

Exemption No. 11994

UNITED STATES OF AMERICA
DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
WASHINGTON, DC 20591

In the matter of the petition of

PMI GLOBAL SERVICES, INC

for an exemption from § 91.211(b)(1)(ii)
of Title 14, Code of
Federal Regulations

Regulatory Docket No. FAA-2014- 0331

DENIAL OF EXEMPTION

By letter dated May 21, 2014, Mr. John Dillman, Chief Pilot, PMI Global Services, Inc. (PMI), 180 Airport Road, Hangar D-2, Westchester County, Airport White Plains, NY 10604 petitioned the Federal Aviation Administration (FAA) on behalf of PMI for an exemption from § 91.211(b)(1)(ii) of Title 14, Code of Federal Regulations (14 CFR). The proposed exemption, if granted, would relieve PMI from the requirement that one pilot crewmember wear and use an oxygen mask while at flight altitudes above flight level 410. Relief is sought for domestic and international 14 CFR part 91 operations for company aircraft equipped with quick donning oxygen masks and Automatic Emergency Descent Mode technology.

The petitioner requires relief from the following regulation:

Section 91.211(b)(1)(ii) prescribes, in pertinent part, that no person may operate a civil aircraft of U.S. registry with a pressurized cabin at flight altitudes above flight level 350 unless one pilot at the controls of the airplane is wearing and using an oxygen mask that is secured and sealed and that either supplies oxygen at all times or automatically supplies oxygen whenever the cabin pressure altitude of the airplane exceeds 14,000 feet (MSL), except that the one pilot need not wear and use an oxygen mask while at or below flight level 410 if there are two pilots at the controls and each pilot has a quick-donning type of oxygen mask that can be placed on the face with one hand from the ready position within 5 seconds, supplying oxygen and properly secured and sealed.

The petitioner supports its request with the following information:

The petitioner states that it is a corporate flight department operating the majority of its scheduled trips with two Gulfstream 550 airplanes on long flights to international destinations throughout the world. The petitioner explains that it employs ten fulltime, fully trained, pilots as crew members on company aircraft. PMI states that each company pilot is sent to Flight Safety International every 6-8 months for recurrent ground school and simulator training, to include demonstrating manual emergency descents.

PMI states the Gulfstream 550 airplane is capable of cruising up to an altitude of flight level 510. PMI claims that the FAA type certification of the airframe and systems results in a very “highly improbable” decompression failure rate up to and including its service ceiling. PMI names four ‘mitigators’ that the airplane is equipped with to reduce the likelihood and risk of decompression. PMI lists the ‘mitigators’ as follows:

1. **Automatic Emergency Descent Mode (EDM)** – EDM is armed any time the airplane altitude is greater than 40,000 feet with the autopilot selected ON. When the “Cabin Pressure Low” warning message illuminates on the Crew Alerting System (CAS) (usually 8,000 feet cabin pressure), with the airplane above 40,000 feet and autopilot ON, the following occurs:
 - 1) Speed target changes to 340 KCAS in manual mode.
 - 2) The altitude is preselected to 15,000 feet.
 - 3) The autopilot commands a left turn with a 90 degree heading change.
 - 4) The auto throttle retards power to idle. (If auto throttles are not engaged, they will automatically be engaged).
 - 5) The airplane descends at Mmo / Vmo to 15,000 feet.
 - 6) At 15,000 feet, the speed target changes to 250 KCAS.

According to PMI, with EDM installed, the pilots are not preoccupied by having to perform this “automatic” emergency descent so their immediate attention can be focused on donning the oxygen mask.

2. **Quick-don Oxygen Masks.** PMI asserts that each crewmember is trained and evaluated at Flight Safety International every 6-8 months to don their mask within 5 seconds.
3. **Aft Bulkhead Door.** The airplane is equipped with an Aft Bulkhead Door which PMI claims creates a dual hull, protecting the cabin from the two most likely causes of decompression (a catastrophic engine failure resulting in a puncture of the aft baggage area, or the external baggage door/seal failure).
4. **Cabin Pressure Low warning system.** A red message light will illuminate and three chimes sound when the cabin pressure exceeds a predetermined value (usually 8,000 feet cabin altitude).

