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PPE Update

How to photograph firefighter PPE

When investigating a firefighter injury or death, documenting the condition of the PPE is critical; that includes a visual record

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When firefighters are injured or killed their protective clothing is often inspected as part of the investigation. These inspections can provide useful information for how the clothing might have been worn as well as provide some insight as to the fireground exposure the firefighter encountered.

Therefore, undertaking a methodical and comprehensive examination of the clothing and equipment is an important process of any investigation and the photographs that are taken form a significant portion of its documentation.

There are procedures for clothing items covered by NFPA 1971 that are especially useful in fully photo-documenting a clothing inspection. Additional procedures apply to the inspection of self-contained breathing apparatus and PASS device. These items can be subjected to detailed assessment through the NIOSH Fire Fighter Fatality Investigation Program.

General information on the turnout clothing inspection process is provided in the chapter on inspection in NFPA 1851, Standard on Selection, Care, and Maintenance of Protective Ensembles for Structural Fire Fighting and Proximity Fire Fighting. However, no guidance is given for what images to capture as part of an investigation.

For those not wanting to conduct their own investigation, many PPE manufacturers have both the capabilities and willingness to do it.

Solid background

For those departments examining protective clothing worn by a firefighter following a serious injury or fatality, it is important to have a suitable inspection area and the right equipment. While it is

sometimes convenient to have clothing laid out on a table, having the items on the floor provides a better perspective for taking overhead photos.

Use some form of uniform contrasting background material on the inspection surface that fully fills the camera view. This can be butcher paper or a plain bed sheet that will not distract from the subject of the photographs.

This underlying material also helps to collect any small bits of debris that may come off the clothing when inspected.

Cell phone cameras generally provide high-quality photographs. However, a conventional 35mm SLR camera is still the better tool, especially when equipped with a lens that provides a wide focal range for adjusting the item image within the frame. These cameras further allow interchangeable lenses for close-up photographs as needed.

Accompanying tools include a 12-inch ruler for a sense of scale within certain photos, a tape measure (for locating areas of damage), a small flashlight, painter's tape and a notepad for taking notes. When doubled up, the tape can hold down labels or other features that do not lay flat.

Helmets and hoods

There is no particular order of inspection to follow. However, it is best to start with the simpler items beginning with the helmet.

The photograph sequence is relatively straightforward: front, left side, back, right side, top and interior. This captures the primary views of the helmet, but additional pictures are often needed to focus on specific areas of damage — such as close-ups of a melted faceshield or the deterioration of an edge beading on the helmet brim.

It is relatively difficult to take photographs of helmet labels that are on the interior of the shell, but the suspension straps can often be pushed to the side to get the shot. One area that deserves special attention is the ear covers; their location and discoloration can be a sign of whether or not they were deployed during the fire.

Hoods are perhaps the easiest to photograph. Shoot both a front and rear view.

It is also important to photograph the hood label, which is generally on the bib interior. These labels may be printed on both sides and the masking tape can be useful for keeping it flat.

As with other items, close-ups of damaged areas such as charring or tears can document specific effects of the fireground. If a hood is particularly discolored or stretched out of shape, a side-by-side photograph with a new hood provides a good comparison.

Gloves and boots

Gloves are photographed with both left and right gloves laid next to each other on their palm and back sides. Turning a portion of the wristlet or gauntlet inside out will expose a limited view of the

glove interior, but generally there are few photographic opportunities for documenting the condition of the gloves.

Labels for gloves, which tend to be double-sided hangtags, also need to be photographed — the tape is useful to get a close-up of the label content. Take close-up photographs of specific damaged areas such as burn marks or adhered fireground debris.

A perspective on any glove shrinkage can be obtained by shooting a new glove alongside the old glove, but both the gloves must be the exact same model and size.

For footwear, the routine photographs include both left and right sides of both boots along with pictures of the bottom outer sole and the labels. For these pictures, lay the boots on their sides for better photographs.

Since the footwear labels are on the interior of the upper shaft, the boot has to be positioned to allow the camera shot to capture the printed content. A small flashlight is sometimes useful for this part of examination.

Additional photographs are usually needed to provide close-ups for specific areas of damage that can include loss of outer sole bottom tread and physical penetrations of the boot materials.

Pants and Coats

Both pants and coats require more photographs to document their condition. Similar approaches are used for both items. Shoot the exterior front and back views with the pants laying perpendicular to the camera but with straight on shots for coats.

Take additional pictures to provide close-ups of particular areas of damage that can involve a myriad of conditions. Most commonly, these include deteriorated reflective trim, areas of outer shell charring or embrittlement, heavily soiled or debris-laden areas, broken hardware or melted hook and loop closure tape. Identify specific areas of damage by laying the ruler along a damaged area to provide perspective.

If the coat and pants are in reasonable condition and extensive manipulation will not result in their further damage, photograph various parts of the interior.

However, if there is substantial charring, particularly embrittlement, and handling causes the clothing to fall apart during the examination, skip these additional steps.

Liners and shell interiors

For interior photography, remove the liner from the shell and turn the shell inside out to take front and back photos. These views are particularly helpful because it is relatively easy to see thermal damage in the absence of heavy soiling that obscures its discrimination on the clothing exterior.

Take similar steps for the liner, starting with the moisture barrier side, front and back, followed by inversion of the liner to show front and back views of the thermal barrier side (the part of the clothing

that faces the wearer). Take close-up photographs of extreme soiling or where heat has penetrated and damaged these layers.

Many coats and pants have an inspection port to view the liner's interior. These ports allow the liners to be turned inside out, but the inverted liner does not lay flat and it is difficult to get ordinary front and back views.

Nevertheless, it is possible to photograph the condition of the film side the moisture barrier as well as any reinforcements on the interior the liner. Pay specific attention to the integrity of the moisture barrier seams and whether there is extreme pilling or degradation of the batting material that forms the primary bulk of the thermal barrier.

This approach can typically result in anywhere from 30 to more than 60 photographs depending on the amount of damage and needs of the investigation.

Yet, this provides a level of detail that fully documents the condition of clothing and can allow others to get a sense for its appearance without having to conduct their own investigation to assist in the overall evaluation.


About the author

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Jeffrey and Grace Stull are president and vice president, respectively, of International Personnel Protection, Inc. They are members of several NFPA committees on PPE as well as the ASTM International committee on protective clothing. Mr. Stull was formerly the convener for international work groups on heat/thermal protection and hazardous materials PPE as well as the lead U.S. delegate for International Standards Organization Technical Committee 94/Subcommittees on Protective Clothing and Firefighter PPE. They participate in the Interagency Board for Equipment Standardization and Interoperability and have authored the book, "[PPE Made Easy](#)." Send questions or feedback to the Stulls via [email](#).

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