GLASTONBURY FIRE DEPARTMENT

STANDARD OPERATING GUIDELINES

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CATEGORY: EMERGENCY OPERATONS – GENERAL

SUB- CATEGORY: DEPARTMENT DIRECTIVE

SUBJECT: CLEANING OF PERSONAL PROTECTIVE EQUIPMENT – TURNOUT CLOTHING

RELATED GUIDELINES: EMS-105

Section I – Introduction:

A. Objective

Turnout clothing represents an investment not only financially but in the health and safety of our firefighters. Turnout clothing may be the difference between protection and injury to firefighters. Keeping personal protective clothing clean and properly maintained is not only a way to extend the life of the clothing, but also the firefighter. The proper care and maintenance of turnout clothing is the responsibility of the firefighter.

B. Applicability

To those members that have been issued Structural Firefighting Protective Ensembles by the Glastonbury Fire Department.

C. References

NFPA 1851 – Standard on Selection, Care and Maintenance of Structural Firefighting Protective Ensembles

Section II – General:

NFPA 1851 sets specific requirements for the Department to ensure minimum procedures for the inspection, cleaning, repair, storage and retirement of turnout clothing. Specific procedures for care and maintenance generally come from the clothing manufacturer. Nonetheless, it is up to the individual firefighter to be cognizant of the condition of his/her turnout gear and to keep the clothing clean and properly maintained.

Section III – Inspection:

- Each firefighter must become familiar with his/her personal protective equipment.
- Familiarity helps the firefighter maintain a sense of awareness when changes have occurred that might affect the clothing's performance.
- NFPA 1851 indicates that gear should be inspected after each use and go through an advanced inspection at least once a year.

- While NFPA 1851 permits the department to determine what constitutes "use," it is important to carefully examine gear after the firefighter has been exposed to fire-ground contaminants or encountered other hazardous substances.
- The following highlights the types of damage to look for:

    - ***Routine Inspection***
      Conduct a routine inspection of garments after each use. Look for:
      • Soiling
      • Contamination
      • Physical damage
      • Damaged trim
      • Damaged closures and hardware

    - ***Advanced Inspection***
      At a minimum, conduct an inspection every 12 months or whenever routine inspections indicate that a problem may exist. Advanced inspection areas include:
      • Moisture barrier and seam sealing integrity
      • The fit of the coat/pants overlap
      • Seam integrity including broken or missing stitches
      • Material integrity for loss of strength due to UV or chemical exposure
      • Loss or shifting of thermal liner material
      • Wristlet integrity and functionality
      • Reflective trim and Velcro integrity, attachment and functionality
      • Label integrity and legibility
      • Liner attachment systems
      • Closure system functionality

- Some damage will be obvious, such as discoloration of the outer shell — often caused by high heat exposure resulting in the loss of dye.
- Rips, punctures, opened seams, and loose trim are obvious signs of wear and tear
- But several types of damage may be less evident.
    - Film of the moisture barrier can delaminate or develop pin holes with or without visual changes
    - Seam tape can come loose.
    - Damage can occur to some thermal barriers without any sign of missing quilt stitching.
    - Other changes can take place that cannot be discerned without testing.

- The best practice for inspecting clothing is to look at its condition often and to take note of any changes.
- If you cannot determine where degradation or a harmful condition has taken place, it is best to show your clothing to your Captain and/or his/her designee.

Section IV – Cleaning:

- Firefighter protective clothing must be kept clean to ensure its proper performance.
- Dirty turnout gear carries less insulation, is more likely to conduct heat and electricity, lacks liquid shedding properties and can become potentially flammable.
- Moreover, many fire-ground contaminants are carcinogens and skin toxic chemicals.
- Ensembles and ensemble elements shall be evaluated by the wearer for the level of appropriate cleaning after each use.
- Turnout clothing needs to be cleaned regularly to prevent these problems.
- Improper cleaning can also destroy clothing or worsen its protective performance.

- There are three types of cleaning as defined in NFPA 1851
  - Routine
  - Advanced
  - Specialized cleaning

1. Routine cleaning:
   - Is performed after any fire-ground use where soiling has occurred.
   - It involves brushing debris from the clothing, rinsing it with water, and applying spot cleaning as necessary with warm soapy water.
   - Ensure that the detergent used to make the soapy water has a pH range of not less than 6.0 and not greater than 10.5.
   - It is a good idea to inspect the condition of the clothing during routine cleaning.

2. Advanced cleaning:
   - Is more thorough and must be done at least every six months or more frequently, depending on the use and condition of the clothing.
   - Cleaning involves hand washing the clothing in a utility sink or machine washing.
   - In either case, proper procedures must be followed.

3. Specialized Cleaning:
   - In cases where the clothing has been contaminated by chemicals or blood-borne pathogens.
   - Clothing is to be bagged in accordance to SOG EMS-105
   - A contracted vendor will be contacted and agreements will be made to pick up the clothing.

- The basic guidelines and conditions for cleaning turnout clothing are as follows:

1. Routine Cleaning
   1. Members shall be responsible for the routine cleaning of their issued ensemble and ensemble elements after each use by performing the following steps:
      - Brush off debris
      - Rinse with water
      - Lightly scrub item with soft bristle brush, if needed
      - Spot clean, if needed
   2. Involves brushing debris from the clothing, rinsing it with water, and applying spot cleaning as necessary with warm soapy water.
   3. In order to avoid cross contamination, garment element layers shall be isolated whenever possible
   4. Ensure that the detergent used to make the soapy water has a pH range of not less than 6.0 and not greater than 10.5.
   5. Re-inspect the item
   6. Clean again if necessary

