Incident Rehabilitation on Scene
Are We Doing Enough?

Lee Shaffer
Asst. Chief of Special Operations
Kirtland AFB Fire Emergency Services
INTRODUCTION

• Approximately one-half of all firefighter fatalities and significant percentage of injuries are a result of stress and overexertion on firefighters involved in emergency operations and training exercises.

• Purpose of rehab operations is to provide rest for firefighters and receive medical attention and monitoring as required and given the opportunity to replenish fluids.
# INJURY STATISTICS

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INJURY STATISTICS

• Individual Factors
  – Health
  – Age and experience
  – Fitness levels
  – Illness
  – Medication to include over the counter
INJURY STATISTICS

• Leadership Factors
  – Little or no rehab
  – Rehab called out too late
  – Lack of Safety Officer
  – Lack of EMS
  – Lack of accountability
  – Lack of communication
CONTRIBUTING FACTORS

• Thermal Stress
  – Environmental heat and cold

• Working environment
  – Interior/exterior fire conditions
  – Labor intensive
  – We have no choice

• PPE
  – A double edged sword
WHAT HAPPENED?

• 2004, triennial exercise – not available.
• 2007, triennial exercise – very little rehab.
• 2010, triennial exercise – rehab was requested but was too late.
• 2013, triennial exercise – rehab was a big improvement but needs minor adjustment.
• Found issues with past emergencies and exercises
HOW TO FIX THIS PROBLEM

• Fact finding
• SOGs/SOPs review
• Researched websites and publications
• How do other departments do business
• Brain storming
• Educating our people
• Pre-incident planning
• Evaluate
FACT FINDING

• Review past exercises and incidents
  – Did we have rehab
  – Was it adequate
  – What went wrong
  – What went right

• Review past rehab incidents
  – Accountability
  – Any injuries
SOG/SOP REVIEW

• Looked at our own and mutual aid partners
  – Out-of-date, restricted, and/or vague
• Looked at other responding organization, academies, and fire schools
  – Some were better
  – Some were not so great
• Checked NFPA, and FEMA
WEBSITES AND PUBLICATION

• Google is my friend
• Publications
  – NFPA, FEMA, OSHA, and IAFF
  – NIOSH reports
• How others are doing business
• Equipment
HOW OTHER DEPTS. DO BUSINESS

• Contacted other departments
  – Lot of good ideas
  – Also some were in the same boat or even worse
• What type of equipment
• Where do you conduct rehab
• Time frame
• Who is in charge
BRAIN STORMING

• Equipment – who had what
  – Alb. has the toilet facilities, BernCo has access to canteen, we have shower system
  – What equipment is a must and nice to have

• What other agencies are involved
  – Red Cross, food pantries, canteens, retail stores

• Different times of the year

• Possible incident locations
EDUCATING OUR PEOPLE

• Did not know what rehab was really about
  – For people who are weak or don’t want to work
  – Free to enter and exit when they wanted

• Once they knew about rehab
  – Better understanding
  – Understanding laws and regulations
  – Understanding the risk
  – Better control on signs and symptoms of stress
PRE-INCIDENT PLANNING

- Possible incident sites
- Time of year and type of equipment
- How many first and emergency responders
- How are you going to resupply your rehab unit
- What is the time frame to resupply your rehab unit
- Who is going to manage your unit and do they understand your requirements
EVALUATION

• Ongoing
• Identify what went right and what needs improvement
• Should be part of the critique process
• Not to place blame if there was a problem
CHANGES and UPDATES

• SOP/SOG updates
• Weather information
• Equipment
• Operation
SOP/SOG UPDATES

- Aligned with responding partners and mutual aid agencies
- Update and ensured compliance
- Educate all first and emergency responders
WEATHER INFORMATION

• This plays a big part in rehab
• Weather is taken onsite of incident
• Bio-Environmental tasked for wet bulb, but FD personnel are trained in taking weather
• Several tools to take or “sling” weather
WEATHER INFORMATION

• Different weather meters available
• Some are specific such as lightning detection
• Some are multi-specific that can read temp, wind, Rh%, Barometer, and more
• Available in electronic and manual
### WEATHER INFORMATION

**Heat Index (Apparent Temperature)**

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**With Prolonged Exposure and/or Physical Activity**

- **Extreme Danger**: Heat stroke or sunstroke highly likely
- **Danger**: Sunstroke, muscle cramps, and/or heat exhaustion likely
- **Extreme Caution**: Sunstroke, muscle cramps, and/or heat exhaustion possible
- **Caution**: Fatigue possible
WEATHER INFORMATION

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<thead>
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<th>Likelihood of Heat Disorders with Prolonged Exposure or Strenuous Activity</th>
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<td><strong>Caution</strong></td>
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<td>80 – 90F</td>
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<td>90 – 105F</td>
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<tr>
<td>105 – 130F</td>
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<td>130F or higher</td>
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**Special Considerations**

- Working in direct sunlight = Add 10 F
- Wearing full PPE (with or without SCBA) = Add 10 F

**Example**

- *Air Temperature 82F with Rh of 85% = Heat Index of 90F*
- *Personnel working in direct sunlight = Add 10 F*
- *Personnel working in full PPE = Add 10 F*

