Homeland Security & the National Incident Management System (NIMS)

National Incident Management System: Goals

- Adapt Consistent Nationwide Approach
  - Federal
  - State
  - Local
- Foster Interoperability & Compatibility
  - Command & Management
  - Preparedness
  - Resource Management
  - Communications & Information Management
  - Supporting Technologies
  - Ongoing Management & Maintenance

National Incident Management System: Concepts & Principles

- Flexibility
  - Address **all** incidents regardless of cause, size, location or complexity
  - Addresses **all** phases of incident management; prevention, preparedness, response, recovery, and mitigation
- Standardization
  - Incident Command System (ICS)
  - Multi-agency coordination systems
  - Public information systems

National Incident Management System: Components

- Command & Management
- Preparedness
- Resource Management
- Communications & Information Management
- Supporting Technologies
- Ongoing Management & Maintenance

http://www.dhs.gov/interweb/assetlibrary/NIMS-90-web.pdf

National Incident Management System: Command & Management

- Incident Command System (ICS)
  - Command, Operations, Planning, Logistics
- Multi-agency Coordination Systems
  - Federal, State, Local, Tribal, Regional
- Public Information Systems
  - Timely & Accurate Information Delivery

National Incident Management System: Preparedness

- Planning
- Training
- Exercises
- Personnel Qualification & Certification
- Equipment Acquisition & Certification
- Mutual Aid
- Publications Management

National Incident Management System: Resource Management

- Describe
- Inventory
- Mobilize
- Dispatch
- Track
- Recover

National Incident Management System: Communications & Information Mgmt.

- Incident Management Communications
  - Effective & Interoperable
- Information Management
  - Use Commonly Accepted "Architecture"
  - Notify **all** Agencies/Jurisdictions Involved:
    - Managers/Directors of Incident
    - Entities Impacted by Incident
    - Contributors of Resources to Incident

National Incident Management System: Supporting Technologies

- Voice & Data Communications Systems
- Information Management Systems
- Data Display Systems
- Other Specialized Technologies

National Incident Management System: Ongoing Management & Maintenance

- Routine Review
- Continuous Refinement

Incident Command System & Federal Response Plan

Incident Command System

Incident Command System Goals

- Common Terminology
- Effective Span of Control
- Organizational Flexibility
- Personnel Accountability
- Comprehensive Resource Management
- Unified Command & Incident Action Plans

