TO: Joint Committee on Drinking Water Treatment Units

FROM: Dr. Robert Powitz, Chair of the Joint Committee

DATE: July 21, 2020

SUBJECT: Proposed revision to NSF/ANSI 55 – Ultraviolet Microbiological Water Treatment Systems (55i51r1)

Revision 1 of NSF/ANSI 55, issue 51 is being forwarded to the Joint Committee for consideration. Please review the proposal and submit your ballot by August 11, 2020 via the NSF Online Workspace <www.standards.nsf.org>.

When adding comments, please identify the section number/name for your comment and add all comments under one comment number where possible. If you need additional space, please upload a word or pdf version of your comments online via the browse function.

Purpose

The proposed revision will add clarifying language to Sections 7.2.2.5.1 and 7.3.1.5.2, indicating that the maximum allowable UVT of 70% only applies to Class A systems. The mean absorption values were also corrected to be consistent with the current edition of Standard Methods for the Examination of Water and Wastewater, Method 5910: UV Absorbing Organic Constituents.

Background

Sections 7.2.2.2 and 7.3.1.2 provide the performance requirement for Class B systems, and state that the lamp output shall be lowered to 70% of the normal output, or the system shall be tested at the alarm set point if the system is equipped with a UV sensor and alarm.

7.2.2.5.1 and 7.3.1.5.2 are entitled Systems with UV sensor and alarm set point, and state UV absorbent shall be used to lower the UV transmission (UVT) to the alarm set point. Both sections then go on to state that no less than the quantity of absorbent required to give a mean UV absorption of 0.30 per cm (70% UVT) shall be used.

It is understood that the maximum allowable UVT of 70% only applies to Class A systems. Class B systems are for supplemental treatment of a microbiologically safe water source for the reduction of nuisance bacteria only. Therefore, it should not be required to test a Class B sensor/alarm UV system with a UVT of 70% or less. If the system alarms at a higher UVT, the system should be tested at that higher UVT. It was also noted that the current mean UV absorption value should be updated to be consistent with the current edition of Standard Methods.

This issue was presented at the 2020 DWTU JC meeting and was unanimously approved for balloting. Please see the original issue paper (DWTU-2020-9) and the 2020 JC meeting summary excerpt under the referenced items for additional background information.
If you have any questions about the technical content of the ballot, you may contact me in care of:

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NSF/ANSI Standard for Drinking Water Treatment Units –

Ultraviolet Microbiological Water Treatment Systems

7.2.2.5.1 Systems with UV sensor and alarm set point

Sufficient PHBA shall be added to reduce UV light transmission to the alarm set point of the device. For Class A devices, no less than the quantity of PHBA required to give a mean UV absorption of 0.155 per cm (70% UVT) at 254 nm shall be used.

NOTE — Absorption = -log(\%T/100) where \%T is expressed as a percentage (70%). Refer to Standard Methods for the Examination of Water and Wastewater, Method 5910 UV Absorbing Organic Constituents.

7.2.2.5.2 Measurement of normal output for Class B systems without UV sensor and alarm set point

The following procedure shall be used to measure the normal output:

a) Two bulb and ballast components identical to the system's bulb and ballast component shall be installed into a container coated with material that does not reflect UV radiation. The container shall be large enough to allow for measurement of the UV intensity at 1.0 m (3.3 ft).

b) A regulated voltage source shall be set at the manufacturer’s minimum recommended voltage.

c) The lamp shall be operated for 100 h and record the intensity at 1.0 m (3.3 ft).

d) The voltage to the lamps shall be reduced until the irradiance reaches 70% of normal output measured at 100 h. The voltage and intensity shall be recorded.

e) The lower of the two voltage reductions shall be used to adjust the system to 70% of its normal output.

7.3.1.5.2 Systems with UV sensor and alarm set point
Sufficient UV absorbant shall be added to reduce UV light transmission to the alarm set point in of the device. For Class A devices, no less than the quantity of UV absorbant required to give a mean UV absorption of 0.300.155 per cm (70% UVT) at 254 nm shall be used.

NOTE — Absorption = -log(%T/100) where %T is expressed as a percentage (70%). Refer to Standard Methods for the Examination of Water and Wastewater, Method 5910 UV Absorbing Organic Constituents.

7.3.1.5.3 Configuring Class B systems without UV sensor and alarm set point for evaluation

Two methods are available to prepare a Class B system for evaluation. These methods both effectively simulate the UV source irradiance at end of life (70% of initial output at 100 hours). The procedure under Section 7.3.1.5.3.1 shall be the default procedure. Section 7.3.1.5.3.2 shall be utilized if the system is conducive to this procedure and is requested by the manufacturer.

Rationale: Revised per 2020 DWTU JC meeting discussion (May 13, 2020). The maximum allowable UVT of 70% only applies to Class A systems. Class B systems are for supplemental treatment of a microbiologically safe water source for the reduction of nuisance bacteria only. Therefore, it should not be required to test a Class B sensor / alarm UV system with a UVT of 70% or less. If the system alarms at a higher UVT, the system should be tested at that higher UVT.