CLEANING IS A MUST:

· Your garment should be washed at least every six months or as soon as it has been soiled or contaminated. The bunker clothing will require more frequent washing depending on how extensively it is used and also on the nature of the incidents at which it is worn.

· Frequent cleaning reduces the health risk of exposure to toxins and contaminants...these are potential sources for rashes, irritations and possibly even skin cancer.

· Soiled garments reflect less radiant heat. Materials saturated with hydrocarbons will absorb not deflect radiant heat from a fire.

· Garments with hydrocarbons are more likely to conduct electricity which is a threat when there is any exposure to live wiring. This can lead to electrical shock.

· Soiled garments may actually be flammable and more likely to ignite.

· Soiled garments will not breathe as well. Moisture barriers get clogged up.

· Garments which are not cleaned frequently may wear out sooner. Chemicals, oils, gases and solvents if left in the clothing can weaken materials, thread and the visibility of the trim.

· Hosing down your bunker suit with the hose on a low pressure setting and/or scrubbing gently with a soft bristle brush and mild detergent right after the termination of an emergency can remove large amounts of contaminants before they set in.

· When washing bunker suits or other bunker apparel, avoid direct contact with skin. Bunker suits should be kept away from children because they like to touch, and there may be contaminants on the gear.

· Do not dry clean the bunker suit and do not use chlorine bleach.

· Follow the directions of the labels which are sewn into the garment.

In the Washing Machine

Washing

· It is best if home washing machines and public washing machines are avoided to prevent any possible spread of contamination.

· Pre-treat heavily soiled and/or spotted areas of the garment if necessary. Solvents such as Varsol can be used to remove stubborn debris such as tar and grease. Do not use these solvents on leather or reflective trim. Garments must then be washed to remove residual solvents because they may be flammable.

· Maximum water heat of 105 degrees Fahrenheit or a water temperature which is lukewarm is ideal. Some sources will suggest up to 130 degrees, but we have found that this can be hard on the retroreflective trim, moisture barrier seam tape and high heat may cause material shrinkage.

· Do not use liquid fabric softeners in the washing machine.

. Avoid a PH balance which is greater than 10.5.

. <u>Do not mix bunker gear with other clothing.</u>

· Do not pressure wash.

· If liners are detachable from the outer shells, they should be separated. This helps expose all parts of the suit more thoroughly to the washing process. Some people recommend that if it is possible, to wash the liner and outer shell separately so that the contaminants from the outer shell do not come in contact with the liner materials.

· Fasten all closures on the suit including snaps, zippers and Velcro. Sealing the Velcro helps prevent particles from sticking to it as well as helping the Velcro stay down on the suit longer without de-laminating. Another suggestion is placing the garments in a mesh laundry bag to reduce abrasion and damage to the garment and the laundry equipment.

· If the washing machine does not have a second rinse cycle, run an additional cycle without detergent to remove any residue from the washing machine.

SPOT CLEANING & PRETREATING:

Liquid Shout, Liquid Spray and Wash, Liquid Tide. Do not apply spot cleaners or solvents directly on the reflective trim, use mild detergents only.

Also, there are special bunker suit cleaning products in the fire industry that are available from distributors. With any specialty cleaning product, you should read the material safety data sheet (M.S.D.S.), follow the manufacturer's directions, and if applicable, check with third party agencies such as Underwriters Laboratories.

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DRYING

Drying your Bunker Gear :

· 2 key considerations when drying: a)time constraints b) minimize shrinkage

· If the liner in the gear is fully detachable, it should be separated. It takes approximately 6 times as long to dry the liner in a machine as it does the outer shell. The shells can be machine dried for a much shorter setting than the liners, (this is also better for the reflective trim).

· Whenever time permits, air drying instead of putting the garment in the dryer is the best method and is strongly recommended. There is little danger of shrinkage. Forced air from sources such as fans will speed up the drying process.

· If time is limited and you need to use a dryer, you should machine dry at a low temperature or delicate cycle setting, (not hot). Do not use fabric softeners in the dryer. Make sure as in the washing machine to seal all Velcro, and do up snap hooks and d-rings, zippers, snaps etc.

· Never dry (or store) the gear in direct sunlight because the U.V. rays can severely weaken the materials. Although fluorescent lights are not as great a source of U.V. rays, it is best if at all possible to store gear whenever possible in a dark area that is not excessively hot or cold.

Decontamination of Bunker Suits

Decontamination

· As opposed to general washing, bunker gear with hazardous materials or a high concentration of unknown materials require special handling.

a) Isolate the garments. Do not handle these garments directly without appropriate protective garments being worn.

b) If at all possible identify the contaminants.

c) Locate a professional company who can accomplish the decontamination.

d) If it is not possible to decontaminate the gear, proper disposal by a specialty clean up contractor is required.

e) General rule of thumb: if the decontamination procedure costs more than 50% of the garment's replacement cost, the garment should be replaced.

Contamination Involving Bodily Fluids

Contamination

· Remove the garment from the body.