http://www.nysemo.state.ny.us/training/ics/explain.htm

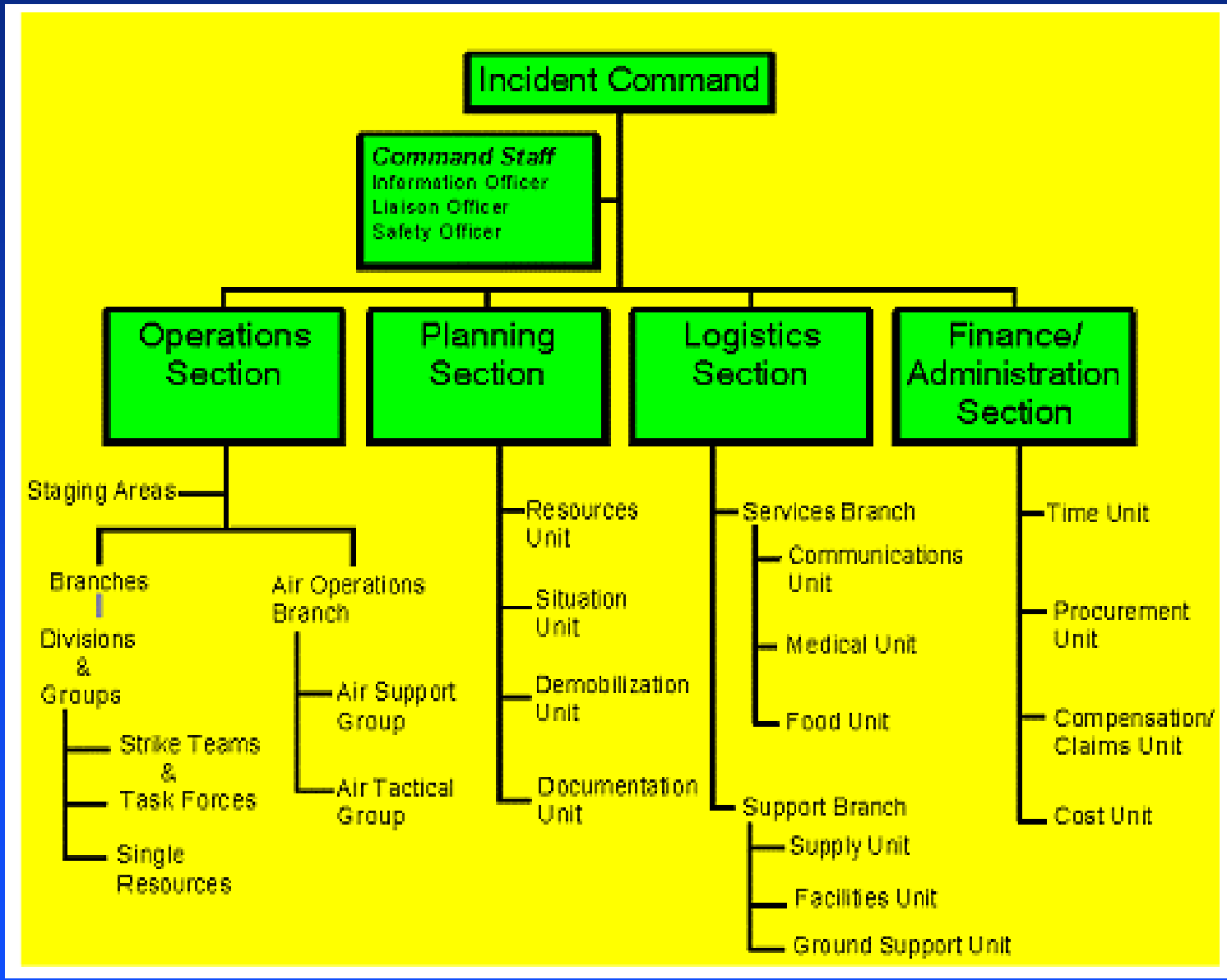
Incident Command System: History

- Southern California wildfires in 1970
- 600,000+ acres burned
- 772 structures lost
- Lasted 13 days
- 16 lives lost
- Federal, county, and city jurisdictions affected simultaneously

Incident Command System: History – Lessons Learned

- Lack of a common organization
- Poor on-scene and inter-agency communications
- Inadequate joint planning
- Lack of valid and timely intelligence
- Inadequate resource management
- Limited prediction capability

Incident Command System



Incident Command System: Overview

Command (executive)

- Organizing to meet the needs of the incident
- Establishing incident control objectives
- Setting priorities for work accomplishment
- Assuring development of command-approved Action Plans
- Approving of resource orders and releases
- Approving of public information outputs
- Coordinating with public officials and other agencies

Incident Command System: Overview

Operations (line)

- Achieving command objectives
- Directing tactical operations
- Participating in the planning process
- Modifying Action Plans to meet contingencies
- Providing intelligence to Planning and Command
- Maintaining discipline and accountability

Incident Command System: Overview

Planning (staff)

- Maintaining accurate resource status
- Gathering and analyzing situation data
- Providing displays of situation status
- Estimating future probabilities
- Preparing alternative strategies
- Conducting planning meetings
- Compiling and distributing approved Action Plans

Incident Command System: Overview

Logistics (staff)

- *The Service Branch* – responsible for communications, food services, medical care for incident personnel
- *The Support Branch* – responsible for providing adequate facilities, obtaining supplies and resources, and service equipment

Incident Command System: Overview

Finance (staff)

- Incident Action Planning (record keeping)
- *Disaster Relief Records* – assures that cost and damage records in proper format to assure reimbursement
- *Contracting* – negotiates with vendors that provide services not available through involved agencies
- *Agreements with other Agencies* – share resources
- *Injury and Damage Documentation* – prepared by Compensation or Claims Unit for incident personnel

