OSWEGO TOWN FIRE DISTRICT

TURNOUT GEAR ENSEMBLE

and ENSEMBLE ELEMENTS

Inspections, Cleaning, Repair & Replacement

Approved – Nov, 2010

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I. INTRODUCTION

The purpose of this best practice is to provide a guideline for the Inspection, Cleaning, Decontamination, Repair, Storage, Retirement and Record keeping of OTVFD owned Turnout Gear Ensembles and Ensemble Elements. This best practice provides for the management and supervision of emergency response personnel using firefighting protective turnout gear. The purpose of this best practice is to establish a program for firefighting protection ensembles and ensemble elements to reduce the safety risks and potential health risks associated with poorly maintained, contaminated or damaged fire fighting protective ensembles and ensemble elements.

Any ensemble element found to be deficient during the Routine, Yearly or Advanced Inspection should be identified with a tag and immediately removed from service.

The organization (OTVFD) should compile and maintain records on their firefighting protective ensembles and ensemble elements.

II. DEFINITIONS

- **Crazing- Small** cracks on the surface of the helmet
- **Contamination- the** presence of extraneous, especially infectious material that renders a substance harmful
- **Drag Rescue Device (DRD**) - A strap incorporated with the Turnout gear which enables the rescuer to drag a downed firefighter in the horizontal position
- **Hazardous Material- Any** item or agent (Biological, Chemical, Physical) which has the potential to cause harm to humans, animals or the environment
- **Independent Service Provider (ISP**) - An expert or professional in their field of service
- **Interface Component(s)**- Coat/Pant interface, front closure on the jacket, sleeve/glove interface, pant/boot interface
- **Personal Safety System-** A reliable means of egress from a burning multi-story structure when using a conventional exit is no longer possible. The Personal Safety System is comprised of an integrated harness and emergency escape rope assembly
- **Soiling**- unclean, dirty on the surface
- **Universal Precautions**- A set of precautions designed to prevent the transmission of blood borne pathogens

III. ROUTINE INSPECTION

Oswego Town Volunteer Fire Department members should conduct a routine inspection of their protective ensembles and ensemble elements after each use or a minimum of once a month. Each member shall document the monthly check on the form located in their respective lockers (see Appendix C). Those not completing a monthly check of their gear will be suspended from active duty until such inspection has been completed and documented.

The routine inspection of Firefighting Ensembles should include as a minimum the following:

1. **Turnout Coat and Trousers**
   A. Soiling
   B. Contamination
   C. Rips, tears and cuts
   D. Damaged or missing hardware and closure systems
   E. Thermal damage such as charring, burn holes, melting, discoloration of any layer
   F. Damaged or missing reflective trim
   G. Loss of seam integrity and size compatibility of shell, liner and the Drag Rescue Device
2. **Hood elements:**
   A. Soiling
   B. Contamination
   C. Rips, tears and cuts
   D. Thermal damage such as charring, burn holes, melting and discoloration
   E. Loss of face opening adjustment
   F. Loss of seam integrity and broken or missing stitches
3. **Helmet Elements:**
   A. Outer shell - Soiling, contamination, cracks, crazing, dents and heavy abrasions. Thermal damage such as bubbling, soft spots, warping or discoloration.
   B. Ear flaps – Rips, tears, cuts, mold or other contaminants.
   C. Internal suspension – broken or missing components
   D. Face Shield/goggles – Discoloration, major abrasions, cracks.
   E. Reflective trim
4. **Glove Element:**
   A. Soiling
   B. Contamination
   C. Rips, tears, cuts, mold or other contaminants.
   D. Thermal damage such as charring, burn holes, melting, discoloration of any layer
   E. Shrinkage
   F. Loss of elasticity or flexibility
   G. Loss of seam integrity and broken or missing stitches
5. **Footwear:**
   A. Soiling
   B. Contamination
   C. Rips, tears, cuts, punctures, mold or other contaminants.
   D. Thermal damage such as charring, burn holes, melting and discoloration
   E. Closure system component damage and functionality
   F. Loss of seam integrity and broken or missing stitches
6. **Drag Rescue Device (DRD):**
   A. Installation in the garment
   B. Soiling
   C. Contamination
   D. Rips, tears, cuts, mold or other contaminants.
   E. Thermal damage such as charring, burn holes, melting and discoloration
7. **Personal Safety System (Self Rescue Device); Integrated Harness and Rope Assembly**
   A. Soiling

