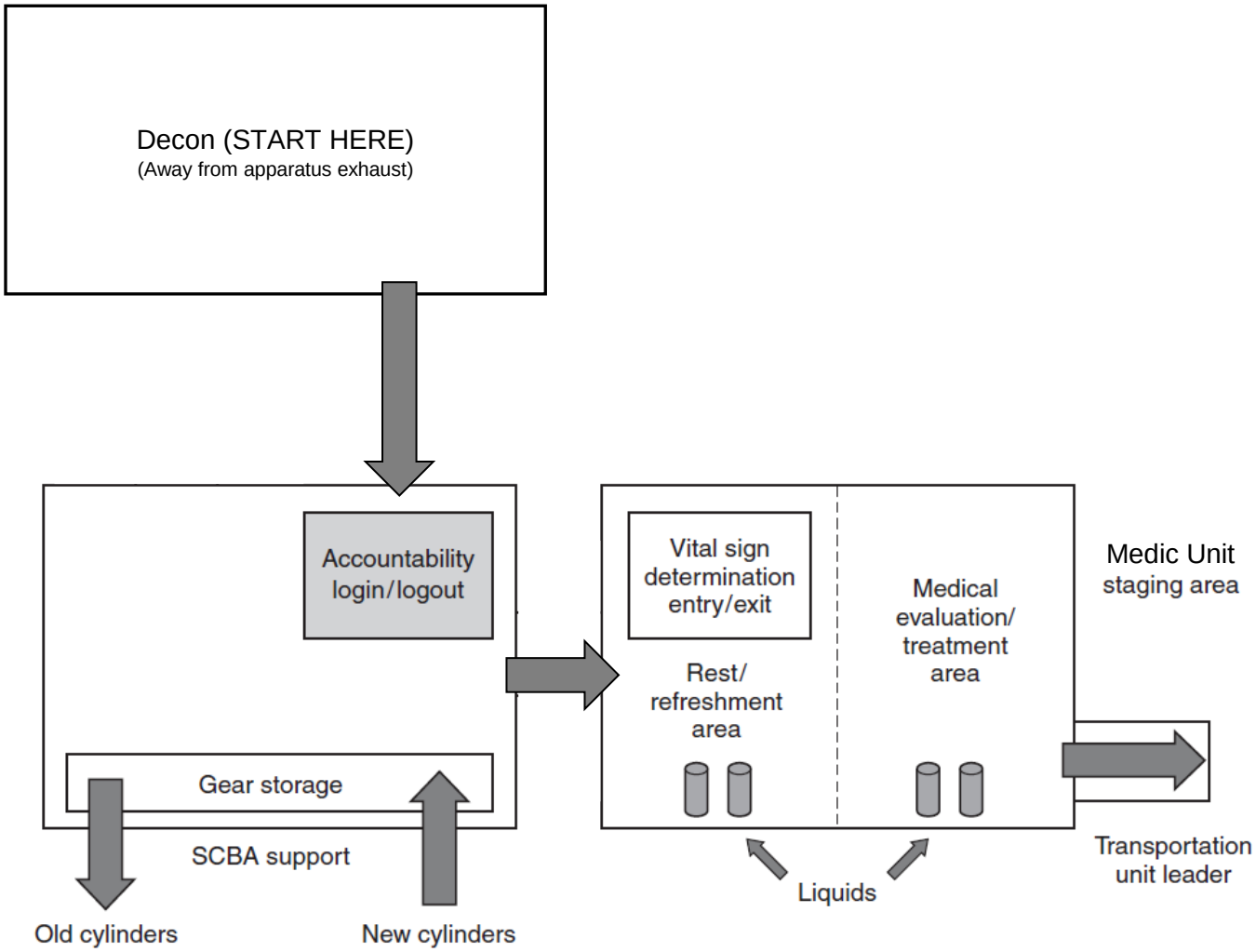
E-Mail completed form to fire-safety@baltimorecountymd.gov with subject line REHAB-CC (*REHAB-212345678*)

Form 365 (Revised 6/21)

APPENDIX D

INCIDENT DECONTAMINATION AND REHABILITATION TACTICAL CARD

Action Guide	Initial Tactical Considerations
Incident Commander	❑ Ensure DECON and REHAB areas are set up for any ongoing or physically demanding incident and when operating in extreme temperatures. REHAB mandatory for any working incident. ❑ Request additional resources early. Consider REHAB Units, DECON Unit, Medic Units, and/or buses for climate-controlled environments. ❑ Designate REHAB Group Supervisor. Medical Group Supervisor assumes duty if none specifically appointed. ❑ If members are exposed to serious injuries or fatalities, ensure that the remainder of the crew is relieved of emergency responsibilities as soon as possible. ❑ Request CISM/Peer Support Team or other mental health resources when necessary.
All Company Officers	❑ Maintain awareness of physical and mental conditions of each member. ❑ Continually assess crew every 45 minutes; more frequently when working in extreme conditions. Report to REHAB as necessary. ❑ Ensure all members remain hydrated. ❑ Ensure all members of crew report to REHAB following exhaustion of ONE SCBA cylinder or 40 minutes of intense work without SCBA.
REHAB Group Supervisor	❑ Designate safe area, out of public view, where personnel can sit down to rest. Area should be well-removed from smoke, equipment exhaust, DECON area, and other scene hazards. ❑ Communicate establishment and location of REHAB unit ❑ Request additional resources (transport unit(s), REHAB Unit, etc.) through I.C. ❑ Be alert for members who may require further medical intervention. ❑ Ensure each member receives medical assessment and document required information on Form 365 prior to leaving REHAB. ❑ Members who require a medical assessment or care as a result of reporting a chief complaint or presenting with sign/symptom should have eMEDS generated. ❑ Consult with on-scene/on-call Safety Officer with any questions.
REHAB Medical Monitoring Flow	



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100	95	99	105	110	**120**	**132**			
98	93	97	101	106	110	**125**			
96	91	95	98	104	108	**120**	**128**		
94	89	93	95	100	105	111	**122**		
92	87	90	92	96	100	106	**115**	**122**	
90	85	88	90	92	96	100	106	114	**122**
88	82	86	87	89	93	95	100	106	**115**
86	80	84	85	87	90	92	96	100	109
84	78	81	83	85	86	89	91	95	99
82	77	79	80	81	84	86	89	91	95
80	75	77	78	79	81	83	85	86	89
78	72	75	77	78	79	80	81	83	85
76	70	72	75	76	77	77	77	78	79
74	68	70	73	74	75	75	75	76	77

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