· Isolate and bag the garment(s) according to federal, provincial/state and local regulations.

· Determine what type of cleaning procedure is necessary.

Note: If your department does not have a standard operating procedure with regards to contaminated garments, they need to consult with a local decontamination authority or health department official who is well versed in the field of decontamination of clothing. If such an authority is not easily accessible, please contact Starfield Safetywear.
As an additional reference, see N.F.P.A. standard 1581 (Infection Control Procedures).

Contract Cleaning

CONTRACT CLEANING:

· If you plan to send your clothing out to be cleaned, it's important to qualify the potential contract cleaner. Below are a few key questions to ask:

-What cleaning process do they use .... Are there material safety data sheets available. If it's a proprietary process, it should be approved by Starfield Safetywear.
-Does the cleaner have references for cleaning.
-Do they have liability insurance in the event of garments damaged in their laundry facility.
-Do they take reasonable precautions for preventing personal exposures while handling soiled garments.
-Are they familiar with N.F.P.A. requirements as well as other standards which the fire department may be working with.
-Do they use a proper tagging, tracking and recording system.

Storage

Storage of Bunker Gear:

· Proper storage practices can extend the bunker suit's life and reduce health risk

· As mentioned earlier, U.V. degradation especially from sunlight is the main cause of "unknown" suit failures .... it causes fabric strength loss, and degradation of fibers.

· Improper storage of wet/damp gear promotes growth of mildew and bacteria. This can lead to skin irritation, rashes and may also adversely affect materials' strength. The gear must be stored so that it properly dries after being worn.

· Wash and dry bunker suits that will be stored as inventory for potentially long periods of time.

· Avoid storage in the home or inside passenger seats in the car.

· The storage area should be clean and well ventilated.

Note: The bunker suit or coat or pants (or other protective equipment) should not be stored or worn in eating, living or sleeping areas. These items may have contaminants which may be spread in otherwise clean living areas. They should be left in an area specifically designated and built for protective clothing storage.

Inspection

INSPECTION:

· An inspection routine offers a sound means to document wear life progress and characteristics of the bunker suit. This can help determine the cause(s) of the gear wearing out.

· The decision to retire or repair the gear should be made by trained personnel.

· Inspection should be made: -once/month, -after cleaning, -after gear is damaged or decontaminated.

· It is important to clean the garment before inspection for safety reasons and also so that nothing can be masked by residue.

· Some things you are looking for when inspecting your gear include:

Char Itcat Damage: Areas afi;ected by this type of damage should be checked for strength loss- Check all 3 layers of the suit.

"Heat discoloration is characteristic of dyed aramid fabrics. The discoloration occurs long before the properties are affected by the heat. As a general rule, garments are considered safe to use as long as there are no charred areas or tears, and fabric cannot be tom by tugging with your hallds."
Lec l. ipxcond~. Oualitv Director, Southern Mills

Fabric Damage: Includes tears, cuts, abraded areas. Flex the material in the afibcted area, attempt to tear it, try and push your finger through this material.

Thread/Seam Damage: Look tbr skipped/broken/missing stitches.

Discoloration: Whether from heat degradation, U.V. exposure, chemical c(mtamination etc., check for severity of damage.

Reflective trim: Look for missing, burned or melted trim. Try a flashlight test whereby you shine the light in a darkened room from 20 - 40 feet away. If the

amount of light coming back at you is a lot less than on new trim, it is time to replace the trim or a section of the trim.

Cleanliness: Heavily soiled garments must be cleaned for the reasons outlined earlier.

Repairs

· Minor field repairs may be able to be made to the outer shell for small tears, char marks, minor trim repairs, abrasion damage, and broken stitches. As a general practice, it is best to call Starfield Safetywear before doing anything to the garment.

· You must use the same materials as those used by Starfield Safetywear, i.e. fabric, thread and hardware. In fact we strongly recommend that seam types, stitches/inch and manner of construction be consistent with those that we use.

· If you are unsure whether the repair would be consistent with our original construction, or whether the repair can be handled in the field, please contact us first.

· Major repairs should be done by us or a repair facility that is capable of making repairs consistent with both ours and the applicable standard(s).

· Repairs to the moisture barrier should not be done in the field because of the steps to ensure requirements for hydrostatic testing and also since all seams must be sealed in a specific way using a special seam tape and dedicated equipment.

· Minor repairs to the thermal barrier may be acceptable provided that there is no stitching through the moisture barrier. This also applies for repairs to the Velcro and reflective trim.

· For hardware and reinforcing, as mentioned before, use the same materials which we have used. If you are unsure of the material source, please contact Starfield Safetywear.

· Repair of major A seams (major outer shell seams) should be done by skilled people. If the repair is larger than 1" contact Starfield. Repairs of major B seams (major seams in the liner materials) should be done by ourselves or a specialized facility.

· Departments should document and detail repairs made to garments. It is a very good idea for your fire department if they have not already done so to set up a maintenance/cleaning log. This should reflect any inspections, cleaning and maintenance activity over the life of the garment.