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Regarding: NSLS-II: ISS (8-ID-B) Beamline Hutches containing hazardous materials

To Whom It May Concern:

This letter documents the Fire Protection Engineering review and approval wherein the ISS (8-ID-B) beamline hutch does not require fire sprinkler protection at the ceiling of the hutch, as required by code, but at each point in the hutch where a realistic release of the hazardous gases is probable. This sprinkler strategy along with complying with the criteria outlined in Record of Review (ROR 2015-1) and the mitigating safety features provided allows this installation to meet the intent of the code.

**Background:** The Fire Code of NYS (2010 ed.) and NFPA 13 (Standard for the Installation of Fire Sprinklers – 2013 ed.) require the installation of fire sprinklers throughout all areas of NSLS II, including the experimental hutches. Photon Sciences requested relief from the sprinkler requirement for experimental hutches based upon the limited combustibility of the hutch contents and fire loss record. Fire Protection Engineering conducted a thorough analysis of the fire potential including computer-based fire modeling simulations. The results showed that the hutches have a fire hazard equivalent to an “electrical room” which, as defined in the Codes, are areas allowed to omit fire sprinklers. A Record of Review (ROR 2015-01) was submitted and approved by BHSO granting relief from installing fire sprinklers in “hutches without hazardous materials”. The ISS (8-ID-B) beamline hutch will contain hazardous materials and do not meet the requirements of the ROR equivalency for the omission of fire sprinklers.

Within this hutch, hazardous gases are conveyed from the gas cabinets through double walled piping to the experimental process equipment and sample chamber that then discharges into the building hazardous exhaust system. Mitigating safety features include automatic hazardous gas supply shutoff with loss of power, exhaust flow, gas detector activation, and pressure monitoring inside the double walled piping and sample chamber.

**Determination:** Utilizing the proposed hutch configurations, plausible release scenarios were developed and analyzed based upon both internal and external fire and release scenarios. Protection from fire-induced hazardous gas release can be accomplished by installing fire sprinklers directly at the point of hazard in lieu of general area (ceiling) coverage.

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