



## **MONTHLY SAFETY BRIEF: FIRE-RETARDANT CLOTHING**

This safety brief provides a refresher for us on the use of Fire-Retardant Clothing and our associated safety policy (7.38).

As health and safety consultants, we find ourselves working in various industrial environments that require the use of fire-retardant clothing (FRC). Most common for our electrical/gas utility (i.e.: ComEd and WE Energies) clients, petroleum clients (i.e.: BP) and chemical manufacturers (i.e.: Kinder Morgan). There are also numerous other clients that have portions of their facilities that require the use of FRC. In most cases if not all, we are working in or adjacent to areas or equipment that have FRC requirements, and we are not conducting a specific task with a fire/explosion hazard (i.e.: arc flash associated with panel work). This policy is written from this perspective, for Hygieneering staff members to adhere to our clients FRC requirements based on their hazard analyses of their work environments. This policy is formatted as a training document on FRC basics (Part 1) and specific Hygieneering procedures that employees must follow concerning FRC (Part 2).

### **7.38 FIRE-RETARDANT CLOTHING**

#### **Fire-Retardant Clothing (FRC) Policy: Part 1 – FRC Basics**

##### ***OSHA Requirements Concerning FRC***

The following OSHA mandates govern the use of FR clothing:

- General Duty Clause. Section 5(a)(1) – you should be familiar with this general requirement!
- OSHA 1910.132 "Personal Protective Equipment" requires employers to assess the workplace for hazards and, if present, select and have each affected employee use the appropriate PPE. For this policy, we are relying on our client's hazard assessments and implementing the FRC requirements for the work environments at their facilities.
- There are other specific regulations concerning the electrical power industry and electrical work practices which are beyond our need, as we perform no electrical work.

##### ***Primary Hazards that FRC Protects Against:***

Most FRC has been designed to protect workers from two specific types of hazards: flash fire and electric arc flash. A flash fire is a rapidly spreading fire caused by igniting an atmosphere derived from hydrocarbon vapors of an ignitable liquid or finely divided combustible particles (e.g., coal dust or grain) in a concentration exceeding the chemical's lower explosive limit. Temperatures can reach 1,000 degrees F to 1,900 degrees F.

An electric arc flash is the passage of substantial electrical current through ionized air, created by an electric fault. Typically lasting less than one second, an arc flash explosion generates extremely high radiant heat and releases acoustical energy, a pressure wave, and molten debris. Temperatures can reach 35,000 degrees F.

Flash fire is a primary hazard in industries that create a combustible material as a product or byproduct, such as petrochemicals or metallurgy. Arc flash is an obvious concern at electrical utilities; however, any work environment with qualifying electrical hazards needs to guard against arc flash injury with the proper FR garments. Exposed electrical equipment at 50 volts and above is the threshold that requires the use of NFPA 70E's electrical safety practices.



FR clothing protects the wearer through the following attributes:

- Self-extinguishes or resists ignition
- Does not melt onto skin
- Provides thermal insulation from heat
- Resists breaking open and exposing skin
- Reduces burn injury and increases chances of survival

NOTE: Most severe burn injuries and fatalities are caused by non-FR clothing igniting and continuing to burn.

### ***Proper Use of FRC***

Be aware that if FRC is worn improperly – it will not be as effective to protect you when needed. The following are specific mistakes concerning wearing FRC you need to AVOID:

- WEARING IT WITH A NON-FR OUTER LAYER - In bad weather, it may be tempting to wear a non-FR jacket over your regular FR clothing. Even if you are wearing flame-resistant clothing, a non-FR outer layer can still ignite and burn, putting you in danger. When faced with cold weather conditions, it is important to invest in the proper FR outerwear.
- WEARING IT WITH A NON-FR SYNTHETIC UNDER LAYER - Performance t-shirts made from polyester or other synthetic materials are often worn to help with moisture management, but they are not flame resistant and can actually melt to the skin.
- ROLLING UP SLEEVES - Rolling up your sleeves may seem like the perfect way to beat the heat, however, this leaves the arms exposed and is prohibited. Instead, look for FR clothing made with lightweight, moisture-wicking fabrics that provide a greater level of comfort without sacrificing safety.
- UNZIPPING COVERALLS OR UNBUTTONING SHIRTS - Just like rolling up your sleeves, unzipping or unbuttoning FR clothing can expose the skin or (as noted above) a non-FR under layer that could ignite and burn.
- NOT TUCKING IN SHIRTTAIL - If the tail of your shirt is not properly tucked in, heat and flames can travel under the bottom of it and cause greater injury. Invest in FR clothing that's purposely constructed with long shirrtails to prevent this from happening.

