

## Interpretation of the Electrical Safety Committee – July 2006

### Substituting for Flash Hood for 2\* Energized Work

#### Summary

NFPA 70E indicates that for operations under Hazard/Risk Category 2\* all PPE specified for Hazard/Risk Category 2 must be followed with the substitution of a double-layer switching hood for face and head protection to provide full protection.

The LESC accepts as an equivalent system the specific system consisting of the Salisbury 10 cal/cm<sup>2</sup> Model AS1000FS Hard Hat with Faceshield and chin cup used with the 10 cal/cm<sup>2</sup> AFHOOD 10 Nomex-Lenzing Balaclava/Racing Hood tested in Appendix 1. The results of this report were reported at the IEEE Electrical Safety Meeting, February 2006.

Other combinations must be submitted to the Laboratory Electrical Safety Officer for evaluation and submittal to the full LESC for approval.

#### Relevant Codes Sections

##### NFPA 70E Article 130, Table 130.7©(9)(A) Notes

2\* means that a double layer switching hood and hearing protection are required for this task in addition to the other Hazard/Risk Category 2 requirements of Table 130.7©(10)

#### Discussion / Analysis

Workers have expressed that the single double layer switching hood provides less visibility and comfort than the balaclava hood/face shield combination. Thus to facilitate tasks performed under Hazard/Risk Category 2\* and reduce potential accidents caused by the reduced visibility of the switching hood it is desirable to approve an equivalent protection system that improves comfort and visibility. Based on discussions with NFPA panel members and the equipment manufacturer indicated in Appendix 1 for which the tests were performed equivalent performance can be achieved to the double-layer switching hood by use of a hard hat and face shield and balaclava hood combination that achieves adequate FR rating to withstand the incident energy of a Hazard/Risk Category 2 exposure and provide adequate overlay of the face shield and hood to ensure the face is properly protected. While the FR rating is easily achieved, the key is to ensure that if the face is turned that there be no angle to the flash for which adequate coverage of the face and neck is not provided by the overlap of the hood and face shield.

The following comments comes from a Email correspondence between two NFPA 70E panel members who are DOE contractors, Keith Schuh, (FNAL) and Bobby Gray (Hanford):

*I'm going to follow the information below. It is from Hugh Hoagland. Based on the study I believe it provides enough protection. If we see this proposal in committee will look at the substantiations carefully. I caution the users that this is for a specific combination of PPE that has been **TESTED not just anything off the shelf.***

## Interpretation of the Electrical Safety Committee – July 2006

*The NFPA 70E standard requires the use of a "double layered switching hood" for performing HRC2\* work but this is undefined by the standard. It reasonably differs from a "flash suit hood", which is defined, or one may use a "flash suit hood in lieu of the "double layered switching hood". Classically utilities and some industrial companies have used balaclava hoods for switching. Many companies have used them under a face shield and I have investigated accidents in which they were completely protective. I recently presented a paper at the Electrical Safety Workshop in Philadelphia on this subject and have further details. The paper indicates that a balaclava which meets 8 cal/cm<sup>2</sup> did not show burn from a side, back and a 60 degree angle assault from an electric arc. The study further indicates the possibility of using a balaclava and faceshield up to HRC3 and possibly HRC4. This use would require a rewriting of the NFPA 70E standard but is hopeful for much greater comfort for future workers. This study is available by e-mail. This will be presented to the NFPA 70E committee for their review in an upcoming TIA and for clarification in the NFPA 70E standard. A big thanks to Salisbury for their sponsorship of this testing. Reports are also available through W.H. Salisbury. [www.whsalisbury.com](http://www.whsalisbury.com)*

The following comes from the ArcWaeer.com web site published by Hugh Hoagland, a recognized expert in FR clothing who has regularly present at the DOE and IEEE Electrical safety committee.

### ***Burn Up The Myth: Can I use a Faceshield With a Balaclava to meet HRC2\*?***

*QUESTION: Can I use a balaclava under my faceshield for Hazard/Risk Category 2\*. The standard isn't clear about what I need to protect my workers. They hate wearing the hood so much.*

*ANSWER: The NFPA 70E standard requires the use of a "double layered switching hood" for performing HRC2\* work but this is undefined by the standard. It reasonably differs from a "flash suit hood", which is defined, or one may use a "flash suit hood in lieu of the "double layered switching hood". Classically utilities and some industrial companies have used balaclava hoods for switching. Many companies have used them under a faceshield and I have investigated accidents in which they were completely protective. I recently presented a paper at the Electrical Safety Workshop in Philadelphia on this subject and have further details. The paper indicates that a balaclava which meets 8 cal/cm<sup>2</sup> did not show burn from a side, back and a 60 degree angle assault from an electric arc. The study further indicates the possibility of using a balaclava and faceshield up to HRC3 and possibly HRC4. This use would require a rewriting of the NFPA 70E standard but is hopeful for much greater comfort for future workers. This study is available by e-mail. This will be presented to the NFPA 70E committee for their review in an upcoming TIA and for clarification in the NFPA 70E standard. A big thanks to Salisbury for their sponsorship of this testing. Reports are also available through W.H. Salisbury. [www.whsalisbury.com](http://www.whsalisbury.com)*