NSF Standard(s) Impacted: Standard 49 – Biosafety Cabinetry: Design, Construction, Performance and Field Certification

Background: Provide a brief background statement indicating the cause and nature of concern, the impacts identified relevant to public health, public understanding, etc, and any other reason why the issue should be considered by the Committee. Reference as appropriate any specific section(s) of the standard(s) that are related to the issue.

History

The 1992 version of Standard 49 included electrical leakage, ground circuit resistance and polarity tests in both Annex A Section XIV and as test F of Annex F. Section 5.14 of the main body Standard 49 had the following requirement: “ELECTRICAL LEAKAGE, GROUND CIRCUIT RESISTANCE AND POLARITY: The electrical leakage shall not exceed 500 ma and the ground circuit resistance shall not exceed 0.15 ohms. Cabinets with primary-circuit filtering complying with UL 1262 shall be considered complying with this requirement.”

By 2002, the electrical safety requirements in section 6.14 of Standard 49 stated simply: “The cabinet shall meet UL 3101-1”. No electrical safety test methods were referenced in Annex A of the 2002 version of the standard. Annex F, section F.8 stated “All new cabinets shall comply with UL 3101-1. Older cabinets may refer to NSF 49 – 1992 for Electrical Leakage, Ground Circuit Resistance, and Polarity tests if necessary.”

By 2009, UL 3101-1 was replaced with UL 61010-1. Section 6.14 stated “The cabinet shall conform to the requirements of UL 61010-1 or current edition.” Annex F stated “All new cabinets shall conform to UL 61010-1 or current edition. Cabinets initially qualified under versions of NSF/ANSI 49 prior to the 2009 edition shall conform to UL 61010A-1 or may refer to NSF 49 – 1992 for Electrical Leakage, Ground Circuit Resistance, and Polarity tests if necessary.”

Status of Electrical Safety Requirements in Standard 49 Today

Standard 49 currently references “any national standard based on IEC 61010-1” Annex F states “All new cabinets shall conform to the requirements of the current edition of any national standard that is based on IEC 61010-1. Cabinets initially qualified under versions of NSF/ANSI 49 prior to the 2009 edition shall conform to UL 61010A-1 or may refer to NSF 49 – 1992 for Electrical Leakage, Ground Circuit Resistance, and Polarity tests if necessary.”

In 2012, a task group was formed to discuss rewriting Annex F to include electrical safety tests specific to individual biosafety cabinet installations. The task group was founded based on the following principles:

- The electrical leakage test will ensure the cabinet’s three-wire grounding power cord prevents shock hazard by grounding the metal parts of the cabinet. It is required to be within a specified limit for shock prevention.
- The ground circuit resistance test ensures that continuity and resistance of grounding systems are secure and functioning per design.
- The purpose of testing the cabinet’s electrical polarity is to ensure the electrical supply hot, neutral, and ground are properly wired (at both the electrical supply to the cabinet and within the cabinet’s electrical wiring circuits).
Recommendation:
Clearly state what action is needed: e.g., recommended changes to the standard(s) including the current text of the relevant section(s) indicating deletions by use of strike-out and additions by highlighting or underlining; e.g., reference of the issue to a Task Group for detailed consideration; etc.

I recommend that the task group that was originally formed to review the electrical safety requirements in Annex F reconvene with the objective of determining whether individual electrical safety tests should be performed on biosafety cabinets in the field as part of each field certification and if so, how detailed should Annex F be? Is it possible that the initial certification of a biosafety cabinet model to IEC 61010-1 is not sufficient to address all electrical safety concerns that arise in the field?

Supplementary Materials (photographs, diagrams, reports, etc.):
If not provided electronically, the submitter will be responsible to have sufficient copies to distribute to committee members.

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