

INFORMATION COLLECTION SUPPORTING STATEMENT

TITLE

Human Space Flight Requirements for Crew and Space Flight Participants
OMB Control Number 2120-0720

- 1. Explain the circumstances that make the collection of information necessary. Identify any legal or administrative requirements that necessitate the collection. Attach a copy of the appropriate section of each statute and regulation mandating or authorizing the collection of information. (Annotate the CFR parts/sections affected).**

The FAA has established requirements for human space flight of crew and space flight participants as required by the Commercial Space Launch Amendments Act of 2004. The rulemaking established requirements for crew qualifications, training and notification, and training and informed consent requirements for space flight participants. The rulemaking also modified existing financial responsibility requirements to account for space flight participants, crew, and the FAA's new authority to issue an experimental permit. The FAA conducted the rulemaking in order to fulfill its responsibilities under the act. The requirements were designed to achieve public safety and to notify individuals on board of the risks they face from launch or reentry. The section of each statute and regulation mandating or authorizing the collection of information is presented below. In general, the information is provided by the operator proposing to conduct a launch with flight crew or a space flight part on board. However, in a few instances, a space flight participant or flight crew member is also involved in providing information such as when executing of a reciprocal waiver of claims with the DOT/FAA in accordance with § § 460.19 and 460.49.

The FAA receives the information from the respondents through several ways. The applicant (operator proposing to conduct a launch) provides some of the information [§ § 460.5, 460.7, 460.11, 460.13, 460.13, 460.15, 460.17, 460.51, and 460.53] to the FAA/AST (Office of Commercial Space Transportation) when it is applying for a launch license. Other information is received by the FAA/AST after an applicant becomes a licensee after receiving a launch license and conducts launch operations. When a licensee conducts launch operations, the FAA/AST performs safety inspections and requests, receives, and reviews certain documents from the licensee to ensure that the licensee is complying with the terms and conditions of its license.

Furthermore, the FAA/AST gets copies of the reciprocal waiver of claims because the FAA executes them with the licensee, space flight participants, and flight crew members.

Flight crew members and space flight participants in general are not federal employees; however, this doesn't rule out the possibility that a federal employee such as a NASA astronaut might be on board a commercial launch vehicle and would be considered to be a space flight participant.

§ 460.5 Crew qualifications and training and § 460.7 Operator training of crew

The CSLAA requires that each crew member receive training and satisfy medical or other standards as specified in a license or permit. 49 U.S.C. § 70105(b)(4)(A). Furthermore, the CSLAA requires crew to comply with all requirements of the laws of the United States that apply to crew. 49 U.S.C. § 70105(b)(4)(C).

The FAA requires a training program to be continually updated to ensure that training accounted for lessons-learned from both training and operational missions. This is accomplished with a documented system to track revisions and updates. The FAA requires a training program to capture, in writing, lessons-learned as experience is gained. The FAA requires a licensee or permittee to document the training completed by each member of the flight crew and any remote operator and maintain the documentation for each active member of the flight crew and remote operator. The FAA requires an operator to ensure that all flight crew and remote operator qualifications are current before starting to operate a vehicle with humans on board.

The FAA found that operator maintenance of a current training and qualification program that incorporates lessons learned to facilitate continuous improvement, and retention of associated documentation and crew certification records is customary and usual practice within the commercial space transportation industry. Although evidence of previous practice was limited to the recent space flights of Scaled Composites' SpaceShipOne, which did not include passengers, the FAA found that: (1) previous training practices of commercial operators for space flight crew were consistent with the rule (as evidenced by SpaceShipOne).

§ 460.9 Informing flight crew of launch risk.

The CSLAA requires that an operator (holder of a license or permit) inform any individual serving as crew in writing, prior to executing any contract or other arrangement to employ that individual (or, in the case of an individual already employed as of the date of enactment of the CSLAA, as early as possible, but in any event prior to any launch in which the individual will participate as crew), that the United States Government has not certified the launch vehicle as safe for carrying flight crew or space flight participants. 49 U.S.C. § 70105(b)(4)(B). While this formality may be exercised voluntarily by an operator, it may not be customary and usual industry practice in all instances. The FAA estimates that a commercial entity expends as many as four person-hours to prepare the initial documentation conveying the required information for flight crew only (a one-time cost); one person-hour is incurred for each space flight mission to update and administer the document and maintain it as a record.

