Agenda Item:	650-1044

Title:	**Sandwich panel-API650 Annex H2.2(f),**	
Date:	04/30/2016	
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Purpose:	Provide options for the metallic sandwich-panel type IFR panel modules.	
Source:	Sandwich panel-API650 Annex H2.2(f), Ref INQ-650-D75	
Revision:	4	
Impact:	Little to none and could provide alternatives should there be any. Could be significant to owners that currently have the hollow panel roofs in tank with rim fire protection only.	
Rationale:	As currently worded, API-650, Appendix H 2.2 f, can be misleading in both what it represents, style of roof, and the components of these. An inquiry was raised to this and an item was taken out to address this. This agenda is meant to address the confusion in which a hollow core panel aluminum type internal floating roof would reside. It will be addressed by including the hollow core panels in item d). All other hybrid designs will still fall into G.	
Proposal:	From API 650 12th Edition Addendum 3: H.2.1 The internal floating roof type shall be selected by the Purchaser after consideration of both proposed and future product service, operating conditions, maintenance requirements, regulatory compliance, service life expectancy, ambient temperature, maximum design temperature, product vapor pressure, corrosion conditions and other compatibility factors. Other operating conditions requiring consideration include (but are not limited to) anticipated pumping rates, roof landing cycles, and the potential for turbulence resulting from upsets, such as vapor slugs injected into the tank. Safety and risk factors associated with the roof types shall also be evaluated.18 The type of roof, which shall be designated by the Purchaser on the Data Sheet, Line 30, shall be one of the types described in H.2.2. H.2.2.d) Metallic double-deck internal floating roofs that have continuous closed top and bottom decks, which contain bulkheaded compartments for buoyancy. These roofs are in full contact with the liquid surface and are typically constructed of steel. H.2.2 f.) Metallic sandwich-panel/composite internal floating roofs have metallic or composite material panel modules for buoyancy compartments. Panel modules may include a honeycomb or closed cell foam core; however, cell walls within the panel module are not considered “compartments” for purposes of inspection and design buoyancy requirements (see H.4.1.7 and H.4.2.1)[22].These roofs are in full contact with the liquid surface and are typically constructed of aluminum alloys or Purchaser approved composite materials.[27] H.3.3 Aluminum Aluminum shall conform to the requirements of Annex AL. Aluminum skin shall be 0.50 mm (0.020 in.) minimum nominal thickness. Aluminum floats shall be 1.2 mm (0.050 in.) minimum nominal thickness. For a sandwich panel flotation unit, core material shall be at least 25 mm (1.0 in.) thick, and metallic skin (except carbon steel) shall be 0.41 mm (0.016 in.) minimum nominal thickness.	

To:

H.2.1 The internal floating roof type shall be selected by the Purchaser after consideration of both proposed and future product service, operating conditions, maintenance requirements, regulatory compliance, service life expectancy, ambient temperature, maximum design temperature, product vapor pressure, corrosion conditions and other compatibility factors. Other operating conditions requiring consideration include (but are not limited to) anticipated pumping rates, roof landing cycles, and the potential for turbulence resulting from upsets, such as vapor slugs injected into the tank. Safety and risk factors associated with the roof types shall also be evaluated.18 The type of roof, which shall be designated by the Purchaser on the Data Sheet, Line 30, shall be one of the types described in H.2.2. The floating roof descriptions in this document are roofs which are available to owner operators. As such, owner operators should refer to NFPA for what fire protection (rim or full engulfment) each roof will require. These descriptions by no means determine the sustainability of the floating roofs during a fire.

H.2.2.d) Metallic double-deck internal floating roofs that have continuous closed top and bottom decks, which contain bulkheaded compartments for buoyancy. These roofs are in full contact with the liquid surface and are typically constructed of steel, but could be constructed of an assembly of hollow core aluminum panels. NFPA 11 allows only steel for rim seal protection, but NFPA 30 allows closed buoyancy types for AST Spacing.[21] Design buoyancy shall be based on the loss of any two full panel modules (not cells within modules).

H.2.2 f.) Metallic sandwich-panel/composite internal floating roofs have metallic or composite material panel modules for buoyancy compartments. Panel modules may include a honeycomb or closed cell foam core; however, cell walls within the panel module are not considered “compartments” for purposes of inspection and design buoyancy requirements (see H.4.1.7 and H.4.2.1)[22].These roofs are in full contact with the liquid surface and are typically constructed of aluminum alloys or Purchaser approved composite materials.~~[27]~~ Delete footnote reference of 27. There is no 27 footnote. Design buoyancy shall be based on the loss of any two full panel modules (not cells within modules)

Footnote Change:

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A single inspection opening per panel module is permitted, regardless of core material; however, core materials producing enclosed spaces within a module may result in undetectable combustible gas in areas isolated from the inspection opening. ~~Design buoyancy shall be based on the loss of any two full panel modules (not cells within modules).~~

H.3.3 Aluminum In this section we have to reference roof styles

Aluminum shall conform to the requirements of Annex AL. Aluminum skin shall be 0.50 mm (0.020 in.) minimum nominal thickness. Aluminum floats or metallic skin for hollow core panel systems as defined by H2.2.d and shall be 1.2 mm (0.050 in.) minimum nominal thickness. For a sandwich panel flotation unit, core material or shall be at least 25 mm (1.0 in.) thick and metallic skin (except carbon steel) shall be 0.41mm (0.016 in.) minimum nominal thickness.