90F + 10F + 10F = 110 F Final Heat Index which is in the **DANGER** Category
## WEATHER INFORMATION

### WORK CYCLES

<table>
<thead>
<tr>
<th>Adjusted Temperature</th>
<th>For workers with normal work clothes, conduct monitoring</th>
<th>For workers wearing impermeable protective clothing conduct monitoring</th>
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<tbody>
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<td>90°F or above</td>
<td>After each 45 minutes of work</td>
<td>After each 15 minutes of work</td>
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<td>87.5°-90°F</td>
<td>After each 60 minutes of work</td>
<td>After each 30 minutes of work</td>
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<td>82.5°-87.5°F</td>
<td>After each 90 minutes of work</td>
<td>After each 60 minutes of work</td>
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<td>77.5°-82.5°F</td>
<td>After each 120 minutes of work</td>
<td>After each 90 minutes of work</td>
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<td>72.5°-77.5°F</td>
<td>After each 150 minutes of work</td>
<td>After each 120 minutes of work</td>
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WEATHER INFORMATION

NWS Windchill Chart

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Frostbite Times
- Light blue = 30 minutes
- Medium blue = 10 minutes
- Dark blue = 5 minutes

Wind Chill (°F) = 35.74 + 0.6215T - 35.75(V^{0.16}) + 0.4275T(V^{0.16})
Where, T = Air Temperature (°F)  V = Wind Speed (mph)

Effective 11/01/01
## WEATHER INFORMATION

### WIND CHILL INDEX

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<tr>
<th>Wind Chill Temperature</th>
<th>Danger</th>
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<td>Above 25 °F (-3.9 °C)</td>
<td>Little danger for properly clothed person</td>
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<tr>
<td>25 to -75 °F (-3.9 to -59.4 °C)</td>
<td>Increasing danger; flesh may freeze</td>
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<td>Below -75 °F (-59.4 °C)</td>
<td>Great danger; flesh may freeze in 30 seconds</td>
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EQUIPMENT

• What is required vs. what is nice to have
• Ensure compliance
• Electric power and gas power
• Checked with mutual aid partners and response agencies
• Outside agencies
EQUIPMENT

- Blowers and misting fans
- Coolers
- Portable canopies and blow up tents
- Tables and chairs
- Trash cans
- Emersion chair and towels
- Heaters
- Generator
- Trailer(s)
EQUIPMENT

- Portable water tanks
- Toilet facilities
- Shower system
- Buses
OPS - IN/OUT PROCEDURES

- Local EMS or MDG is in charge of EMS
- Safety Officer oversees operation
- A form of rehab is established for all exercises and incidents
- All major exercises or incidents lasting more than 2 hours will require formal rehab
- All personnel must go through rehab when established
## OPS - IN/OUT PROCEDURES

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<th>Time In</th>
<th>Time Out</th>
<th>Unit or Name</th>
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### OPS - IN/OUT PROCEDURES

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<thead>
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<th>NAME (LAST, FIRST)</th>
<th>TIME</th>
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<td>POSITION</td>
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<td>INTERIOR OPS</td>
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<td>EXTERIOR OPS</td>
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<td>EKG</td>
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<td>DISPOSITION</td>
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<td>RETURNED TO STAGING/SERVICE</td>
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<td>TRANSPORTED TO ER</td>
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<td>Tx UNIT</td>
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**NOTES:**

- **HEART RATE:** <110 = within normal limits on arrival <100 = within normal limits 5 min. after arrival
- **TEMPERATURE:** <100.6 = within normal limits If >100.6, monitor q 5 min until wnl If >100.6 after 15 min, consider transport
  If temp <100.6 but heart rate >110, increase rehab time
- **RESPIRATIONS:** <26 = within normal limits on arrival <20 = within normal limits 5 min. after arrival If >26 after 15 min, consider transport
- **BLOOD PRESSURE:** Systolic <150 Diastolic <100 = wnl on arrival Systolic <140 Diastolic < 90 = wnl 5 min after arrival If Systolic >140 or Diastolic >90 after 15 min, consider transport
- **MENTAL STATUS:** Should be alert, oriented on arrival If any alteration of mental status, TRANSPORT
OPS - IN/OUT PROCEDURES

- Accountability
- PPE Storage
- SCBA Exchange
- Vital Signs
- Refreshment
- Medical Eval and Treatment
- Ambulance
OPS - IN/OUT PROCEDURES

- Accountability
- PPE Storage
- SCBA Exchange
- Vital Signs
- Liquid and Food Refreshment
- Food Wagon
- Toilet Facilities and Handwashing
- Medical Eval and Treatment
- Liquid Refreshment
- Ambulance
- Wind
- Air Trailer
- Shower
TIPS FOR EFFECTIVE REHAB

• Rehab starts before the incident
• Don’t get beat up, take breaks and take them often
• Get out of your gear to include pants
• Medical monitoring
• Aggressive cooling
• Understand work cycles
• Buddy check
WHAT ARE YOU GOING TO DO?

• Review SOP/SOG
• Pre-incident planning
• Get ideas from the web and other depts.
• What equipment do you have and what does other agencies have
• Educate your responders
• Exercise and evaluate
THANK YOU AND STAY SAFE

• ARE WE DOING ENOUGH?

• Questions?