§ 460.19 Crew waiver of claims against U.S. Government.

The CSLAA requires that crew execute a reciprocal waiver of claims with the DOT/FAA. 49 U.S.C. § 70112(b)(2). Crew includes flight crew and any remote operator. The FAA estimates that a commercial entity expends as many as four person-hours to prepare the initial documentation required for crew (one-time cost); one person-hour is incurred for each space flight mission to administer the document and maintain it as a record.

§ 460.45 Operator informing space flight participant of launch risks.

The CSLAA requires that a licensed or permitted operator inform a space flight participant in writing about the risks of the launch and reentry, including the safety record of the launch or reentry vehicle type. 49 U.S.C. § 70105(b)(5)(A). Specifically, the rule, § 460.45, requires an operator to: (1) inform each space flight participant in writing of the safety hazards and associated risks of the mission and other safety-related information (e.g., government and commercial space flight safety records), and (2) obtain affirmation of receipt and understanding of this safety information by way of signature from each space flight participant. The FAA found that developing much of the safety-related information has been industry practice (e.g., deriving risk probabilities from a fault tree or hazard analysis); however, certain aspects of this requirement were not, such as compiling industry-wide and government safety record information. Further, the FAA maintains that preparing a document to convey the requisite information in a manner that will be readily understood by a space flight participant who is not likely to have any formal space technology education or training (e.g., aerospace engineering) was not likely to be customary or usual practice. Therefore, the FAA estimated that a commercial entity expends as many as 120 person-hours to prepare the initial launch risk and consent form documents (a one-time cost); two person-hours are expended prior to each space flight mission updating and documenting the safety record information and maintaining a record of the signed consent form. An individual space flight participant needs only to read the consent form and sign it, thereby indicating their understanding and acceptance of the risks of space flight.

In the final rule the FAA added the requirement that each operator must provide each space flight participant an opportunity to ask questions orally to better understand the risks of the mission. With or without this requirement, space flight participants are likely to ask questions to understand mission

risks and the operator will respond so they won't lose a client. Therefore, the FAA does not attribute any costs to this requirement.

§ 460.49 Space flight participant waiver of claims against U.S. Government

The CSLAA requires that each space flight participant execute a reciprocal waiver of claims with the DOT/FAA. 49 U.S.C. § 70112(b)(2). This was a new requirement, as space flight participants were not addressed under the previous rule. The FAA maintains that an operator likely expends the effort required to prepare and record the documentation on behalf of a space flight participant. The FAA estimates that a commercial entity expends as many as four person-hours to prepare the initial documentation required for a space flight participant (a one-time cost); one person-hour is incurred for each space flight mission to administer the document and maintain it as a record, regardless of the number of space flight participants (i.e., passengers). A commercial operator ultimately passes these costs on to a space flight participant, as reflected in the price charged for the space flight. Accordingly, these costs are included in the direct compliance costs to a commercial operator for simplicity and conservatism.

§ 460.11, § 460.13, § 460.15, § 460.51, and § 460.53 (Other requirements related to public safety)

Under the FAA's public safety mandate, the FAA established requirements for the following areas: environmental control and life support system, smoke detection and fire suppression, human factors, space flight participant training, and security requirements. The FAA founds that the requirements were consistent with previous practice and presented no new requirements that would impose costs.

Consistent with the FAA's safety goals, the principal benefit of the rule is to ensure that the human commercial space transportation industry understands and adheres to the previous practices that had worked to protect public safety and the environment. In so doing, the FAA maintains that the rule helps preserve the level of safety already achieved by commercial operations, recognizing that human commercial space flight experience is limited. Additionally, informing space flight participants of mission hazards and risks may help mitigate any behavior or reaction during space flight that would jeopardize mission success and consequently public safety. For example, a surprise noise or abrupt vehicle motion during flight could frighten an "uninformed" passenger, causing a space flight participant to behave or act (e.g., panic) in a manner that could adversely impact mission performance and jeopardize public safety resulting from a ground impact crash or a falling debris from an airborne explosion. Further, informing candidate space flight participants (i.e., passengers) of risks may deter an individual from participating in space flight whom otherwise would panic during flight and possibly create a situation that would jeopardize public safety.