Unified Command

Applies to about 5% of all emergencies that become serious enough to require several agencies, each with own legal obligation to perform some type of action, not just assist

- Incidents that affect more than one geographical jurisdiction
- Incidents that affect more than one functional jurisdiction
- Incidents affecting geographical and functional jurisdictions

Unified Command Goals

- Improve information flow between agencies involved
- Develop single collective approach to management of incident
- Reduce or eliminate functional and geographical complexities
- Optimize efforts of all agencies
- Reduce or eliminate duplications of effort

Federal Response Plan

Federal Response Plan Purpose

- Sets forth fundamental policies and responsibilities
- Describes array of Federal response
- Organizes types of support State needs under 12 Emergency Support Functions
- Describes process and methodology
- Addresses linkages to other Federal plans
- Provides focus for interagency and intergovernmental emergency preparedness
- Serves as foundation for development of detailed procedures that are effective and efficient

Federal Response Plan Scope

- A major disaster as defined by the Robert Stafford Disaster Relief and Emergency Assistance Act (fire, flood, etc.)
- Addresses disaster issues (saving lives, protecting property, meeting basic human needs, restoring disaster affected, reducing vulnerability to future disasters (response, recovery, mitigation); long-term not addressed
- Applies to all federal agencies tasked to provide assistance; applies to any US property and citizen

Federal Response Plan (FRP): Organization

- Basic Plan
- Emergency Support Function Annexes
- Recovery Function Annex
- Support Annexes
- Incident Annexes
- Appendices

http://www.fema.gov/pdf/rrr/frp/frp2003.pdf

FRP- ESF 12 Agencies

- ESF #1 - Transportation
- ESF #2 - Communications
- ESF #3 - Public Works & Engineering
- ESF #4 - Firefighting
- ESF #5 - Information and Planning
- ESF #6 - Mass Care
- ESF #7 - Resource Support
- ESF #8 - Health & Medical Services
- ESF #9 - Urban Search & Rescue
- ESF #10 - Hazardous Materials
- ESF #11 - Food
- ESF #12 - Energy

ESF #10 Hazardous Materials

Primary Agency:

- Environmental Protection Agency

Support Agencies:

- U.S. Coast Guard
- Department of Agriculture
- Department of Commerce
- Department of Defense
- Department of Energy
- Department of Health and Human Services
- Department of the Interior
- Department of Justice
- Department of Labor
- Department of State
- Department of Transportation
- Nuclear Regulatory Commission

Federal Response Plan – Emergency Support Function Designation Matrix

#	1	2	3	4	5	6	7	8	9	10	11	12
ESF / Agency	Transportation	Communications	Public Works and Engineering	Firefighting	Information and Planning	Mass Care	Resource Support	Health and Medical Services	Urban Search and Rescue	Hazardous Materials	Food	Energy
USDA	S	S	S	P	S	S	S	S	S	S	P	S
DOC		S	S	S	S		S			S		
DOD	S	S	P	S	S	S	S	S	S	S	S	S
DOEd					S							
DOE					S		S	S		S		P
HHS			S		S	S		P	S	S	S	
HUD						S						
DOI		S	S	S	S					S		S
DOJ					S			S	S	S		
DOL			S				S		S	S		
DOS	S									S		S
DOT	P				S		S	S		S		S
TREAS	S				S		S					
VA			S			S	S	S				
AID								S	S			
ARC					S	P		S			S	
EPA			S	S	S			S		P	S	
FCC		S										
FEMA	S	S		S	P	S	S	S	P		S	
GSA	S	S			S	S	P	S			S	
NASA					S		S		S			
NCS		P			S		S	S				S
NRC					S					S		S
OPM							S					
SBA					S							
TVA	S		S									S
USPS	S					S		S				

