



U.S. Department  
of Transportation

**Pipeline and Hazardous  
Materials Safety  
Administration**

1200 New Jersey Avenue, SE  
Washington, DC 20590

August 6, 2020

Robert Ragar  
V.P. Contractual Business & Hazardous Materials  
Tatonduk Outfitters Limited, dba Everts Air Cargo  
5525 Airport Industrial Road  
Fairbanks, AK 99709

Reference No. 20-0041

Dear Mr. Ragar:

This letter is in response to your May 11, 2020, email and subsequent telephone conversations requesting clarification of the Hazardous Materials Regulations (HMR; 49 CFR Parts 171-180) applicable to the operation of research and testing equipment installed on an aircraft.

Specifically, you detail the following scenario and ask whether the operations are subject to the requirements of the HMR:

- ZeroGravity Corporation operates parabolic flights that create micro gravity environments;
- During some of these flights, ZeroGravity Corporation supports governmental and private needs for research and testing in a micro gravity environment;
- On these flights, research and testing platforms are installed on the aircraft. Some of these platforms may contain various amounts of hazardous materials;
- Prior to flight, these research and testing platforms comply with Engineering Orders, receive approval from the Federal Aviation Administration (FAA) Designated Engineering Representative, comply with FAA Engineering Data Approval Form 8110-3, and are inspected by Required Inspection Item prior to flight; and
- After receiving satisfactory determinations, these research and testing platforms are deemed worthy for air transportation.

The answer is yes. Unless otherwise excepted, when the research and testing equipment contain a hazardous material, the operations are subject to the HMR. The HMR does provide certain exceptions, including those for air transportation in part 175. For example, § 175.8 provides exceptions for operator equipment that is required aboard an aircraft in accordance with applicable airworthiness requirements and operating requirements. However, because the research and testing equipment is not required onboard the aircraft for the operational flight and airworthiness of the aircraft, it is not eligible for this exception. Additionally, § 175.9 provides exceptions for certain special aircraft operations when applicable FAA operator requirements have been met. Again however, based on the scenario provided in your request, it does not

appear that the operations meet any of these special aircraft operations.

If a person cannot comply with the requirements of the HMR or wishes to perform a function that is not otherwise permitted under the HMR, a special permit would be required to perform the functions, in accordance with 49 CFR part 107, subpart B.

Please note that the HMR only applies to the transportation of hazardous materials. Therefore, the research and testing platforms must also comply with any additional air worthiness requirements, in accordance with 14 CFR.

I hope this information is helpful. Please contact us if we can be of further assistance.

Sincerely,

A handwritten signature in blue ink, appearing to read "Dirk Der Kinderen".

Dirk Der Kinderen  
Chief, Standards Development Branch  
Standards and Rulemaking Division

**From:** [INFOCNTR \(PHMSA\)](#)  
**To:** [Hazmat Interps](#)  
**Subject:** FW: Request for clarification and interpretation Zero-G  
**Date:** Thursday, May 14, 2020 3:35:21 PM  
**Attachments:** [Letter for Interpretation 5-11-2020.doc](#)  
[20 5 Regar.docx](#)

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Hello Alice and Ikeya,

Please see the attached letter of interpretation request.  
Please contact our office with any questions.

Thanks,  
Kathryn (HMIC)

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**From:** Robert Ragar <[RRagar@evertsair.com](mailto:RRagar@evertsair.com)>  
**Sent:** Tuesday, May 12, 2020 3:10 PM  
**To:** INFOCNTR (PHMSA) <[INFOCNTR.INFOCNTR@dot.gov](mailto:INFOCNTR.INFOCNTR@dot.gov)>  
**Cc:** Robert Ragar <[RRagar@evertsair.com](mailto:RRagar@evertsair.com)>  
**Subject:** Request for clarification and interpretation Zero-G

Dear PHMSA,

Following a conversation with Sarah, I am attaching a letter requesting guidance and interpretation on the applicability of certain 49CFR parts with certain aspects of installed systems on an aircraft.

Please contact me if you have any questions or need further clarification, and to let me know your interpretation.