2. ***Indicate how, by whom, and for what purpose the information is to be used. Except for a new collection, indicate the actual use the agency has made of the information received from the current collection.***

The information, described under section #1, is used by the FAA, a licensee or permittee, a space flight participant, or a crew member. The FAA uses the information related to public safety to ensure that a launch or reentry operation involving a human on board a vehicle will meet the risk criteria and requirements with regard to ensuring public safety. For example, the FAA assesses crew qualifications and training, especially those of a pilot, to ensure that the pilot has the proper experience and skills to operate a launch or reentry vehicle without affecting public safety. A space flight participant and crew member uses information provided by the operator to help make a decision on whether they voluntarily assume the risk. An operator must inform each crew member and space flight participant in writing that the U.S. Government has not certified the launch vehicle as safe for carrying flight crew or space flight participants. In addition, an operator must inform any space flight participant of the risks associated with launch and reentry activities. In turn, a space flight participant must provide written, informed consent as a way of showing that he or she understands and voluntarily accepts the risks associated with participating in space launch activities. An operator is the recipient of a written, informed consent from a space flight participant and is responsible for ensuring that one was received before allowing a space flight participant to be on board a launch or reentry vehicle.

The CSLAA requires that flight crew and space flight participants execute a reciprocal waiver of claims with the DOT/FAA. Prior to a mission, the FAA ensures that crew and space flight participants have executed a reciprocal waiver of claims with the DOT/FAA.

3. ***Describe whether, and to what extent, the collection of information involves the use of automated, electronic, mechanical, or other technological collection techniques or other forms of information technology, e.g., permitting electronic submission of responses, and the basis for the decision for adopting this means of collection. Also describe any consideration of using information technology to reduce burden. [Effective 03/22/01, your response must SPECIFICALLY reference the Government Paperwork Elimination Act (GPEA), which addresses electronic filing and recordkeeping, and what you are doing to adhere to it. You must explain how you will provide a fully electronic reporting option by October 2003, or an explanation of why this is not practicable.]***

In general, 95% of the information can be provided in an electronic format. An exception may be the case where a signature is required such as for the written informed consent that requires a signature from a space flight participant and the execution of reciprocal waiver of claims, which requires signatures from a space flight participant or crew member and the FAA.

4. ***Describe efforts to identify duplication. Show specifically why any similar information already available cannot be used or modified for use for the purpose(s) described in Item 2 above.***

The FAA conducted an internet search and found a chronology on human space flight missions accidents. A top level description of the mission is provided, which includes whether a mishap or accident occurred. Some of this publicly available information can be compiled to fulfill part of the CSLAA's requirement for the operator to inform a space flight participant in writing about the risks of the launch and reentry, including the safety record of the launch or reentry vehicle type.

5. ***If the collection of information has a significant impact on a substantial number of small businesses or other small entities (Item 5 of the Paperwork Reduction Act submission form), describe the methods used to minimize burden.***

N/A

6. ***Describe the consequence to Federal program or policy activities if the collection is not conducted or is conducted less frequently, as well as any technical or legal obstacles to reducing burden.***

If the collection of information, which involves reporting, recordkeeping, and disclosures, is not conducted, the FAA may not be able to make a license or permit determination or the requirements of the CSLAA would not be met. The frequency of collecting the information is contingent upon the number of—

- (a) launch or reentry applications,
- (b) permit applications,
- (c) missions (launch or reentry operations), and
- (d) crew and space flight participants.

7. ***Explain any special circumstances that require the collection to be conducted in a manner inconsistent with the general information collection guidelines in 5 CFR 1320.5(d)(2).***

This requirement follows the guideline in 5 CFR 1320.5(d)(2).

8. ***Describe efforts to consult persons outside the agency to obtain their views on the availability of data, frequency of collection, the clarity of instructions and recordkeeping, disclosure, or reporting format (if any), and on the data elements to be recorded, disclosed, or reported. If applicable, provide a copy and identify the date and page number of publication in the Federal Register of the agency's notice, required by 5 CFR 1320.8(d) soliciting comments on the information collection prior to submission to OMB. Summarize public comments received in response to that notice and describe actions taken by the agency in response to these comments. Specifically address comments received on cost and hour burden.***

FAA published a 60 day notice for public comments in the Federal Register on October 16, 2009, vol. 74, no. 199, page 53314. No comments were received.