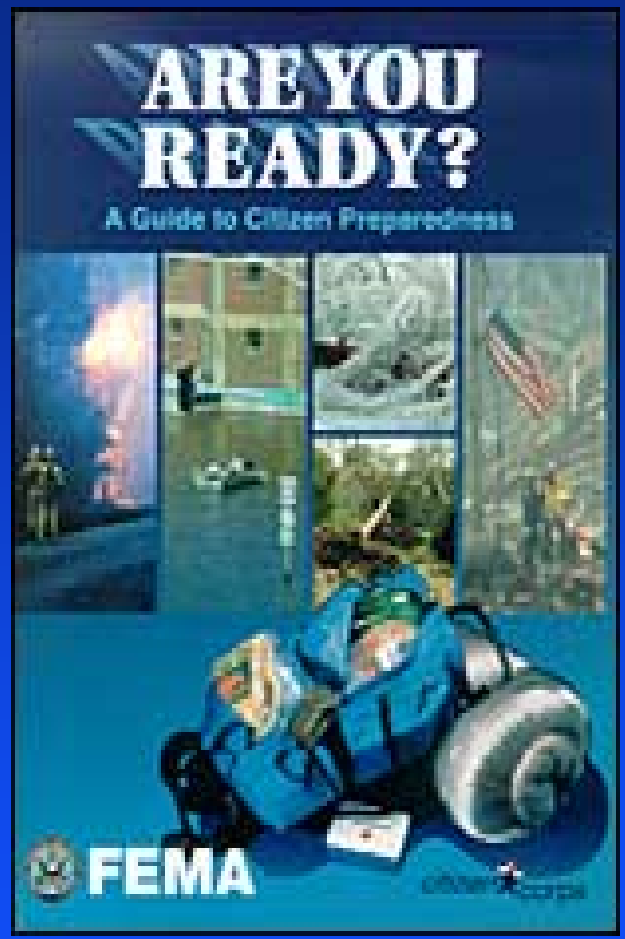
P = Primary Agency: Responsible for Coordination of the ESF

S = Support Agency Responsible for Supporting the Primary Agency

FEMA Planning Materials

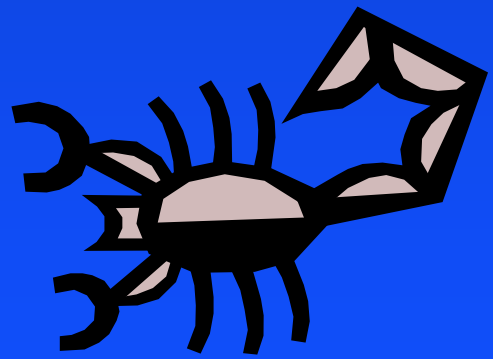
Copies of *Are You Ready? A Guide to Citizen Preparedness* are available through the FEMA Publications warehouse (1.800.480.2520), FEMA publication H-34.

For large quantities, your organization may reprint the publication.



http://www.fema.gov/areyouready/

Biological Hazards in Field



Snake Bites (Venom)

Poisonous New York Snakes (in wild) -

- These are the timber rattlesnake, the massasauga (erroneously called "pygmy rattler"), and the copperhead.



Care -

- wash wound, keep bitten part still, keep bitten part lower than heart, call local emergency number; seek medical attention ASAP; snakebite kits that require cutting and suction not recommended; tourniquet use not recommended

http://www.esf.edu/pubprog/brochure/snakes/snakes.htm

Animal Bites (Rabies)

Signals -

- bite marks, bleeding; watch animal for drooling, appearing partially paralyzed, acting irritable, mean, or strangely quiet

Care -

- wash wound if minor, control bleeding, apply antibiotic ointment, cover wound, get medical attention if bleeding severely or suspicion of rabies, call local emergency number or animal control personnel

Insect Bites

Signals -

- stinger may be present, pain, swelling, possible allergic reaction

Care -

- remove stinger - scrape it away or use tweezers, wash wound, cover area, apply cold pack, watch for sign of allergic reaction

West Nile Virus (Mosquito Bites)

Signals -

- mild illness, fever, headache, body aches, mild rash or swollen lymph glands; encephalitis (inflammation of brain)- severe headache, high fever, stiff neck, confusion, coma, muscle weakness possible for elderly individuals – may be fatal