B. Contamination
C. Rips, tears, cuts, mold or other contaminants.
D. Thermal damage

8. **Interface Component (jacket front closure, coat/pant, sleeve/glove, pant/boot interface):**
   A. Soiling
   B. Contamination - rips, tears, cuts, mold or other contaminants.
   C. Physical damage such as charring, burn holes, melting and discoloration
   D. Loss of shape or inability to remain attached to the respective element
   E. Loss of seam integrity and broken or missing stitches

IV. YEARLY INSPECTION - (May of every year)

Yearly Inspection and associated testing should be managed and performed by the Organization's (OTVFD) designated personnel. Yearly inspections of all protective ensemble elements should be conducted at a minimum of every 12 months or whenever routine inspections indicate that a problem with the ensemble is identified. The findings of the yearly inspection should be documented on an inspection form (See Appendix A).

1. **All separable layers of the Turnout Gear Ensembles/Ensemble Elements should be individually inspected for the following:**
   A. Soiling
   B. Contamination
   C. Rips, tears, cuts, mold or other contaminants.
   D. Damaged or missing hardware and closure systems
   E. Thermal damage such as charring, burn holes, melting, discoloration of any layer
   F. Loss of moisture barrier integrity indicated by rips, cuts, tears, abrasions, discoloration or thermal damage
   G. Evaluation of system fit and coat/trouser overlap
   H. Damaged or missing reflective trim
   I. Loss of seam integrity and size compatibility of shell, liner, Drag Rescue Device and Personal Safety System
   J. Loss of material physical integrity as evidenced by discoloration, significant changes in material texture, loss of material strength, loss of liner material and shifting of liner material
   K. Loss of wristlet elasticity, stretching, runs, cuts or burn holes
   L. Manufacturer label integrity and legibility
   M. Hook and loop functionality
   N. Liner attachment systems
   O. Closure system functionality
   P. Correct assembly and size compatibility of shell, liner and drag rescue device (DRD)
2. **Hood**:
   A. Soiling
   B. Contamination
   C. Rips, tears, cuts, mold or other contaminants.
   D. Thermal damage such as charring, burn holes, melting and discoloration
   E. Loss of face opening adjustment
   F. Loss of seam integrity and broken or missing stitches
3. **Helmet Elements:**
   A. Outer shell - Soiling, contamination, cracks, crazing, dents and heavy abrasions. Thermal damage such as bubbling, soft spots, warping or discoloration.
   B. Ear flaps – Rips, tears, cuts, mold or other contaminants.
   C. Internal suspension – broken or missing components
   D. Face Shield/goggles – Discoloration, major abrasions, cracks.
   E. Reflective trim

4. **Glove:**
    A. Contamination
    B. Rips, tears, cuts, mold or other contaminants.
    C. Inverted liner
    D. Thermal damage such as charring, burn holes, melting, discoloration of any layer
    E. Shrinkage
    F. Loss of elasticity or flexibility
    G. Loss of elasticity and shape of wristlets
    H. Loss of seam integrity and broken or missing stitches
    I. Soiling
5. **Footwear:**
    A. Soiling
    B. Contamination
    C. Rips, tears, cuts, punctures mold or other contaminants.
    D. Thermal damage such as charring, burn holes, melting and discoloration
    E. Exposed or deformed steel toe, steel midsole or shank
    F. Loss of water resistance
    G. Excessive tread wear
    H. Closure system component damage and functionality
    I. Loss of seam integrity and broken or missing stitches
    J. Condition of lining such as tears, excessive wear and separation from the outer layer
    K. Heel counter failure- the heel counter is a rigid piece embedded within the heel of the boot to improve the support provided to the wearer's foot
6. **Drag Rescue Device (DRD):**
    A. Installation in the garment
    B. Soiling
    C. Contamination
    D. Rips, tears, cuts, mold or other contaminants.
    E. Thermal damage such as charring, burn holes, melting and discoloration
7. **Personal Safety System (Self Rescue Device); Integrated Harness and Rope Assembly**
    A. Soiling
    B. Contamination
    C. Rips, tears, cuts, mold or other contaminants.
    D. Thermal damage such as charring, burn holes, melting and discoloration
8. **Interface Component (jacket front closure, coat/pant, sleeve/glove, pant/boot interface):**
    A. Soiling
    B. Contamination
    C. Physical damage such as charring, burn holes, melting and discoloration
    D. Loss or reduction of properties that allow the component to continue as effective interface such as loss of shape or inability to remain attached to the respective elements, if attachment is required
    E. Loss of seam integrity and broken or missing stitches