In summary, make sure your FR clothing is in compliance and ready to keep you safe, remember to wear FR outerwear, avoid synthetic under layers, and roll it down, zip it up and tuck it in!

### **Fire-Retardant Clothing (FRC) Policy: Part 2 – Hygieneering FRC Procedures**

The following bullets outline our procedures:

1. If your job requires the use of FRC, you will be fitted and provided appropriate FRC coveralls (or jacket and pants). Your undergarments must consist of 100% natural fibers (cotton, silk or wool). Never wear clothing under garments that contain logos, screen prints, etc.
2. This FRC will become part of your PPE to maintain properly so it is ready for use when needed.
3. Selection of the appropriate type of FRC will be up to the project manager and dependent on the client site you are working. You should confirm with your project manager and the client contact/client policy that the FRC provided is appropriate for the application on each project you work, especially when going from one client site to another client site from different industries.
4. You should don your FRC appropriately as described in Part 1 of this policy.
5. You should store your FRC appropriately in accordance with the manufacturer's recommendations and in a dry location out of direct sunlight. Do not store wet.



6. Soiled or stained FRC shall not be worn. Proper laundering of FRC is necessary to maintain its characteristics. Hygieneering will provide laundering as required through a professional dry-cleaning service. Hygieneering staff should not launder their own FRC. Provide it to your project manager if cleaning is necessary.
7. You should visually inspect and make sure your FRC is in good condition prior to each use.

The Hygieneering FRC Replacement Policy is as follows:

The following items, identifiable by visual examination, may diminish the effectiveness of FR workwear and will be removed from service. Hygieneering employees are responsible for inspecting their FRC and informing the Project Manager if any of the following applies or any other FRC concerns that you may have:

- Worn appearance – Replace garments that have thin spots, holes, or excessive wear and abrasion, such as elbow or knee areas that can no longer be repaired.
- Mechanical damage – Evidence of cuts, rips, tears, open seams and nonfunctional closures that can no longer be repaired indicate a garment needs to be replaced.
- Noticeably altered – Garments that have been modified or altered in a manner that differs significantly from the original design should be removed from service.
- Improper fit – If the garment is either too big or too small for the wearer, it should be replaced. If the garment is too big it can be a physical hazard, and if the garment is too small it loses some of its thermal protection. FR clothing should have a looser fit to allow the air gap between the wearer and the garment to help with insulation.
- Heavily soiled – If there are flammable substances on a garment that cannot be removed by cleaning – such as solvents, solids, oils and other petroleum products – those substances represent a flammability risk.
- FRC utilized for ARC Flash protection should have the HPTV rating visible on tag. If not present, do not use.



### Fire-Retardant Clothing Policy Safety Quiz

1. Improper laundering or care of FRC could affect the fire-retardant properties of the FRC.  
 True  
 False
2. It is fine to wear your super cool Bon Jovi silkscreen t-shirt under your FRC.  
 True  
 False
3. All of the following can affect the protection performance of the FRC, except:
  - a. Improper fitting FRC
  - b. A tear in the FRC
  - c. The color of the FRC
  - d. An open zipper on the FRC
4. If your FRC becomes heavily soiled on a job site, you should:
  - a. Wash it in hot water with a degreaser agent.
  - b. Wash it in cold water and do not use bleach or anything other than standard soap as not to affect the fire-retardant properties of the material.
  - c. Turn in your FRC to your Project Manager for proper cleaning.
  - d. Throw it away and request new FRC.
5. FRC has the following attributes, except:
  - a. Self-extinguishes or resists ignition
  - b. Does not melt onto skin
  - c. Will not burn under any conditions
  - d. Provides thermal insulation from heat

**SCORE: PASS / FAIL**

\_\_\_\_\_  
Employee Signature

\_\_\_\_\_  
Supervisor Signature

\_\_\_\_\_  
Date