Care -

- no specific therapy; hospitalization needed in more severe cases; no vaccine available

Spider Bites / Scorpion Stings

Signals -

- bite mark, pain, swelling, nausea and vomiting, difficulty breathing or swallowing

Care -

- wash wound, apply cold pack, get medical care to receive antivenin, call local emergency number, if necessary

Tick Bites

Signals -

- rash (bull's eye or bruise); "flu-like" pain of joints and muscles, fever, headache, weakness; arthritis, numbness, memory loss

Care -

- remove tick carefully (if possible), wash area, apply antibiotic ointment, seek medical care, observe site periodically

Plant Hazards

Poison ivy, poison oak, poison sumac

- **Symptoms -** rash, weeping sore

- **Treatment -** wash with soap and water; if rash, apply paste of baking soda and water on area several times a day; Calamine, Caladryl, or Benadryl can also soothe area; Corticosteroids may be necessary if condition worsens

Prevention

- Use repellants with diethyltoluamide DEET
- Wear long-sleeve shirts and long pants
- Tuck pant leg into socks or boots
- Tuck shirt into pants
- Wear light color clothes to see insects better
- Wear sturdy hiking boots
- Stay in middle of trails and watch your step
- Check clothing often for signs of insects

Cold Stress

Cold Stress

- Basic heat transfer concepts
- How does body handle cold? (shell vs. core)
- Cold Disorders
- Windchill Index
- Prevention

Basic Heat Transfer Concepts

- **Conduction -** Heat transfer occurs when two bodies in physical contact (heat pad)
- **Convection -** Heat transfer occurs by moving gas or liquid (steam radiator, HVAC system)
- **Radiation -** Heat transfer occurs without presence or movement of matter in or through space (sunlight, foundry)

Types of Heat Exchange between Person & Ambient Environment

- **Metabolic -** generated to keep body functioning and active (always positive)
- **Radiant** - emitted from or received by body depending on T^{o} of body vs. surroundings
- **Convective -** energy transferred between skin and air (T^{o} of skin vs. surroundings)
- **Evaporative -** heat loss from vaporization of perspiration

Body Concept in Temperature Control

- **Shell** (capillaries, nerves, muscles, fat)
- **Core** (heart, lungs, brain, kidneys, and other internal organs)

How the Body Handles Cold

- Cold first affect skin by cooling blood in surface capillaries
- Blood vessels constrict to reduce heat loss
- Glucose is produced to provide additional fuel for heat-generating metabolism
- Involuntary shivering produces heat by causing rapid muscle contractions

Cold Disorders

- Hypothermia
- Blood Vessel Abnormalities
- Frostbite

Hypothermia (Body Temperature <95^{0}F)

- Uncontrollable shivering
- Vague or slow slurred speech
- Memory lapses
- Drowsiness, fatigue
- Cool bluish skin
- Slow, irregular breathing
- Low blood pressure
- Pain in the extremities

Hypothermia – Land

- Move person to warm, dry area
- Remove wet clothing, replace with warm, dry clothing or wrap in blankets
- Have person drink warm sweet drinks, if alert – NO Caffeine in drinks or alcohol
- Have person move arms and legs to create muscle heat; use warm bottles on arm pit, groin, neck, and head if not possible
- DO NOT rub body or place in warm bath; may stop heart

Hypothermia – Water

- Call for emergency help (heat loss 25x faster)
- DO NOT remove any clothing; secure clothing closer to body to to use trapped water near skin as insulator; keep head out of water and cover with hat or hood
- Get out of water ASAP or climb floating object; DO NOT swim if floating object or person not easily reached – action wastes heat
- If getting out of water not possible, wait quietly and conserve body heat (fold arms across chest, keep thighs together, bend knees, cross ankles; huddle with another person, chests held closely, if possible

Blood Vessel Abnormalities

- **Raynaud's phenomenon -** whitish fingers, numbness, itching, tingling, burning
- **Acrocyanosis -** Slightly blue, purple, or grayish coloring of hands and/or feet
- **Thromboangiitis obliterans -** inflammation and fibrosis of connective tissue surrounding arteries, veins & their walls resulting in blockage of arteries

