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Part V

Department of Transportation

Federal Aviation Administration

14 CFR Part 101
Model Rocket Operations; Final Rule

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 101

[Docket No. 26965; Amendment No. 101–6]

RIN 2120–AD84

Model Rocket Operations

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Final rule.

SUMMARY: This action amends the operational guidelines of the Federal Aviation Regulations (FAR) Part 101 for model rockets that: use not more than 125 grams (4.4 ounces) of propellant; are made of paper, wood, or breakable plastic; contain no substantial metal parts; and weigh not more than 1,500 grams (53 ounces). This amendment is necessary to provide for the operation of the technologically advanced, larger category, model rockets and to ensure that their operation is in concert with the maximum level of safety protection for aircraft, flight crews, and the flying public. The FAA believes that this amendment will foster important aeronautical education and research activities, while retaining appropriate operational safety precautions.

EFFECTIVE DATE: November 2, 1994.

FOR FURTHER INFORMATION CONTACT: Mr. Joseph C. White, Air Traffic Rules Branch, ATP–230, Airspace Rules and Aeronautical Information Division, Federal Aviation Administration, 800 Independence Avenue, SW., Washington, DC 20591, telephone (202) 267–8783.

SUPPLEMENTARY INFORMATION:

Background

On May 28, 1985, the National Association of Rocketry (NAR) and the Hobby Industry Association (HIA) filed a joint petition requesting that the FAA amend 14 CFR 101.1, by raising the upper weight limit on excepted model rockets from 16 ounces to 1,500 grams (approximately 53 ounces) and the allowable propellant mass from 4 ounces to 125 grams (approximately 4.4 ounces). At present, 14 CFR 101.1 exempts "model" rockets having no more than 4.0 ounces of propellant and weighing no more than 16 ounces, including the propellent.

In response to the NAR/HIA joint petition, the FAA published a Notice of Proposed Rulemaking (NPRM), Notice 92–12, 57 FR 41628, Sep. 10, 1992. Notice 92–12 proposed to amend 14 CFR Part 101 by adding § 101.22, Special provisions for larger model rockets, and by amending § 101.25, Notice requirements, to accommodate larger model rockets. In summary, model rockets that use not more than 125 grams of propellant; that weigh not more than 1,500 grams, including the propellant; that are constructed principally of paper, wood, or breakable plastic, and continue to have no substantial metal parts; may be operated in a controlled airspace, within 5 miles of the boundary of any airport, within 1,500 feet of any person or property that is not associated with the operations or at night. These operations may be conducted, provided that persons operating these model rockets give prior notification of launch activities and other pertinent launch information to the FAA Air Traffic Control (ATC) facility nearest the place of intended operation between 24 and 48 hours prior to beginning the operation and the manager of any airport whose landing area or runway is within 5 miles of the model rocket launch site.

Analysis of Comments

Interested persons were invited to participate in this rulemaking effort by submitting written data, views, or arguments. All comments received during the comment period were considered before making a determination regarding this final rule.

During the comment period, a total of 117 comments were received in response to Notice 92–12. Two comments were received from the NAR, and one comment each, from the Airline Pilots Association (ALPA), the Arizona Pilots Association, the Airport Transport Association (ATA), and the National Fire Protection Association. Ninety-one comments were received from individuals, eight from pilots, six from model rocket associations, three from teachers/professional educators, and one each from a scientist, an aerospace educational organization, and a model rocket manufacturer. A discussion of these comments follows:

One commenter supports the NPRM as written. All other commenters oppose the NPRM and support, instead, either the original NAR petition or the development of regulatory action which proposes fewer model rocket notification requirements. Comments opposing the NPRM are summarized in the following categories, each of which is subsequently discussed more fully:

1. Approximately 95 commenters state there is no need for a separate category of "Large Model Rockets"; they favor adoption of NAR's original petition for rulemaking.

2. Approximately 74 commenters believe the NPRM's proposed notification requirements are burdensome and unnecessary.

3. Approximately 8 commenters state the FAA needs to update its rules to reflect the current technology of model rocketry and to promote the inherent educational value of the hobby.

