Agenda Item 620-1029

Title: **Correcting References to ASCE 7 for Wind**

Date: November 22, 2022

Revision: 0

Handled By: Eric Gnade
CB&I, A McDermott Company
14105 S. Route 59
Plainfield, IL 60544-8984
Telephone: 815-439-6476
Email: Eric.Gnade@McDermott.com

_____

Purpose: Correcting how different versions of ASCE 7 should be referenced for wind design requirements.

Source: Kyle Moelker (CB&I) pointing out an unintended error in the latest addendum that updated references from ASCE 7-10 to ASCE 7-16.

Impact: Prevent errors in generating wind loads for different versions of ASCE 7.

Rationale: API 620 5.4(k) directly references ASCE 7-16 when discussing the 0.78 multiplier applied to the code's 3-sec gust wind speed to convert from LRFD to ASD. Previous versions referred to ASCE 7-10, like API 650 5.2.1(k) still does. The issue with API 620 is that by ignoring that the ASCE wind speed changed to ultimate strength basis in ASCE 7-10, it could be misconstrued that the 0.78 multiplier isn't applicable to ASCE 7-10.

Proposed Changes

5.4.1 Individual Loads

k) **wind (W):** The design wind speed (V) shall be either; 1) the 3-sec gust design wind speed (mph) determined from ASCE 7-**05**, Figure 6-1, multiplied by $\sqrt{I}$; or 2) the 3-sec gust design wind speed determined from ASCE 7-10~~16~~, or a later version, for ~~risk~~ occupancy category specified by the purchaser ~~(typically risk category 2 applies—Figure 26.5-1b)~~ multiplied by 0.78; or 3) the 3-sec gust design wind speed specified by the purchaser. When wind is specified as measured by fastest mile, the speed shall be multiplied by 1.2. For tank components exposed to wind up to 80 ft above ground, the design wind pressures normal to the tank's outside surface shall be the pressures below, multiplied by (V/120)^2. For tank components located more than 80 ft above ground, use ASCE 7 to determine wind pressures.

Alternatively, pressures may be determined in accordance with ASCE 7 or a national standard for the specific conditions for the tank being designed.

Average wind pressure on the roof shall be used to design the roof to shell compression region and for overturning. Maximum wind pressure shall be used to design the roof and shell.

NOTE ASCE 7-10~~16~~, or a later version, wind velocities ~~now~~ have LRFD load factors and ~~risk~~ occupancy (importance factors) built in, whereas API 620 uses the working stress. The 0.78 factor applied to the ASCE 7-10~~16~~, or a later version, wind speed provides a conversion to working stress levels.