



U.S. Coast Guard Marine Safety Center News

The Marine Safety Center's Role in Control Verification Exams

The Marine Safety Center (MSC) supports the Coast Guard's marine safety and environmental protection mission by ensuring that the design of commercial vessels conforms to applicable national and international safety standards. This is accomplished through compliance reviews of vessel designs and oversight of third parties, such as maritime classification societies, who perform compliance reviews on behalf of the Coast Guard.

The MSC reviews approximately 16,000 marine designs annually to ensure they comply with the U.S. Code of Federal Regulations, the Safety of Life at Sea (SOLAS) treaty and other national and international laws, regulations and treaties.

The Coast Guard believes that an active Port State Control Program is an integral part of the SOLAS Convention, and passenger vessel safety is a specific area of emphasis for us. Those members of the cruise ship industry that serve the American

marketplace are familiar with the Coast Guard Control Verification Examination (CVE) Program, and our reviews of cruise ship designs for compliance with the fire safety and lifesaving standards in SOLAS. The MSC conducts the plan review of foreign passenger ships and augments the examination team conducting the initial CVEs for both new ships as well as existing ships that will be embarking passengers in U.S. ports for the first time.

The initial CVE process normally begins with a concept review meeting to discuss novel or interpretative issues before the vessel has reached the final design stage. Vessel plans are required to be submitted to the MSC six months in advance of the vessel's first U.S. port call, but through various cooperative agreements with leading classification societies, detailed plans are normally received much earlier. Such early submissions facilitate a smoother plan review process, as potential issues can be addressed before production. In 2000, the MSC reviewed plans on 51 different new and existing cruise ships.

As plan review is being completed, the Coast Guard will respond to requests for initial CVE, oftentimes at an overseas location. However, timing of these overseas examinations are heavily contingent upon the availability of Coast Guard resources. The actual initial CVE is normally comprised of four different inspection visits. The

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initial visits are best performed in a shipyard while the vessel is under construction or being modified, or during a maintenance period when the vessel is out of service. This is preferred because any potential problems can be identified and resolved before the vessel arrives in the U.S. to embark passengers.

- The first Coast Guard inspection normally takes place when a majority of the structural fire protection is completed and the bulkheads and overheads remain open. The 2-3 member Coast Guard exam team will inspect a representative sample of the ship's structural fire protection insulation and the ventilation system interface with fire barriers.
- The second Coast Guard inspection is an assessment visit by a single inspector to determine if the ship is complete enough to inspect the fire detection and extinguishing systems, machinery, means of escape arrangements, exit signage, and lifesaving equipment.
- The major portion of the initial CVE is carried out at the third inspection. At this time, a 3-5 person Coast Guard inspection team examines a representative sample of the fire detection and extinguishing systems, machinery, means of escape arrangements, exit signage, and lifesaving equipment, as well as verify that the final arrangements match our reviewed plans.
- The last part of an initial CVE usually takes place in the first port in the U.S. where passengers are embarked. At this time, the exam team will verify that any deficient items noted at earlier exams are now correct. Before any passengers are boarded, the Coast Guard exam team will also conduct a fire and abandon ship drill to test the crew's competency in an emergency. Lifeboats not previously lowered and released during the preceding inspection in the shipyard will be tested as part of the abandon ship drill.

In 2000, the MSC participated in 28 initial CVEs and interim inspections.

Interpretations to SOLAS

The International Maritime Organization (IMO) provides unified interpretations to the SOLAS regulations in documents such as MSC/Circ.847. The Coast Guard applies this and other circulars during plan review and examinations. Some recent interpretive issues, which are not addressed by IMO, but commonly encountered in plan review are discussed below.

"Weather Deck" Classification

Each space on a passenger vessel is assigned a fire hazard classification that indicates the correct fire integrity requirements to apply to the boundaries that enclose the area. As was discussed at the 45th session of the IMO Sub-Committee on Fire Protection (FP 45), the U.S. considers a Category (5) classification "*open spaces*" appropriate for a space that meets the definition of a Weather Deck in accordance with SOLAS Regulation II-2/3.17. This interpretation affects our review of mooring decks, pool areas, outdoor cafes, and other similar spaces onboard modern cruise ships. Specifically, spaces that are partially enclosed may not meet the definition of a weather deck and must be afforded with structural fire protection insulation, suppression, detection, material outfitting, and escape routes that are commensurate with the fire risk of the particular space. In our reviews, three key factors are evaluated to determine the fire risk of the space: the presence of high fire risk features such as machinery, cooking equipment, combustible or flammable storage areas under the overhanging deck; the degree of enclosure of the open deck area; and the proximity of any overhanging deck to vital areas and equipment onboard the vessel (i.e., escape routes, lifesaving appliances, emergency equipment, ventilation inlets and exhausts). In general, partially enclosed areas that are covered for less than 10 meters are still considered type 5

areas, provided that all of the high risk areas beneath the overhang are adequately separated from the surrounding areas. We request that owners and shipyards present the details of such areas to our office during the concept review of the vessel's arrangements.

Theater Smoke Extraction Systems

Traditionally, multi-deck theaters have not been required to be fitted with a smoke extraction system under the provisions of SOLAS Regulation II-2/32.1.7. However, we are increasingly concerned about the means of escape from some of the larger multi-deck theater designs. Specifically, theater designs that incorporate steep balcony arrangements, restricted corridor width, or contain multiple enclosed spaces may not provide sufficiently rapid means of escape for all personnel located within the space. While we prefer that the egress arrangements be modified to provide ample time for the occupants to become aware of and escape from potentially hazardous situations, we will consider the use of a smoke extraction system as an equivalent arrangement. We request that owners and shipyards present the details of the theater arrangements to our office during the concept review of the vessel's arrangements.