Frostbite

- Freezing of fluids around cells of body tissue - nose, cheeks, ears, fingers, toes
- **1st º** - freezing w/o blistering or peeling
- **2nd º -** freezing w/ blistering or peeling
- **3rd º -** freezing w/ skin tissue death
- Skin color is pale and waxy
- Pain felt at first, but subsides
- Affected part is cold and numb

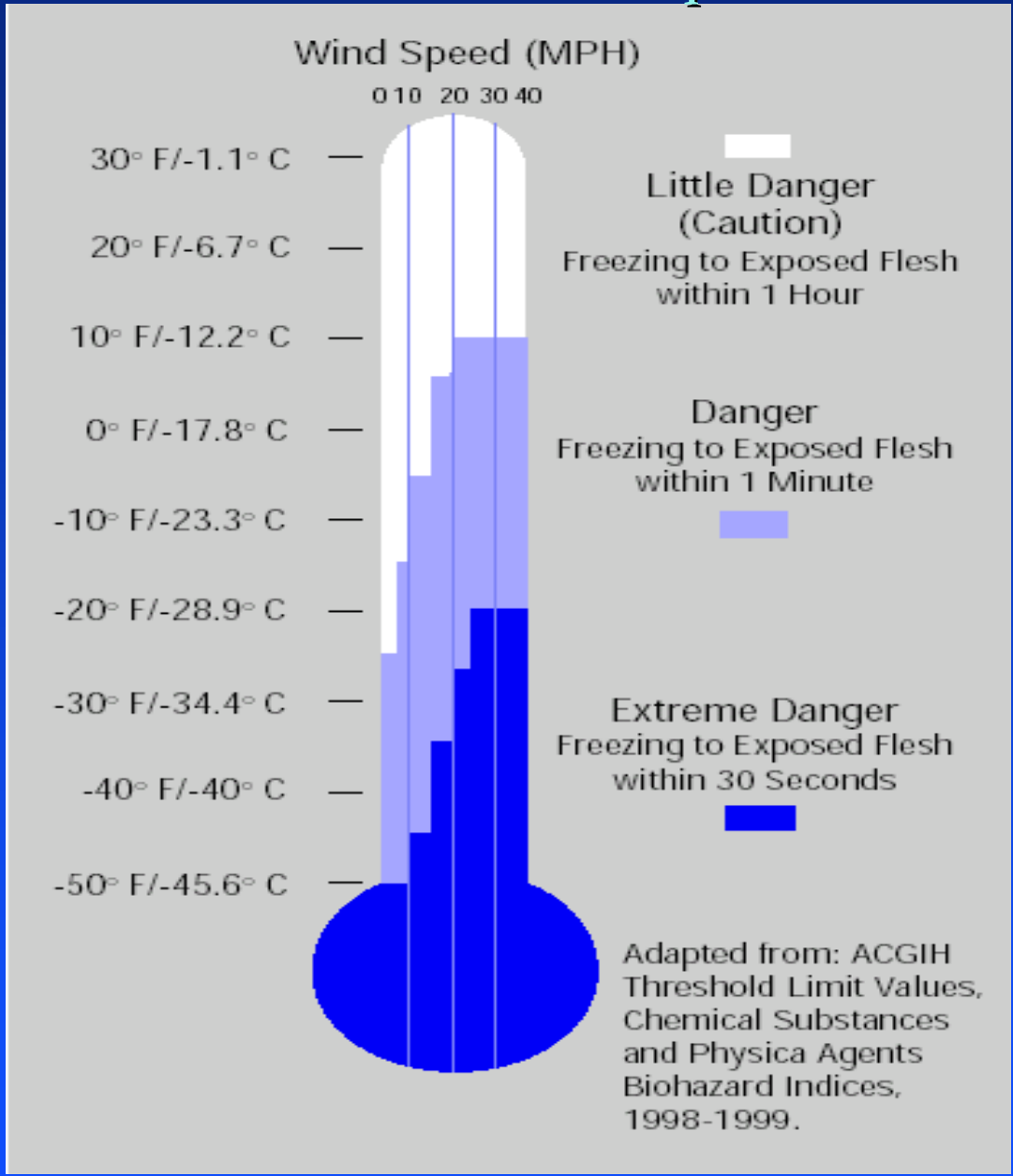
Frostbite

- Move person to warm, dry area
- Remove wet or tight clothing that may impact circulation to area affected
- DO NOT rub affected area; causes damage to skin and tissue
- ***Gently*** place affected area in warm (1050F) water bath and monitor water T0 to ***slowly*** warm the tissue; warming takes 25-40 minutes; directly pouring on affected area causes tissue damage; avoid warming and cooling area
- Seek medical attention ASAP

Windchill Index

- Based on **windchill factor** which is the **cooling effect** of **any combination** of **temperature** and **wind velocity** or **air movement** (convective heat loss)
- (body part exposed to cold, level of physical activity, and amount of clothing worn **not** taken into account **- only** effect on body)

The Cold Stress Equation



Preventing Cold Stress

- Acclimatization
- Hydration - warm, no caffeine & no alcohol
- Eat a well-balanced diet
- Engineering Controls - general or spot heating, prevent drafts, insulate tools
- Administrative Controls - rest breaks, decrease workplace exposure & frequency

