Inquiry: Under what conditions, is it permissible to use an alternative inspection procedure not requiring disassembly of a cylindrical window in a hyperbaric chamber, for the maintenance viewport inspection at the 10 yr window service life extension and viewport refurbishment requirements described in PVHO-2 paras. 2-4.3.1, 2-4.4, and Table 2-4.3-1?

Reply: It is the opinion of the Committee that disassembly of a cylindrical window in a hyperbaric chamber for a maintenance viewport inspection may be deferred when conducting the 10 yr window service life extension and viewport refurbishment requirements as described in PVHO-2 paras. 2-4.3.1, 2-4.4, and Table 2-4.3-1, provided the following conditions and requirements are met:

(a) The seal material show no visible evidence of creep or extrusion.

(b) The visible areas of the seal material show no evidence of deterioration due to aging (drying or cracking of exposed surfaces, etc.) detectable by visual examination. In designs that use seal rings (such as an O-rings) as the primary seal [see Fig. 1-1, illustration (b)], the seal ring must also be checked for brittleness and shrinkage, which will normally require removal of the seal ring. For designs using seal rings to be eligible for inclusion under this Case, the seal ring must be able to be removed, inspected, and, if needed, replaced with the window in place.

(c) The seats are either fabricated with corrosion-resistant materials or exhibit no visible breach of the coating system.

(d) There is no visible evidence of foreign matter or debris between the window and the seal or between the seat and the seal. Trace amounts of foreign matter or debris are acceptable.

(e) There is no visible evidence of chips on the edges of the window or any crazing adjacent to any of the portions of the window that are obscure from visual inspection.

(f) The seals exhibit no detectable leaks when examined with a standard leak-detection soap solution at maximum working pressure with the tie rods torqued to a value no greater than manufacturer’s specified maximum torque. Any soap solution used must be compatible with acrylic plastic.

(g) Review of available service history information indicates that there is no known history of the window having had significant exposures to environments that do not meet the definition of protected environments in PVHO-2. Brief periods of exposure to unfiltered sunlight, such as those encountered during transport, shall not be considered significant exposures.

If any of the above conditions are not met, the window shall be disassembled and a full refurbishment performed to meet the requirements of the maintenance viewport inspection.

For window geometries of the type shown in Fig. 1-1, illustration (a), this alternative inspection procedure provides an exemption from the disassembly requirement contained in the full 10 yr window service life extension and viewport refurbishment only until the next maintenance viewport inspection required per Tables 2-4.3-1 and 2-4.3-2. However, that exemption may be renewed at each subsequent maintenance viewport inspection so long as the above conditions continue to be met.

For window geometries of the type shown in Fig. 1-1, illustration (b), when the seal ring is replaced, this alternative inspection procedure provides an exemption from the disassembly requirements contained in the full 10 yr window service life extension and viewport refurbishment for an additional 10 yr. If the seal ring is not replaced, that exemption is valid only until the next maintenance viewport inspection required per Tables 2-4.3-1 and 2-4.3-2. However, in that case, it may be renewed at each subsequent maintenance viewport inspection so long as the above conditions continue to be met.

This Case number shall be shown on the Viewport Inspection form.
Fig. 1-1  Typical Seat, and Tie Rod Arrangement for Cylindrical Chamber Windows

(a) Combination Seal and Bearing Gasket Design

(b) Separate Seal Ring and Bearing Gasket Design