V. ADVANCED INSPECTIONS

Turnout Coat Liner:

1. Complete liner inspection of all garment elements should be conducted at a minimum after 5 years in service or whenever advanced inspections indicate that a problem with the liner could exist. The liner system should be opened to expose all layers for inspection and testing. This may require undoing the stitching of the liner.
2. The moisture barrier and the thermal barrier should be inspected for the following:
    - Physical damage to all layers and sides of each layer such as rips, cuts, abrasions
    - Thermal damage such as charring, burn holes, melting or discoloration of any layer
    - Loss of seam integrity, broken or missing stitches, and loose or missing moisture barrier seam tape
    - Material physical integrity; UV or chemical degradation as evidenced by discoloration, significant changes in material texture, loss of material strength, loss of liner material or shifting of liner material
    - De-lamination as evidenced by separation of film from substrate fabric, flaking or powdering.

The moisture barrier should be tested using the hydrostatic test to evaluate the water penetration barrier and should show no leakage. The hydrostatic test is called the "Cup Test" where the moisture barrier is placed in a leak proof, clamped, horizontal position with a cup of water applied for 15 seconds. This test provides inspection without opening the liner.

The result of each water penetration barrier evaluation (Cup Test) should be recorded.

VI. CLEANING AND DECONTAMINATION

Oswego Town Volunteer Fire Department members should evaluate their turnout gear ensembles for cleaning level after each use.

Turnout gear ensembles contaminated with CBRN (Chemical, Biological, Radiological and Nuclear) terrorism agents should be immediately retired after the confirmed exposure and should not be subjected to cleaning or decontamination.

Turnout gear ensembles that are known or suspected to be contaminated with hazardous material should be evaluated by the wearer under the direction of the Senior Officer on scene by conducting a preliminary assessment of the extent of contamination and the need for the turnout gear ensemble to be isolated, tagged and bagged on the scene. The contaminated ensemble should be removed from service until the contaminated or suspected contaminant is identified and the ensemble elements can receive specialized cleaning as necessary to remove the specific contaminant(s).

Where possible and where the contaminant and its source have been identified, the Oswego Town Fire Department should consult the supplier of the contaminant and the manufacturer of the ensemble for an appropriate decontamination agent and process.

Turnout gear ensembles that are known or suspected to be contaminated with body fluids should be evaluated on the incident scene under the direction of the Senior Officer on scene by conducting a preliminary assessment of the extent of contamination and the need for the turnout gear ensemble to be isolated, tagged and bagged on the scene. Universal precautions should be observed at all times by members handling elements known or suspected to be contaminated with body fluids.

Soiled or contaminated elements should not be brought into the home, washed in home laundries or washed in public laundries.

Commercial dry cleaning should not be used as a means of cleaning or decontaminating ensembles unless approved by the ensemble manufacturer.

When contract cleaning or decontamination is used, the ISP should demonstrate, to the organization's satisfaction, that their procedures for cleaning and decontamination do not compromise the performance of the ensemble.

Members of the Oswego Town Fire Department should examine the manufacturer's label and user information for instructions on cleaning and drying the ensemble. The following describes the routine cleaning and drying information generally required by Turnout Gear ensemble manufacturers.

VII. ROUTINE CLEANING PROCESS

Where possible, the contamination levels should be evaluated and cleaning should be initiated at the emergency scene.

Ensembles should be isolated whenever possible to avoid cross contamination.

Any dry debris should be brushed off using the stiff brush(s) designated specifically for Turnout Gear cleaning. These brushes will be kept on a hook above the utility sink located next to the engine bay work bench.

Other debris should be gently rinsed off with water. Heavy scrubbing or spraying with high-velocity water such as a power washer should **NOT** be used.