4. Approximately 3 commenters oppose both the NPRM and NAR's original petition for rulemaking.

5. Approximately 4 commenters suggest regulatory alternatives to the NPRM.

A number of commenters oppose the proposal to establish a separate category of "Large Model Rockets" and instead support the NAR's original petition to broaden the exempt definition of model rockets. Based upon NAR and FAA studies, commenters argue that air traffic will not be adversely affected by the NAR's requested increase in the maximum, unregulated model rocket liftoff and propellant weight. The NAR reiterates that, "not a single documented incident of model rockets interfering with aviation, hitting or harming aircraft on ascent or descent of the rocket, or impairing aircraft flight operations has occurred". Commenters attribute this enviable safety record to rocketeers' voluntary compliance with the *Model Rocket Safety Code*. Accordingly, they consider the code and a rocketeer's own visual and aural check as sufficient launch safety measures. Moreover, several commenters assert that increasing model rocket weight may actually improve model rocket safety as heavier rockets are purported to have larger drag coefficients, achieve lower altitudes, have shorter flight duration, and be more easily seen by aircraft than lighter rockets.

The FAA agrees that the model rocket industry has a long and distinguished record of safety. However, as noted in Notice 92–12, the FAA must acknowledge the remote, yet inherent increase in hazard potential that accompanies greater model rocket propellant/mass weight. This consideration is particularly relevant for general aviation aircraft and rotorcraft, which operate at a lower velocity and flight altitude, making them especially vulnerable to collision with larger, more powerful model rockets. In order to provide a maximum level of safety protection to aircraft passengers and crew members, the FAA has determined that operational safeguards, beyond the *Model Rocket Safety Code* and rocketeers' own diligence, are needed for larger rockets with greater propellant/mass weight. Therefore, a

regulatory category that segregates larger rockets from smaller rockets is required.

A number of commenters believe that the proposed notification requirements for "Large Model Rocket" launches are unnecessary and burdensome. Commenters argue that the FAA has cited "no cases where notification would have increased air safety above and beyond . . . current regulations which require no notification." Several commenters also mention the potential for conflict to occur between lawful rocketeers and airport/ATC officials who are unfamiliar with model rocketry and with 14 CFR Part 101 entitlement. Two commenters detail occasions where misinformation was believed to have resulted in the denial of waiver applications or the interruption of model rocket launch competitions. Commenters are equally troubled by the requirement to notify air traffic officials within 24 to 48 hours of "Large Model Rocket" launches, regardless of where these launches occur.

The proposed notification requirements assist the FAA and airport officials in determining how model rocket launch activities may affect flight operations in a given area. The proposed requirements are not intended to hinder or minimize model rocket activity, but merely to ensure that airspace is mutually accommodating of both model rocket operations and aircraft operations. To this end, FAA or airport officials review model rocket launch information and make it available to pilots, as necessary, via air traffic control or through Notice to Airmen (NOTAM) publications. NOTAMs highlight events that may result in airspace restrictions and give time frames in which restrictions will be in effect. Review of NOTAMs offers pilots an opportunity to adjust or reschedule their flight plans in light of planned aerial activity. Because a pilot's awareness of model rocket launches enhances this safety process, the proposed notification requirements are beneficial. Additionally, to facilitate disclosure of requested model rocket launch data, the NPRM proposed a decrease in the amount and specificity of information currently required from rocketeers. For example, when there are multiple participants at a single event, rather than give names and addresses for every rocketeer, a single person may be designated as the event launch coordinator for the operation. Similarly, rather than provide the specific number, size, weight, and maximum altitude of each rocket to be launched, the appropriate individual may estimate the information. The FAA further concludes that the current level of safety will not be decreased by utilizing the less restrictive reporting requirements as proposed in the NPRM when a single name and address of the person provided is that of the event launch coordinator, and this person is the one who has provided the other required launch data estimates for that event.

Several commenters recommend that notification of the airport manager or FAA tower facility be required only when large model rockets will be launched into controlled airspace or within 5 miles of an airport.

The current prohibition against operating such model rockets in controlled airspace, within 5 miles of an airport, within 1,500 feet of any non-participant, or between sunset and sunrise, will not apply provided the person operating the model rocket complies with the proposed modified provisions of § 101.25. The intent of the notice requirement is not to exclude or hinder model rocket operations, but to provide notification of such operations to afford an adequate level of safety for person and property in the air, as well as on the ground.

Commenters maintain that the notice requirement is unrealistic for several reasons: Model rocket launch times are inherently unpredictable as they are dependent upon favorable cloud cover and weather conditions; many impromptu launches occur at model rocket meets, making it difficult to give prior disclosure of the total number of participants and other launch information; the notification process may prove too complex for novice or youthful rocketeers; and, the notification process is likely to be cost intensive to the FAA, as the agency will be forced to process a presumably high number of waiver applications.