2. Advanced Cleaning
   1. At least every six months, subject clothing to more thorough cleaning; general precautions include:
      1. Examine manufacturer's label
      2. DO NOT USE Chlorine bleach or chlorinated solvents
      3. Use cleaning solutions with a pH range of not less than 6.0 and not greater than 10.5
      4. No high velocity water jets such as power washers
      5. Clean and decontaminate protective ensembles separately from non-protective items
      6. Where shells and liners are separable, clean and decontaminate those items with like items

(i.e., shells with shells and liners with liners)

3. Guidelines when cleaning in a utility sink
    1. Do not overload sink
    2. Pre-treat if necessary
    3. If the cleaning involves brushing debris from the clothing, rinsing it with water and apply spot cleaning as necessary with warm soapy water.
    4. Ensure that the detergent used to make the soapy water has a pH range of not less than 6.0 and not greater than 10.5.
    5. Water temperature does not to exceed 105 degrees
    6. Add cleaning solution or detergent
    7. Wear protective gloves & eye/face splash protection
    8. Scrub gently using a soft bristle brush. Use care with moisture barrier assemblies
    9. Drain water from sink
    10. Refill sink; agitate gently using gloved hand or stir stick
    11. Gently wring out garments and drain water
    12. Repeat (7) and (8) until garment is rinsed
    13. Dry the elements
    14. Inspect and rewash if necessary

- Machine Washing of Personal Protective Equipment
    1. Machine washing is best done in a front loading washer/extractor to limit damage caused by top-loading machine agitators.
    2. The following procedures should be followed when utilizing the Department's gear washer.
        i. If the turnout gear is equipped with a drag rescue device (DRD) and the DRD is removable, the DRD should be removed prior to being laundered. If the DRD also requires cleaning, it should be placed in a separate bag for washing and drying.
        ii. Pre-treat and spot clean if necessary
        iii. Where shells and liners of the turnout gear are separable, those items shall be cleaned and decontaminated only with like items (i.e. shells with shells and liners with liners).
        iv. Fasten all closures, including pocket closures, hook and loop, snaps, zippers, hooks and dees
        v. Turn garment inside out
        vi. Select appropriate cleaning cycle and follow the instructions as listed with the washer
        vii. Dry the elements using the appropriate drying level as listed on the department dryer
        viii. Inspect and rewash if necessary
        ix. If the washer is to be used for other than protective ensemble elements rinse out the machine by running while empty through a complete cycle.
    3. Proper drying is equally important.
    4. As turnout clothing is thick and bulky, drying is slow.
    5. Nevertheless, machine drying at high settings will quickly ruin this clothing (even though rated for high temperature use).
    6. If machine drying is selected, be sure to use the ***no heat setting*** if available.
    7. The following procedures should be followed when drying turnout gear either by air or machine:

- Air Drying Guideline
    1. Place elements in an area with good ventilation
    2. Do not dry in direct sunlight.
    3. It is best to hang clothing for air drying inside and away from direct light, especially sunlight.
    4. UV radiation in sunlight breaks down some of the fibers in turnout clothing.
    5. Drying time can be reduced by using a fan with heated air over the clothing.

- Machine Drying Guideline - other than the Department dryer

    1. Do not overload the machine
    2. Fasten all closures
    3. Turn garments inside out and place in a mesh laundry bag
    4. If the dryer has a no-heat option, use it
    5. If heat must be used, the basket temperature shall not exceed 105 degrees
    6. If heat is used, remove garments before they are completely dry
    7. Allow to air dry or utilize the no heat setting until completely dry

- Machine Drying Guideline - Department Gear Dryer

    1. Do not overload the machine
    2. Hang elements separately on the hangers included with the dryer
    3. Select appropriate drying cycle for the ensemble or ensemble elements as required

- Routine Cleaning of Helmets:
    1. If it is necessary to totally immerse the helmet, the impact cap shall be separated from the helmet shell.
    2. Each element component shall be washed and dried separately before reassembly.
    3. Helmets should be cleaned with hot tap water and mild (household) detergent (i.e. Windex without ammoniated), dishwashing detergent or Simple Green.
    4. Solvents shall **NOT** be used to clean or decontaminate helmets or helmet components.
    5. The manufacturer shall be consulted if stronger cleaning agents are required.
    6. Helmets shall not be machine dried using equipment that produces mechanical action from tumbling or agitation.

- Routine Cleaning of Footwear:
    1. Footwear should be cleaned with hot tap water and mild (household) detergent (i.e. Windex without ammoniated); dishwashing detergent or Simple Green.
    2. Solvents shall not be used to clean or decontaminate footwear.
    3. The manufacturer shall be consulted if stronger cleaning agents are required.
    4. Footwear shall not be machine dried using equipment that produces mechanical action from tumbling or agitation.

Section V – Repair:

- Turnout clothing can only be repaired by a facility that has experience in repairing turnout clothing or by consultation with the manufacturer.
- Improperly repaired clothing can be unsafe, potentially resulting in failure.

Section VI – Storage:

- Proper storage is a must for maintaining turnout gear.
    1. The space should be away from direct light, especially sunlight, contaminants, and objects that can physically damage clothing.
    2. The space should also be well ventilated.
    3. Never store firefighter clothing in living quarters or at home.

Section VII – Retirement:

- As a general rule, the Glastonbury Fire Department will retire an individual's turnout gear after ten years of service.
- Other factors that will warrant the retirement of turnout clothing include
    1. The clothing is considered unsafe
    2. Cannot be effectively cleaned or decontaminated
    3. Cost of repairs is more than half of the original purchase price.
- The lifespan of protective clothing is also dependent upon the types of exposures, frequency of wear, and the care and maintenance that have been provided.
- The service life of turnout gear can be drastically cut short — as short as two to three years — if it is heavily used, worn or improperly maintained.

Section VIII – Approval:

Fire Chief Richard P Thuy Date of Approval: 1/11/16