9. Explain any decision to provide any payment or gift to respondents, other than remuneration of contractors or grantees.

No decision was made to provide any payment or gift to respondents.

10. Describe any assurance of confidentiality provided to respondents and the basis for the assurance in statute, regulation, or agency policy.

Information collected, including company proprietary information, is protected in accordance with the Freedom of Information Act. Furthermore, in accordance with § 413.9, any person furnishing information or data to the FAA may request in writing that trade secrets or proprietary commercial or financial data be treated as confidential. The request must be made at the time the information or data is submitted, and state the period of time for which confidential treatment is desired.

11. Provide additional justification for any questions of sensitive nature, such as sexual behavior and attitudes, religious beliefs, and other matters that are commonly considered private.

No sensitive information is required.

12. Provide estimates of hour burden of the collection of information.

Presented below are estimates of cost for each section, as appropriate. The FAA assumes that the industry loaded hourly cost is estimated to be \$69.40. In addition, the FAA examined two scenarios. The high mission estimate involves six commercial launch entities over 10 years, while the low mission estimate includes five commercial launch entities over 10 years. The high mission scenario estimated that there will be 10,142 launches over ten years, while the low mission scenario estimated 5,081 launches over ten years.

§ 460.9 Informing crew of launch risk.

14 CFR Part 460.9 requires an operator to inform in writing any individual serving as crew that the United States Government has not certified the launch vehicle as safe for carrying flight crew or space flight participants.

High estimate

This scenario requires 4 person-hours to prepare the initial documentation and one person-hour for each of 1,014.2 annual missions to update, administer and maintain the document. Hence the estimated annual hour burden to comply with §460.9 is:

$$\text{Annual Hour Burden} - (6 \times 4)/10 + (1014.2 \times 1) = 1016.6$$

The estimated average annual cost for companies to inform flight crew in writing that the Government has not certified the launch vehicle as safe is:

$$\text{Annual Cost Burden} - \$69.40 \times 1016.6 = \$70,552$$

Low Estimate

This scenario requires 4 person-hours to prepare the initial documentation and one person-hour for each of 508.1 annual missions to update, administer and maintain the document. Hence the estimated hour burden is:

$$\text{Annual Hour Burden} - (5 \times 4)/10 + (508.1 \times 1) = 510.1$$

The estimated average annual cost for companies to inform flight crew in writing that the Government has not certified the launch vehicle as safe is:

$$\text{Annual Cost Burden} - \$69.40 \times 510.1 = \$35,401$$

§ 460.19 Crew waiver of claims against U.S. Government.

14 CFR Part 460.19 requires each member of a flight crew to execute a reciprocal waiver of claims with the FAA in accordance with Part 440.

High Estimate:

This scenario requires 4 person-hours to prepare the initial documentation and one person-hour for each of 1,014.2 annual missions to administer the document and maintain it as a record. Hence the estimated annual hour burden for §460.19 is:

$$\text{Annual Hour Burden} - (6 \times 4)/10 + (1014.2 \times 1) = 1016.6$$

The estimated average annual cost for companies to prepare the paperwork for crew members to execute a reciprocal waiver of claims with the FAA is:

$$\text{Annual Cost Burden} - \$69.40 \times 1016.6 = \$70,552$$

Low Estimate

This scenario requires 4 person-hours to prepare the initial documentation and one person-hour for each of 508.1 annual missions. Hence, the estimated hour burden is:

$$\text{Annual Hour Burden} - (5 \times 4)/10 + (508.1 \times 1) = 510.1$$

The estimated average annual cost for companies to prepare the paperwork for crew members to execute a reciprocal waiver of claims with the FAA in accordance with the requirements of Part 440 is:

$$\text{Annual Cost Burden} - \$69.40 \times 510.1 = \$35,401$$

§ 460.45 Operator informing space flight participant of risks.

14 CFR Part 460.45 requires an operator to inform each space flight participant in writing about the risks of the launch and reentry, including the safety record of the launch or reentry vehicle type. The operator must present this information in a manner that is understandable to the space flight participant. The space flight participant must provide written informed consent. We assume the operator prepares the informed consent documents and obtain signatures from the space flight participant.