The FAA disagrees that the notification process may prove too complex for novice or youthful rocketeers. Through voluntary compliance with the *Model Rocket Safety Code,* model rocketeers of all ages have proven a ready aptitude and willingness for ensuring launch safety and have demonstrated an awareness of how to knowledgeably operate scientific equipment. The effective handling of these important responsibilities is believed to be an accurate indicator of rocketeers' ability to adhere to the proposed notification requirements. The FAA acknowledges that the agency will incur costs in receiving, recording, and evaluating notification information; but, the agency determines these costs to be minor.

Several commenters believe the FAA needs to update 14 CFR Part 101 to reflect the current technology of model rocketry and to promote the inherent educational value of the hobby. According to the NAR, original model rocket limitations were set in light of what was the only foreseeable type of model rocket propellant at the time, black powder. Over the years, new propellant technologies have emerged that are vastly superior to black powder, both in terms of specific impulse and a capability to accommodate more complex payloads, e.g. cameras, radio control receivers, and computer equipment. One commenter mentions that it is difficult to construct these payloads while remaining within the present 16 ounce total weight limitation. Most commenters agree that the more diverse payloads available with larger-sized rockets present unique opportunities for promoting scientific study. Teachers and rocketry clubs report using larger rockets as educational aids. Science professionals use them in collecting data and conducting analysis. These groups believe their efforts help the United States remain academically and technologically competitive. As such, they assert that the FAA's proposed restrictions on large model rockets are counterproductive to scientific achievement and overall growth of the model rocket industry.

Three major factors form the basis of the proposed amendment: (1) The FAA's support in fostering public interest in aeronautics through model rocketry; (2) the agency's recognition of the importance for model rocketeers to utilize state-of-the-art technology to enhance educational value and international competitiveness; and (3) the agency's responsibility to ensure aircraft flight safety. Accordingly, the proposed amendment reflects the FAA's desire to support the advancement of model rocketry while maintaining an assurance that larger and faster rockets do not jeopardize the safety of aircraft in flight.

Several commenters oppose both the NPRM and NAR's original petition. The Air Line Pilots Association (ALPA) and the Air Transport Association (ATA) believe that the larger and more powerful rockets pose a potential threat to air traffic safety. Both organizations underscore the point that larger model rockets are capable of achieving aircraft cruising altitudes. In this regard, ALPA believes collision with a model rocket can cause aircraft damage beyond that "comparable to the impact of large hailstones" and that penetration of the aircraft wing skin is likely. For this reason, ALPA believes that the current provisions of 14 CFR Part 101 best ensure safety and recommends that the

notification requirements be applied to any rocket firing surpassing 1500 feet above ground level (AGL), regardless of airport proximity. Additionally, ALPA recommends that a safety officer should visually survey rocket firings in controlled areas and manufacturers should provide a copy of applicable FAA regulations relating to launch activities. The ATA favors ensuring safety by permitting no unmanned rockets within a 30-mile radius of regulated airspace.

The FAA acknowledges a minimal risk increase in hazard potential that accompanies the operation of larger, more powerful rockets. This minimal risk increase was confirmed by a March 1991 FAA study, Model Rocketry Hazard Study, conducted as part of the agency's analysis of in-flight collision probability between aircraft and model rockets. In concert with the study's final report recommendation, Notice 92–12 proposed certain guidelines for large model rocket launches. These proposed guidelines, together with rocketeers' proven launch safety vigilance, effectively lessen the minimal risk increase in hazard potential associated with heavier model rockets.

One commenter concurs with the safety concerns raised by ATA and ALPA and alleges that hazardous incidents have occurred with larger model rockets. This commenter believes that present technology offers model rockets sufficient propellant capacity so that the FAA should set a maximum allowable rocket weight of 3 pounds and hold propellant mass to a maximum 62.5 grams. To further ensure safety, this commenter recommends that the FAA establish clear, defined limits for model rocket construction material. The commenter contends that "hi-tech" paper and plastic are being used to construct more durable rockets than 14 CFR 101 intends.

No data was provided by the commenter to support the allegation, and the FAA has no other data which substantiates any occurrence of hazardous instances with larger model rockets. The FAA shares the viewpoint that model rockets only be constructed of paper and other breakable material. To reiterate this agency intent, Notice 92–12 maintains the current language of § 101.1(c), which outlines appropriate material for model rocket construction. However, to issue explicit direction on the manufacture of model rockets, which appears to be the commenter's suggestion, goes beyond the FAA's regulatory purview.

Several commenters asked that the FAA create a uniform set of regulations pertaining specifically to model rockets weighing greater than 53 ounces launch weight.

The FAA acknowledges the commenters' suggestions and concerns. However, since Notice 92–12 conveyed only those proposals contained in the original NAR petition. Recommendations to create an additional set of uniform rules specifically for model rockets would be a separate rulemaking action and is beyond the scope of this particular action.

