TO: Joint Committee on Wastewater Technology

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

DATE: September 7, 2022

SUBJECT: Proposed revision to NSF/ANSI 385: *Disinfection Mechanics* (385i11r2)

Revision 2 of NSF/ANSI 385, issue 11 is being forwarded to the Joint Committee for consideration. Please review the proposal and **submit your ballot by September 28, 2022** via the NSF Online Workspace <www.standards.nsf.org>.

Please review all ballot materials. When adding comments, please include the section number applicable to your comment and add all comments under one comment number whenever possible. If you need additional space, please use the attached blank comment template in the reference documents and upload online via the browse function.

Purpose

This ballot will revise the MOD dosing chart in Section 6.5.3.1.1 in NSF/ANSI 385.

Background

An issue paper submitted notes the table in Section 6.5.3.1.1 needs reconsideration. The highlighted portions below in the row "Purge 2" contradict each other about the appropriate chlorine feed rate during a variable feed Microbiological organism deactivation (MOD) test. In both cases, the dosing for Purge 2 is either a best-case scenario for the maximum flow rate, or a duplicate test of Hours 0 to 3.

The table in Section 6.5.3.1.1 currently reads:

Hours 0 to 3	Device set to the chlorine feed rate used during the life test with wastewater flow set to the flow rate required to deliver 40% of the maximum flow capacity over the 3-h period (same as evening dosing during life test).
Purge 1	Purge contact chamber for a minimum of one chamber volume with wastewater flow set to the flow rate required to deliver 40% of the minimum flow capacity over a 3-h period. The device shall be set to deliver minimum chlorine feed specified by the manufacturer for the minimum flow capacity during this purge.
Hours 3 to 6	Device set to deliver minimum chlorine feed specified by the manufacturer for the minimum flow capacity with wastewater flow rate set to the same rate used in Purge 1.
Purge 2	Purge contact chamber for a minimum of one chamber volume with wastewater flow set to the flow rate required to deliver 40% maximum flow capacity over a 3-h period for the maximum feed rate. The device shall be set to deliver the minimum chlorine feed specified by the manufacturer for the maximum flow capacity during this purge.
Hours 6 to 9	Device set to deliver the same chlorine feed and wastewater flow used in Purge 2.

The issue proponent suggested 3 possible paths forward:

1. The Task Group clarifies the section with one of the two current options.

- If we assume the first highlighted section is correct: (maximum chlorine feed rate)
  Then the MOD test performed is a best-case scenario, for the maximum flow capacity.
  - Hours 0 to 3: 40% maximum flow w/ minimum feed
  - Hours 3 to 6: 40% minimum flow w/ minimum feed
  - Hours 6 to 9: 40% maximum flow w/ maximum feed

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- If we assume the second highlighted section is correct: (minimum chlorine feed rate)
  Then the MOD test repeats the same flow/feed setting as the first sampling occasions.

- Hours 0 to 3: 40% maximum flow w/ minimum feed
- Hours 3 to 6: 40% minimum flow w/ minimum feed
- Hours 6 to 9: 40% maximum flow w/ minimum feed

2. Completely remove the “Purge 2” and “Hours 6 to 9” rows from the table.

   This is a valid proposal since nether options provides relevant data for evaluating the treatment limitations of a chlorine disinfection device.

3. Replace the 40% maximum flow capacity with 10% minimum flow capacity.

   This option would mimic the fixed feed rate table and would give more pertinent data evaluating the treatment capabilities as it is a worse-case scenario.

   This issue paper was presented at the 2022 Wastewater Technology Joint Committee meeting, and a motion to send the language to Task group for language development was approved. The WWT Task Group on NSF/ANSI 385 reviewed the paper and agreed to send language along the lines of option 2 to straw ballot after the issue proponent reviewed other sections of the standard. In the review, the issue proponent discovered an alternate option that seemed to more closely match the original intent, and drafted r1 language that was sent as a straw ballot to the Task group. A comment received on that ballot noted that the Purge 2 and Hours 6 to 9 tests were redundant as written, and suggested modifications. The issue proponent agreed, and the r2 language presented here after a follow up straw ballot incorporates changes based on the comments received.

   If you have any questions about the technical content of the ballot, you may contact me in care of:

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[Note – the recommended changes to the standard which include the current text of the relevant section(s) indicate deletions by use of ~~strikeout~~ and additions by grey highlighting. Rationale Statements are in *italics* and only used to add clarity; these statements will NOT be in the finished publication.]