Personal Protective Equipment

- Preserve air space between body and outer layer of clothing to retain body heat
- Protect extremities - they are easily cooled
- Use wool or thermal trousers
- Wear several layers and ensure proper fit
  - Inner layer – capilene, cotton
  - Insulating layer – qualofil, pile
  - Shell layer – ripstop nylon, hypalon, gore-tex
- Use insulated boots with vapor barriers

Heat Stress

Heat Stress

- How the Body Handles Heat
- Heat Disorders
- Environmental Heat Measurement Concepts
- Prevention

How the Body Handles Heat

- Hypothalamus in brain acts as body thermostat
- When body is heated, the blood vessels expand to increase heat loss
- When body is overheated, sweating occurs which, when evaporating, cools the body
- Sodium chloride or salt is lost when sweat is produced and evaporated by air velocity

Heat Disorders

- Heat Rash
- Heat Cramps
- Heat Exhaustion
- Heat Stroke

Heat Rash

- Tiny reddish blisters appear on affected areas
- Experience pricking sensation during heat exposure

Heat Cramps

- Painful spasms of muscles used during work, usually in legs and abdomen

Heat Exhaustion

- Clammy, moist skin
- Pale or flushed skin
- Headache
- Nausea
- Dizziness
- Exhaustion, fatigue
- Giddiness

Heat Stroke

- Red, hot dry skin
- Confusion, loss of consciousness
- Convulsions
- Rapid, weak pulse
- Rapid, shallow breathing