Multi-Deck Space Bulkheads

When a public space spans two or more decks the upper bulkheads of the public space have typically been required to meet the deck integrity structural fire protection requirements of SOLAS Regulation II-2/26.2 instead of the bulkhead integrity requirements. This arrangement is analogous to the treatment of Category 2 spaces "stairways", Category 10 trunks "tanks, voids and auxiliary machinery spaces having little or no fire risk", and two-deck stairways (SOLAS II-2/29.1.1), all of which require A-class integrity for openings that span multiple decks. During our review, we will ensure that these spaces are protected by bulkheads meeting the deck criteria above the lowest level.

Direct Access to Stairways

Changes to the SOLAS regulations over the past two decades have greatly reduced the number and type of spaces that are permitted to open directly into stairways. The intent of these changes has been to limit access to the stairway from spaces where a fire is likely to originate. By allowing public spaces to retain direct access to the stairway, the regulations have balanced the risk of fire with the need for rapid egress of passengers and crew from the public space. Recently we have observed a number of technical areas (i.e., theater offices, catwalks, backstage storage, orchestra pits, atrium lift machinery), located within the boundaries of a public space, that provide direct access to a stairway via normally closed service doors. The Coast Guard will continue to discourage direct access from these technical areas to stairways on future new buildings.

Categorization of Spaces

SOLAS Regulation II-2/26.2.2 attempts to clearly define fire hazard categories of different space types. During our plan review, we have encountered a number of varying interpretations on space categorization. Some of those we are most concerned about are listed below.

Luggage Handling Space

The luggage handling space generally has direct access to a stairtower, is used as part of an escape route, is used to store machinery and equipment for moving supplies in the reefer area, and might be used for luggage storage if no other baggage storeroom exists. Some Administrations assign a luggage handling space the dual categorization of (3) "corridors"/ (13) "storerooms". These spaces are accepted by the Coast Guard as an escape route with direct access to a stair provided that the luggage handling spaces are not used for storage. If the luggage handling space is used for storage of supplies, equipment or baggage, the Coast Guard considers the space as

category (13) only, and it may not be used as an escape route nor will the space be permitted to maintain direct access to a stairway. While we address this issue during our concept review of the vessel's arrangements, the inspectors attending the vessel will verify the stowage arrangements in the area.

Walk-In Reefers

The Coast Guard currently considers walk-in reefers as category 11 spaces *"auxiliary machinery spaces of moderate fire risk"*. We previously accepted smaller walk-in reefers as equipment within a categorized space, and factory-built models were permitted without additional structural fire protection. The IMO Sub-Committee on Fire Protection determined that this policy is an amendment to the SOLAS regulations. Thus, it is no longer appropriate for us to continue to allow uncategorized walk-in reefers. However, we will still consider the use of other arrangements, such as the use of Flag approved A-class joiner panels that provide an equivalent level of safety to structural divisions.

Pool Equipment Rooms

Many of the pool treatment chemicals observed on recent new buildings are strong oxidizers. While these chemicals are not flammable, they can exacerbate fire growth by generating additional oxygen when exposed to a fire. Additionally, these chemicals may also produce toxic fumes or corrosive by-products when heated or released in bulk form. The increased hazards that these chemicals pose, requires a greater level of fire protection than a category (10) space *"tanks, voids, and auxiliary machinery spaces having little or no fire risk"* provides. Accordingly, the Coast Guard considers that spaces where these chemicals are used or stowed should be assigned as category (13) spaces *"store-rooms, workshops, pantries"*. These spaces should also be protected with automatic fire suppression and detection as appropriate.

Massage Rooms

Massage rooms located within sauna or gymnasium areas have typically been assigned as category (9) spaces *"sanitary and similar spaces"*. However, inspection of the vessel occasionally reveals these spaces to be outfitted more like a cabin than a sanitary space. Accordingly, the Coast Guard considers that where massage rooms are outfitted with combustible materials and/or contain storage for linens and supplies, the massage room should be categorized as a (6) space *"accommodation spaces of minor fire risk"* or (7) space *"accommodation space of moderate fire risk"* and fitted with appropriate structural fire protection, and automatic fire suppression and detection.

Marine Safety Center Online

The MSC website, www.uscg.mil/hq/msc, is a repository for a wealth of information pertaining to commercial vessel safety. Numerous links are provided to key information such as Navigation and Vessel Inspection Circulars (NVICs 1-93 and 4-95 being the most well known to the cruise industry). Also available at this web site are the previous Seatrade Newsletters and the MSC plan review guidelines for CVE plan review. In particular, H2-21 gives the submitter guidance and assistance in preparation of drawings and information that the MSC reviews to verify compliance with the necessary standards. This work instruction was developed as an aid in the preparation and review of vessel plans and submissions. H2-21 is not intended to substitute or replace laws, regulations, or other official Coast Guard policy documents.

The Marine Safety Center is available to answer questions at any time during the design and construction process. Concept review of novel arrangements and designs is encouraged. Please contact the Chief of the Major Vessel Branch (LCDR Charlie Rawson) at (202)366-6481 or fax your inquiry to (202)366-3877. We look forward to working with you.