Where necessary, Turnout Gear Ensemble Elements for routine cleaning should be cleaned in the **utility sink** located in the corner of the engine bay near the work bench which is designated for Personal Protective Equipment (PPE) cleaning and decontamination using the following best practices:

Heavily soiled or spotted areas should be pretreated. Chlorine bleach, chlorinated solvents, active-ingredient cleaning agents or solvents should **NOT** be used without the ensemble manufacturer's approval.

Water temperature for cleaning should not exceed 105 F degrees.

Mild detergents with a pH range of not less than 6.0pH and not greater than 10.5 pH as indicated on the cleaning product Material Safety Data Sheet (MSDS) or product container should be used. ERA Active Stain fighter Formula laundry Detergent meets the pH requirement.

Protective gloves and eye/face splash protection should be worn.

Elements should be thoroughly rinsed.

Elements should be inspected and, where necessary, should be rewashed or submitted for advanced cleaning. The manufacturer should be consulted if stronger cleaning agents are required.

Elements should be air dried by placing the element(s) in an area with good ventilation. Elements should not be dried in direct sunlight.

1. Helmet
    - If it is necessary to totally immerse the helmet, the impact cap should be separated from the helmet shell. Each component should be washed and dried separately before reassembly.
    - Solvents should not be used to clean or decontaminate helmets and helmet components. The helmet manufacturer should be consulted if stronger cleaning agents are required.
    - Helmets should not be machine dried using equipment that produces mechanical action from tumbling or agitation.
2. Gloves
    - Glove elements should not be machine dried using equipment that produces mechanical action from tumbling or agitation.
3. Hoods
    - Hood elements should be permitted to be washed and machine dried with garment liners.
4. Footwear
    - Footwear elements should not be machine dried using equipment that produces mechanical action from tumbling or agitation.

VIII. ADVANCED CLEANING AND DECONTAMINATION

Advanced cleaning should be performed by a verified ISP.

Advanced cleaning of ensemble elements should be completed per ensemble manufacturer's guidelines.

If the coat element has a Drag Rescue Device or Personal Safety System and they are removable, the Device/System should be removed prior to the turnout coat being laundered. If the Drag Rescue Device or Personal Safety System requires cleaning, it should be placed in a separate mesh bag for washing and drying.

Where turnout gear shells and liners of protective garment elements are separable, those items should be cleaned and decontaminated only with like items.

Separable liner systems should be turned inside out so the moisture barrier is on the inside for machine washing.

The following should be used for **machine washing**:

- The washing machine should not be overloaded
- Heavily soiled or spotted areas should be pretreated. Chlorine bleach, chlorinated solvents, active-ingredient cleaning agents or solvents should not be used without the ensemble manufacturer's approval
- All closured, including pocket closures, hooks and loops, snaps, zippers and hooks and dees should be fastened
- Water temperature for cleaning should not exceed 105 F degrees
- Mild detergents with a pH range of not less than 6.0pH and not greater than 10.5 pH as indicated on the cleaning product Material Safety Data Sheet (MSDS) or product container should be used. ERA Active Stain fighter Formula laundry detergent meets this requirement
- Washing machine manufacturer's instructions should be followed for proper setting or program selection for the specific element being washed
- The element should be inspected and rewashed if necessary
- Elements should be air dried by placing the element(s) in an area with good ventilation. Elements should not be dried in direct sunlight

IX. REPAIR OF ENSEMBLE ELEMENTS

All ensemble repairs should be performed by the original manufacturer, an ISP Ensemble elements include: turnout coat, liner, trousers, helmet, footwear, gloves and hoods.

X. STORAGE OF TURNOUT GEAR ENSEMBLES

Turnout gear ensembles and ensemble elements must be stored in clean, dry and well ventilated areas. Turnout gear ensembles and ensemble elements must not be exposed to extended periods of direct sunlight or fluorescent light when not being worn.

Turnout gear ensembles and ensemble elements will be stored in the turnout gear racks located in the rear of the engine bay when not in use, the exception being the Chief Officers who carry their turnout gear in their personal vehicle. Spare turnout gear ensembles will be maintained in the secure room located in the basement of the firehouse.