NSF/ANSI Standard
for Wastewater Technology –

Disinfection Mechanics

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6 Chlorine disinfection devices

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6.5 Performance testing and evaluation

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6.5.2.2 Life test microbiological sampling

Extreme care shall be taken in designing a sampling program and sample site for chlorine disinfected water. The sample point shall be immediately adjacent to the outlet flow of the chlorine disinfection device contact chamber. Sterile sample bottles and sterile sample collection techniques shall be used during sample collection.

Microbiological organism samples shall be collected and analyzed three times per week over 30 d. Grab samples shall be collected at least 30 min after the start of the loading period for gravity chlorine disinfection devices. Samples shall be rotated in order of the loading periods per Section 6.5.2.1 so that one-third of the samples shall be collected in each of the loading periods (see Section 6.5.2.1) for gravity chlorine disinfection devices. Samples shall be collected during times of system discharge for pump dependent chlorine disinfection devices. When the pump is activated by floats, sample collection shall be rotated as close to the three different dosing periods as possible. When pumped discharge is based on a timer, samples are collected only during each discharge event, rotating between 5%, 50%, and 95% into the timed pump cycle. At the three tests per week ratio, each loading period shall have a minimum of five samples (the final week contains only two days, but three samples shall be collected during that week).

NOTE — The manufacturer may request additional samples per week complying with the above.

Sample containers shall contain disinfection neutralizer sufficient to halt the disinfecting action. Samples shall be refrigerated if not analyzed within 1 h of collection. Analysis shall be performed within 6 h of sample collection.

When samples are lost or invalidated, they shall be replaced with additional sampling during the following week, or additional weeks may be added to the life test until a minimum of 15 samples have been successfully analyzed.

6.5.2.3 Criteria

The geometric mean of microbiological organism concentration from all grab samples collected and analyzed under Section 6.5.2.2 shall meet the pass/fail criteria in Section 1.5.1.

6.5.3 Microbiological organism deactivation test

The microbiological organism deactivation test shall be conducted immediately following the life test using the same chlorine disinfection device that was tested and evaluated during the life test. Maintenance is allowed to be performed between the life test and the microbiological organism deactivation test, provided it is in accordance with methods and frequency specified in the service provider and owner's manuals. Chlorine disinfection devices shall be tested at the maximum and minimum flow rate settings based on specified flow capacities as required in Sections 6.5.3.1.1 and 6.5.3.1.2, as appropriate for the chlorine disinfection device being tested.

6.5.3.1.1 Hydraulic loading

One of the test sequences described in Section 6.5.3.1.1, 6.5.3.1.2, or 6.5.3.1.3 shall be completed on all chlorine disinfection devices, as determined to be worst-case by the certifying body.

6.5.3.1.1 Variable feed rate devices

The manufacturer shall specify the maximum wastewater flow capacity and flow rate, if required, for both the minimum and maximum chlorine feed rates. Flow shall be introduced continuously or in evenly spaced doses not exceeding 38 L (10 gal). The flow rate of influent to the disinfection device shall not exceed the manufacturer rated flow rate of the disinfection device during dosing. Variable feed rate chlorine disinfection devices shall be tested over 3 dosing periods described in the table below:

Hours 0 to 3	Device set to the chlorine feed rate used during the life test with wastewater flow set to the flow rate required to deliver 40% of the maximum flow capacity over the 3-h period (same as evening dosing during life test).
Purge 1	Purge contact chamber for a minimum of one chamber volume with wastewater flow set to the flow rate required to deliver 40% of the minimum flow capacity over a 3-h period. The device shall be set to deliver the minimum chlorine feed specified by the manufacturer for the minimum flow capacity during this purge.
Hours 3 to 6	Device set to deliver the minimum chlorine feed specified by the manufacturer for the minimum flow capacity with wastewater flow rate set to the same rate used in Purge 1.
Purge 2	Purge contact chamber for a minimum of one chamber volume with wastewater flow set to the flow rate required to deliver 40% of the maximum flow capacity over a 3-h period ~~for the maximum feed rate~~. The device shall be set to deliver the ~~minimum~~ maximum chlorine feed specified by the manufacturer for the maximum flow capacity during this purge.
Hours 6 to 9	Device set to deliver the maximum chlorine feed specified by the manufacturer for the maximum flow capacity ~~same chlorine feed and~~ wastewater flow rate set to the same rate used in Purge 2.