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Cryogenic oxygen deficiency hazard assessment at the National Synchrotron Radiation Research Center

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The National Synchrotron Radiation Research Center (NSRRC) uses cryogenic fluids to create a low-temperature cooling environment for equipment and to conduct various experiments. However, exposure to these cryogenic fluids can cause frostbite, hypoxic suffocation, behavioral incapacitation, insanity, and even death in severe cases. To evaluate oxygen deficiency hazard (ODH) in the NSRRC, we adopted the Fermilab assessment methodology and conducted ODH assessments in the Cryogenic Compressor Room, Taiwan Light Source (TLS) Tunnel, and TLS15A hutch. The results of the evaluation of the Cryogenic Compressor Room and TLS Tunnel revealed that the ODH class is 0 both when the exhaust fan is operating normally and when the exhaust fan is damaged. The exhaust equipment in the TLS15A hutch is only for emergency use. Without the emergency exhaust fan, the ODH class in the area is 1. If the emergency exhaust fan is always on, the ODH class is 0. Therefore, we recommend that those in TLS15A should undergo safety education and receive hazard notifications. In addition, we strongly recommend installing oxygen detectors in the beamline hutch to ensure safety.

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Footnotes

I have read and accept the Privacy Policy Statement

Yes

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