High Estimate:

This scenario requires 120 person-hours to prepare the initial launch risk and consent form documents. We estimate that two person-hours are expended before each of the 613.1 annual missions carrying space flight participants to update and document safety record information and to maintain a record of the signed consent form. Hence, the estimated annual hour burden for §460.45 is:

$$\text{Annual Hour Burden} - (6 \times 120)/10 + (613.1 \times 2) = 1,298.2$$

The estimated average annual cost for companies to inform each space flight participant in writing about the risks of the launch and reentry, including the safety record of the launch or reentry vehicle type, is:

$$\text{Annual Cost Burden} - \$69.40 \times 1,298.2 = \$90,095$$

Low Estimate

This scenario requires 120 person-hours to prepare the initial launch risk and consent form documents. We estimate that two person-hours are expended before each of the 307 annual missions carrying space flight participants to update and document safety record information and to maintain a record of the signed consent form. Hence the estimated annual hour burden for §460.45 is:

$$\text{Annual Hour Burden} - (5 \times 120)/10 + (307 \times 2) = 674$$

The estimated average annual cost for companies to inform each space flight participant in writing about the risks of the launch and reentry, including the safety record of the launch or reentry vehicle type, is:

Annual Cost Burden - $\$69.40 \times 674 = \$46,776$

§ 460.49 Space flight participant waiver of claims against U.S. Government:

14 CFR Part 460.49 requires that each space flight participant execute a reciprocal waiver of claims with the FAA.

High Estimate:

This scenario requires 4 person-hours to prepare the initial documentation for the space flight participant and one person-hour will be incurred for each of the 613.1 annual missions carrying space flight participants to administer the document and maintain it as a record. Hence, the estimated annual hour burden for §460.49 is:

Annual Hour Burden - $(6 \times 4)/10 + (613.1 \times 1) = 615.5$

The estimated average annual cost for companies to prepare the initial documentation for the space flight participant's reciprocal waiver and to administer the document and maintain it as a record is:

Annual Cost Burden - $\$69.40 \times 615.5 = \$42,716$

Low Estimate:

This scenario requires 4 person-hours to prepare initial documentation for the space flight participant and one person-hour will be incurred for each of the 307 annual missions carrying space flight participants to administer the document and maintain it as a record. Hence the estimated annual hour burden for §460.49 is:

Annual Hour Burden - $(5 \times 4)/10 + (307 \times 1) = 309$

The estimated average annual cost for companies to prepare initial documentation for the space flight participant and to administer the document and maintain it as a record is:

Annual Cost Burden - $\$69.40 \times 309 = \$21,445$

High Estimate Annual Cost Summary

<u>Part</u>	<u>Hours</u>	<u>Hourly Rate</u>	<u>Total</u>
460.9	1,016.6	\$69.40	\$70,552
460.19	1,016.6	\$69.40	\$70,552

460.45	1,298.2	\$69.40	\$90,095
460.49	615.5	\$69.40	\$42,716
Total	3,946.9	\$69.40	\$273,915

Low Estimate Annual Cost Summary

<u>Part</u>	<u>Hours</u>	<u>Hourly Rate</u>	<u>Total</u>
460.9	510.1	\$69.40	\$35,401
460.19	510.1	\$69.40	\$35,401
460.45	674	\$69.40	\$46,776
460.49	309	\$69.40	\$21,445
Total	2003.2	\$69.40	\$139,023

Note: On Form 83i, the FAA estimated the answer to 13a as 5.5 respondents. This is the average of the number of launch operators under the high mission scenario (6) and the number under the low mission scenario (5). The FAA estimated the answer to 13b as 763.35. This was derived by taking the average of the number of times that the operator had to complete paperwork under the high and low mission scenarios. For the high mission scenario, 6 operators will need to complete initial documentation paperwork for each of the 4 new requirements (sections 460.9, 460.19, 460.45 and 460.49) as well as complete paperwork prior to each mission (10,142). For the low mission scenario, 5 operators will need to complete initial document paperwork for each of the 4 new requirements (sections 460.9, 460.19, 460.45 and 460.49) as well as completing paperwork prior to each mission (5,081). The FAA then averaged the high and low scenarios and divided by ten to get the total annual responses. The table below shows the derivation of the response to 13b.