PMI asserts that the Gulfstream 550 pressurization system components are highly redundant, making a failure of the system very unlikely. As examples of redundancy, PMI explains various functionality built into the Thrust Recovery Outflow Valve (TROV) and Cabin Pressure Controller (CPC).

PMI makes additional safety arguments related to oxygen systems and human factors to demonstrate no degradation of safety if the exemption were granted. PMI claims that oxygen masks and associated systems were designed primarily to be used in the event of an emergency – not for prolonged use.

PMI also asserts that operations at flight level (FL) 450 without one pilot on oxygen is not accepting a higher level of risk than operations at flight level 410 because EDM and the Cabin Pressure Low warning system make the pilot's reaction time quicker and pilot actions fewer than in other aircraft. As an example, PMI states that the time of useful consciousness (TUC) is documented by the Civil Aerospace Medical Institute to be 9 to 12 seconds at altitudes from flight level FL410 up to FL450. PMI states that a PMI pilot need only don the oxygen mask within the TUC while the aircraft begins the emergency descent. PMI claims to train for this scenario. Even if both pilots, along with the flight technician, were to experience a brief loss of useful consciousness, PMI states that the Gulfstream 550 will still initiate an emergency descent to a safe altitude.

PMI believes it is unique within the aviation community for two reasons:

1) **Flight Technician.** PMI states that on every passenger carrying flight, that there are four crewmembers (2 pilots, 1 flight technician, and 1 flight attendant). According to PMI, the presence of the flight technician is an added safety factor because the technician occupies the jump seat on every flight. The jump seat (located behind and directly between the pilot seats) is equipped with its own quick donning oxygen mask that can be donned and supplying oxygen within 5 seconds. PMI claims that in the event that a pressurization emergency was to occur, the flight technician is fully trained and capable of not only donning his own oxygen mask, but he can assist either pilot in donning their mask if required. The third flight deck crewmember, in PMI's view, is an added safety benefit on every flight by offering a third pair of eyes, situational awareness, and maintenance technician skills to assist in decision making.

2) **Flight Planning.** PMI states that it does not flight plan their Gulfstream 550 airplanes above FL410. The petitioner asserts that it only flies above FL410 when conditions dictate (e.g. weather, turbulence, and fuel range considerations) and, once clear of these conditions, its airplanes will descend to FL410 or below. The petitioner states that it has identified negative effects on the pilot's ability to perform due to long-term wear and use of oxygen masks. According to PMI, difficulties such as communication, fatigue, eating, drinking water, inability to properly scan and difficulty reaching certain cockpit items when wearing oxygen masks for long periods have been identified in the petitioner's Safety Management System (SMS).

PMI claims that the public interest would be served by increased fuel efficiency, increased fuel economy, decreased fuel consumption, and decreased harmful atmospheric gases, all as a result of higher altitude flight. PMI also believes that airspace will be less congested because operators will be encouraged to fly at higher altitudes.

The FAA has determined that good cause exists for waiving the requirement for Federal Register publication because the exemption, if granted, would not set a precedent, and any delay in acting on this petition would be detrimental to PMI.

The FAA's analysis is as follows:

The FAA has reviewed the information presented by PMI Global Inc. in support of its petition for exemption and has determined that a grant of exemption would not provide an equal level of safety or be in the public interest. The type of operations proposed by PMI have previously been proposed and evaluated by the FAA. However, because of the specific features of the Gulfstream 550 and unique information provided by the petitioner, the FAA will provide a full analysis of the petition.

In Denial of Exemption No. 4667 (copy enclosed), the FAA stated that in Notice No. 82-11, Pilot Oxygen Mask Requirements; Notice of Proposed Rulemaking (NPRM) (47 FR 35146, August 12, 1982) it proposed amendments that would allow the operation of aircraft at higher altitudes than presently specified in the regulations without requiring at least one pilot at the controls to wear and use an oxygen mask. Because of concerns expressed by commenters opposed to the proposed amendments, the FAA reconsidered the NPRM and the supporting rationale included therein and in previous grants of exemption. The FAA determined that it should not issue further grants of exemption and withdrew Notice No. 82-11 (51 FR 9432, March 18, 1986). The FAA further determined that if it found that it could grant relief from the current regulation, it would initiate a rulemaking action rather than issue grants of exemption. The FAA maintains this policy position.