Sincerely,

Robert Ragar  
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Mr. Shane Kelley  
Director, Standards and Rulemaking Division  
U.S. DOT / PHMSA (PHH-10)  
1200 New Jersey Avenue, SE East Building, 2<sup>nd</sup> Floor  
Washington, DC 20590

Re: Request for clarification and guidance / interpretation

Dear Mr. Kelley,

11 May 2020

Tatonduk Outfitters Limited dba Everts Air Cargo, operates a specially equipped jet aircraft that conducts parabolic flights to create micro gravity environments. The clarification needed from PHMSA is whether or not the current engineering, review, and airworthiness authorization process appropriately covers this type of program, or whether a Special Permit is additionally required (above and beyond the airworthiness engineering process)?

Historically, these flights were conducted by NASA for astronaut training, and scientific research and testing in reduced or zero gravity environments (micro gravity). These flights are now conducted commercially through an organization called ZeroGravity Corporation, which developed a program specifically for this need. The commercial program now supports both governmental and private needs for research and testing in micro gravity environments.

During the testing and research process, many scientific lab equipment structures are designed and built to support (and achieve), the research/testing goals. These research/testing platforms requiring the micro gravity environment are designed by the science labs in collaboration with the airline to ensure that they meet or exceed aviation airworthiness standards.

All of the research and testing platforms for installed equipment onboard an aircraft must be in compliance with Engineering Orders, receive approval from the FAA Designated Engineering Representative (DER), comply with FAA Engineering Data Approval Form 8110-3, and be inspected by Required Inspection Item (RII) prior to flight. Following all satisfactory determinations throughout this process, the equipment become part of the airworthiness of the aircraft.

Some of the research & testing platforms may contain various amounts of regulated materials (dangerous goods when transported in commerce). However, these materials are designed and incorporated into the research/testing platforms as part of those structures, and go through the complete Engineering Approval process prior to being installed on the aircraft (as part of the aircraft). Prior to aircraft installation, when these regulated items are transported in commercial transportation, they are packaged, marked, labeled, declared according to their basic description at that time (for any mode of transportation when applicable), and in full compliance with 49 CFR.

All subject matter experts involved with the research / testing phase of a flight undergo background checks, training, and testing, prior to accompanying a flight. Company Coaches/Flight Attendants accompany persons during all flights to ensure a high level of safety and security during the flight. All of the Coaches/Flight Attendants are trained on the sequence and methods used for the research and testing, and supervise the individuals involved to ensure that conduct and activities do not deviate from the safety parameters for those tasks. Pilots are involved with the engineering & planning development, mission preparation, safety, security and quality control briefings before any flight, so they are knowledgeable of all aspects of the mission, and what is on their aircraft throughout the whole process.

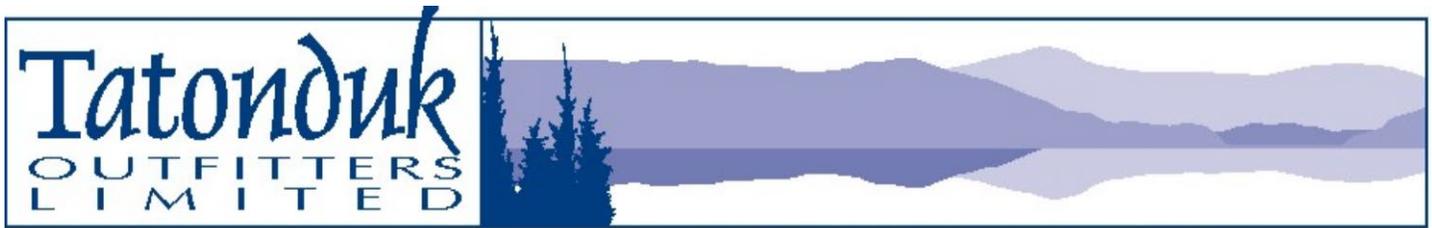
Recently, an FAA official familiar with 49 CFR Transportation of Dangerous Goods, questioned Everts Air Cargo on how the packaging, marking, labeling and other requirements in 49 CFR, were being complied with (for those items that are listed in the 172.101 table), and installed in these research / testing platforms. The Company explained that the compliance was through the engineering and authorization process i.e. the various dangerous goods were designed into the research & testing platforms. However, it was suggested that perhaps a Special Permit for the Airline, as well as, the Astronauts and Scientists, may be required.

This program has several manuals that outline the processes and conduct of the operations, which have all been accepted and approved by FAA subject matter experts. Clarification or interpretation is needed from PHMSA as to whether or not a Special Permit is additionally required.

Your response to the above request is appreciated. If you have any questions, please don't hesitate to contact me.

Regards,

Robert Ragar  
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