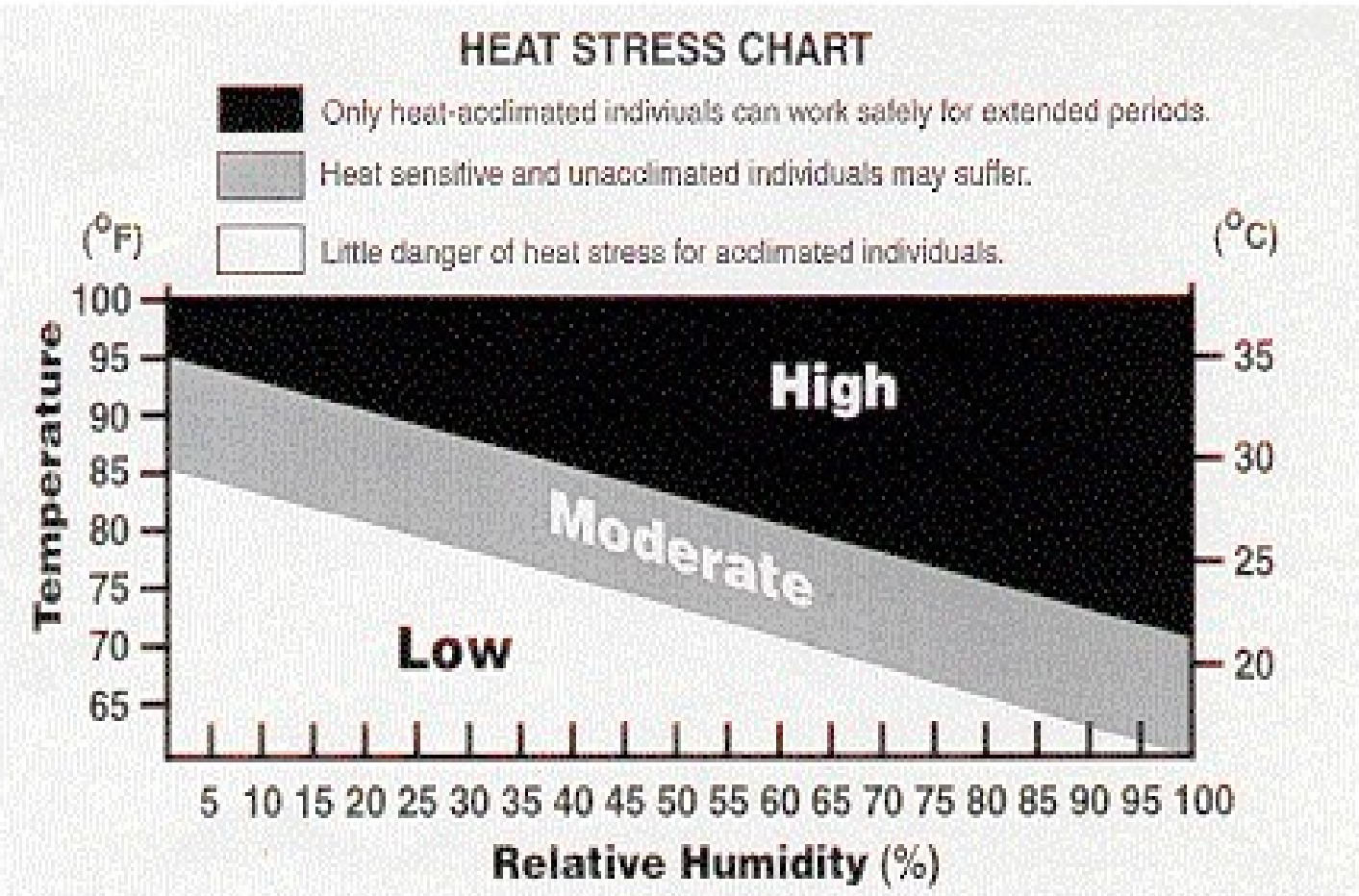
Environmental Heat Measurement Concepts

- Relative Humidity
- Dew point temperature
- Dry bulb temperature
- Wet bulb temperature
- Globe temperature
- Air Velocity

WBGT Index (Heat Stress)

- Used to assess and/or predict level of heat stress to heat-exposed worker
- Does not correlate well with heat strain; work type, dehydration, PPE and equipment not assessed
- Incorporates wet bulb, dry bulb, and globe temperature
  - Wet bulb (humidity) accounts for 70%
  - Black globe (radiant heat and air movement) accounts for 20%
  - Dry bulb (air temperature) accounts for 10%.
- Used by ACGIH & NIOSH
- Used by military for many years w/ good results

Heat Stress Chart



Prevention

- Acclimatization
- Engineering Controls - increase air movement and decrease air temperature, shield worker from radiant source, decrease relative humidity
- Administrative Controls - limiting exposure frequency and duration, training, hydration, electrolytes
- PPE - water cooled, air-cooled, ice packet vest

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CONCLUSION

www.osha.gov - OSHA WEBSITE

www.epa.gov - EPA WEBSITE

www.cdc/niosh.gov - NIOSH WEBSITE

ANDREW BURGIE, M.S.

Center for Occupational and Environmental Health at Hunter College

(212) 481-7652