PMI explains the safety and engineering features of the Gulfstream 550. However, in Denial of Exemption No. 6817 (copy enclosed), the FAA found that despite the safety and engineering features and structural integrity built into technologically advanced aircraft for operations at high altitudes, the possibility still exists that these aircraft could lose cabin pressurization. The FAA stated that consideration must be given to the physiological consequences of the flight crewmembers in the event of a rapid decompression. Therefore, notwithstanding PMI's assertion that the pressurization system components are redundant and that the FAA type certification of the airframe and systems make a failure of the system very unlikely, the FAA considers that a reduction in the likelihood that such an incident might occur does not maintain a level of safety equivalent to the rule from which the exemption is sought. Additionally, the FAA does not concur with the petitioner's claim that the airplane's four 'mitigators' (EDM, oxygen masks, aft bulkhead door, and cabin pressure low warning system) reduce the likelihood and risk of decompression. Only one 'mitigator' (aft bulkhead

door) is designed to reduce the likelihood and risk of decompression. The other 'mitigator's' are designed to assist the crew in managing the pressurization emergency.

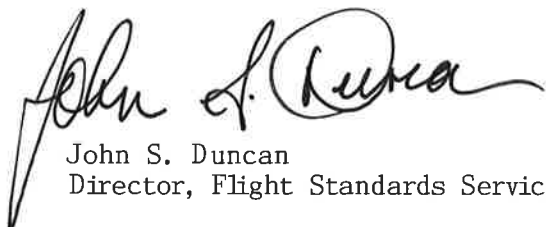
The FAA does not agree with PMI's assertion that the presence of a Flight Technician aboard the airplane on every passenger carrying flight is an added safety factor. It cannot be presumed that additional crewmembers equipped with their own quick donning oxygen mask, even if they are fully trained and capable of donning it, will be immune from the effects of rapid loss of pressurization and therefore able to assist either pilot in donning their oxygen mask. In cases of high altitude depressurization, a third pair of eyes, situational awareness, and maintenance technician skills to assist in decision making do not provide an equivalent level of safety or no degradation in safety to the rule from which the exemption is sought.

The FAA does not agree that flight planning PMI Gulfstream 550 airplanes below FL410 provides adequate justification for an exemption. The petitioner asserts that it only flies above FL410 when conditions dictate (e.g. weather, turbulence, and fuel range considerations) and once clear of these conditions its airplanes will descend to FL410 or below. Although PMI would benefit from increased fuel efficiency, increased fuel economy, and decreased fuel consumption because of higher altitude flight, this does not support the public interest. In Denial of Exemption No. 6817, the FAA stated that should it determine that it is appropriate to allow the relief requested, the FAA would take appropriate action to amend the rules rather than issue an exemption. The rulemaking process provides the FAA an opportunity to obtain comments from a much larger segment of the aviation industry, the public, other government agencies, thereby presenting issues to a much broader audience.

The FAA's Decision:

In consideration of the foregoing, I find that a grant of exemption would not be in the public interest. Therefore, pursuant to the authority contained in 49 U.S.C. §§ 106(f), 40113 and 44701, delegated to me by the Administrator, the petition of PMI Global Services Inc. for an exemption from 14 CFR § 91.211(b)(1)(ii) to the extent necessary to relieve PMI from the requirement that one pilot crewmember wear and use an oxygen mask while at flight altitudes above flight level 410, for domestic and international 14 CFR part 91 operations for company aircraft equipped with quick donning oxygen masks and Automatic Emergency Descent Mode technology, is hereby denied.

Issued in Washington, D.C., on June 26, 2015



John S. Duncan
Director, Flight Standards Service