Initial Documentation	Number of Missions	Total for 10 years	Total per year
24	10,142	10,166	1,016.6
20	5,081	5,101	510.1
Average			763.35

On Form 83i, the FAA estimated the answer to 13c as 2975.05. This is the average of the annual number of hours under the high mission scenario (3,946.9) and the annual number of hours under the low mission scenario (2,003.2).

The FAA estimates the annual cost burden as \$206,469. This is the average of the annual cost under the high mission scenario (\$273,915) and the annual cost under the low mission scenario (\$139,023).

13. Provide an estimate of the total annual cost burden to respondents or recordkeepers resulting from the collection of information.

Total estimated cost of the rule is presented in item #12 above. No additional costs are required. Other costs incurred by a respondent or recordkeeper, such as obtaining the services of contractors or acquiring additional electronic media or equipment, is at their discretion and is optional and voluntary.

14. Provide estimates of annualized cost to the Federal Government. Also, provide a description of the method used to estimate cost, and other expenses that would not have been incurred without this collection of information.

The FAA finds that much of its application review practices under the rule is consistent with previously-established practice. However, the rule contains five discrete sections having new requirements that resulted in four new requirements ¹ that caused the FAA to perform additional effort in reviewing records pertaining to these sections as summarized in the table below. The FAA estimates that collectively these requirements cause the FAA to expend as much as two person-hours to review each mission and ascertain compliance during oversight activities (e.g., inspection) at commercial operator facilities. The FAA expects to use GS-13 step 5 level personnel with a loaded hourly rate of \$52.04 for this work.

Rule	Title	Potential Effect
§ 460.9	Informing Flight Crew of Launch Risk	Review records
§ 460.19	Flight Crew Waiver of Claims Against U.S. Government	Review records
§ 460.45	Operator Informing Space Flight Participants of Risks	Review records
§ 460.49	Space Flight Participants Waiver of Claims Against U.S. Government	Review records
§ 440.17	Reciprocal Waiver of Claims Requirements	Review records

High Estimate

We estimate that the Federal government expends two person hours to review each mission and ascertain compliance during oversight activities at commercial operator facilities at an average of 1,014.2 missions per year.

Annual Hour Burden – $2 \times 1014.2 = 2,028.4$

This results in an estimated annual cost of \$105,558.

Annual Cost Burden - $\$52.04 \times 2,028.4 = \$105,558$

¹ Reciprocal waivers of claims required by proposed sections 460.19 and 460.49 are executed in accordance with proposed section 440.17.

Low Estimate

We estimate that the Federal government expends two person hours to review each mission and ascertain compliance during oversight activities at commercial operator facilities at an average of 508.1 missions per year.

Annual Hour Burden – $2 \times 508.1 = 1,016.2$

This results in an estimated annual cost of \$52,883.

Annual Cost Burden - $\$52.04 \times 1,016.2 = \$52,883$.

Note: The FAA estimates the annual cost burden as \$79,220. This is the average of the annual cost under the high mission scenario (\$105,558) and the annual cost under the low mission scenario (\$52,883).

15. Explain the reasons for any program changes or adjustments reported in Items 13 or 14 of the OMB Form 83-I.

The reduction on the ROCIS summary burden table from \$206,469 to \$0 is due to the removal of salary-based monetary costs from the summary.

16. For collections of information whose results will be published, outline plans for tabulation and publication. Address any complex analytical techniques that will be used. Provide the time schedule for the entire project, including beginning and ending dates of the collection of information, completion of report, publication dates, and other actions.

In general, the FAA/AST does not intend to publish this information. An exception would be the “publication” of the safety record of launch or reentry vehicles that have carried one or more persons on board, including both U.S. government and private sector vehicles. Publication would be in terms of making this information available on AST’s web site if the FAA chooses this option.

17. If seeking approval to not display the expiration date for OMB approval of the information collection, explain the reasons that display would be inappropriate.

No approval is sought.

18. Explain each exception to the certification statement identified in Item 19, “Certification for Paperwork Reduction Act Submissions,” of OMB Form 83-I.

There are no exceptions.