XI. RETIREMENT OF TURNOUT GEAR ENSEMBLES

Turnout gear ensembles and ensemble elements used for **Interior** Firefighting should be retired from **Interior** service 10 years after date of manufacturer.

XII. RECORD KEEPING

Records will be maintained in the Chief's Office (in a 3 Ring Binder) for all OTVFD owned Turnout gear ensembles and ensemble elements (See Appendix A). These records should include the following:

- Manufacturer's name and identification number (Lot or serial number)
- Month and year of manufacturer
- Name of the person whom the turnout gear ensemble and ensemble element was issued to
- Date of Advanced Cleaning
- Date of Advanced Inspection
- Date and description of repairs, name of person (Organization) performing repairs to the Turnout gear ensembles and ensemble elements
- Moisture barrier hydrostatic test date
- Date of Turnout gear ensemble and ensemble elements retirement
- Method of disposal for each retired Turnout gear ensemble and ensemble elements

APPENDIX A - FIREFIGHTING ENSEMBLE ISSUANCE RECORD

Records will be maintained in the Chief's Office by member name for all OTVFD owned Turnout gear ensembles and ensemble elements. These records should include the following:

Type: (circle one) Coat Pant Hood Glove Boots Rescue System

Manufacturer's name and identification number (Lot or Serial Number):

_____

Month and year of manufacturer:

_____

Name of the person issued to:

_____

Date of turnout gear issuance: _____

Date of Advanced Inspection: _____

Date of Advanced Cleaning: _____

Date and description of repairs, name of person (Organization) performing repairs to the Turnout gear ensembles and ensemble elements:

_____

_____

_____

Moisture barrier hydrostatic test date: _____

Date turnout gear ensemble retired from INTERIOR service: _____

Date of Turnout gear ensemble and ensemble elements retirement: _____

Name: _____

APPENDIX B - TURNOUT GEAR CLEANING FORM

Oswego Town Fire District Turnout gear cleaning form
To be filled out each time gear is washed and filed with the Chiefs Office.

Name: _____ Date: _____

Type of gear (circle one): Pant Coat

Tracking number: _____

Action taken (circle one): Machine washed Other: _____

Please check off all sections that were checked after cleaning:

___ No heavy soiling

___ No visible contamination

___ No rips, tears, cuts, mold or other contaminants.

___ All hardware securely in place

___ All closure systems operable

___ No charring, burn holes, discoloration

___ Reflective trim

___ Seam integrity

___ Drag Rescue device/Harness

I have cleaned/inspected this piece of turnout gear and have deemed it OK for putting back in service.

_____ _____

Signature of person completing task Date

APPENDIX C - MONTHLY RECORD KEEPING FORM

Complete gear inspection is to be completed on a monthly basis per Fire District policy.

By initialing below you certify that you have completed the monthly inspection of your complete firefighting ensemble and attest that all is in good operating condition. Anything found not in good condition should be reported to the Chiefs for repair/replacement.

Member Name: _____ Year of Inspection: _____

January: _____	February: _____	March: _____
April: _____	May: _____	June: _____
July: _____	August: _____	September: _____
October: _____	November: _____	December: _____

This form shall be mounted/stored in each individual locker at the fire station. Chiefs and those members carrying gear in their personal vehicles shall keep these forms at the fire station to ensure inspections have been completed.

Quick summary of what should be checked
Coat: soiling, contamination, rips, tears, cuts, thermal damage, reflective trim, seam integrity
Pants: soiling, contamination, rips, tears, cuts, thermal damage, reflective trim, seam integrity
Hood: soiling, contamination, rips, tears, cuts, seam integrity
Helmet: outer shell integrity, ear flaps, internal suspension, face shield/goggles, reflective trim
Gloves: soiling, contamination, rips, tears, thermal damage, shrinkage, seam integrity
Boots: soiling, contamination, rips, tears, leaks, thermal damage
Drag Rescue device: correct installation, soiling, contamination, thermal damage
Harness: correct installation, contamination, soiling, thermal damage
Rope system: soiling, contamination, rips, abrasions, thermal damage

APPENDIX D - YEARLY INSPECTION FORM

The Personal Protective Equipment (PPE) Checklist/Log is in a separate document on the OTVFD website (www.otvfd.com). Please use that document. Document is titled – PPE Checklist.