The NAR and several other commenters assert that an apparent typographical error in Notice 92–12 incorrectly reports the NAR's estimate of model rocket launches as 250,000 since the inception of the sport. Commenters state that the appropriate number, as submitted in NAR's 1985 study, is 250,000,000.

The FAA has investigated the commenters' assertion and noted that Notice 92–12 reference was "250,000 launches of model rockets since the inception of the sport . . ." The estimate, as contained in the NAR report is, "At the time the NAR's petition was submitted in 1985, NAR informed the FAA that more than 250,000,000 launches had been made." Because the number of launches of model rockets since the inception of the sport was not used in any FAA rulemaking calculations, the correct figure is hereby noted in this document and has no further bearing on this rulemaking activity.

Regulatory Evaluation Summary

Cost-Benefit Analysis

The FAA has determined that this final rule is not a "significant regulatory action", as defined by Executive Order 12866 (Regulatory Planning and Review). The anticipated costs and benefits associated with this final rule are summarized below. (A detailed discussion of costs and benefits is contained in the full evaluation in the docket for this final rule).

Costs

The final rule for unmanned rockets consists of provisions that specify what persons operating certain model rockets (rockets using not more than 125 grams of propellant; made of paper, wood, or breakable plastic; containing no substantial metal parts, and weighing not more than 1500 grams including propellant) would be required to do. The final rule is designed to accommodate the advancement of model rocketry with regulations that will also provide an adequate level of assurance that such rockets will not jeopardize the safety of aircraft in flight.

The FAA estimates that the changes in the final rule will have a no cost impact to users of model rockets. In fact, the changes might produce a cost savings. The savings associated with these changes, however are considered negligible and unquantifiable.

Section 101.22(a)(2), however, may impose minor costs on the FAA. Persons operating model rockets will have to provide the information required in existing § 101.25 to the manager of that airport and to the FAA ATC facility that is nearest the place of the intended operation. The FAA would then incur costs associated with receiving, recording, and evaluating the material that has been received. The FAA believes that these costs will be minor.

Benefits

The final rule will provide benefits, in that the FAA has determined that the final regulations will accommodate the advancement of model rocketry and simultaneously provide an adequate level of assurance that such rockets will not jeopardize the safety of aircraft in flight.

Conclusions

Based upon the fact that there are little or no compliance costs coupled with the potential benefits, the FAA concludes that the final rule is cost beneficial.

Regulatory Flexibility Determination

The Regulatory Flexibility Act of 1980 (RFA) was enacted by Congress to ensure that small entities are not unnecessarily and disproportionately burdened by government regulations. The RFA requires agencies to review rules that may have "a significant cost impact on a substantial number of small entities."

With regards to this regulatory evaluation, there is no cost associated with any of the amendments. The FAA has determined that the amendments contained herein will not have a significant economic impact on a substantial number of small entities.

International Trade Impact Assessment

The amendments apply to users of model rockets in the United States only There is no economic impact resulting from any of the amendments and the FAA has determined that these regulations will not have an impact on international trade.

Federalism Determination

The regulations adopted herein will not have substantial direct effects on the

states, on the relationship between the national government and the states, or on the distribution of power and responsibilities among the various levels of government. Therefore, in accordance with Executive Order 12612, it is determined that this proposal would not have sufficient federalism implications to warrant the preparation of a Federalism Assessment.

Paperwork Reduction Act

The information collection requirements of part 101 were previously approved under OMB Control No. 2120–0027. This amendment makes only minor changes to those requirements.

International Civil Aviation Organization and Joint Aviation Regulations

In keeping with the U.S. obligations under the convention on International Civil Aviation (ICAO), it is FAA policy to comply with ICAO Standards and Recommended Practices (SARP) to the maximum extent practicable. The FAA has determined that this regulation complies with the ICAO SARP.

Conclusion

For the reasons discussed in the preamble, and based on the findings in the Regulatory Flexibility Determination and the International Trade Impact Assessment, the FAA has determined that this regulation is not a "significant regulatory action" under Executive Order 12866. This rule is not considered significant under DOT Order 2100.5, Policies and Procedures (44 FR 11034, February 26, 1979). In addition, the FAA certifies that this rule will not have a significant economic impact, positive or negative, on a substantial number of small entities under the criteria of the Regulatory Flexibility Act. A regulatory evaluation of the final rule, including a Regulatory Flexibility Determination and Trade Impact Assessment, has been placed in the docket. A copy may be obtained by contacting the person identified under **FOR FURTHER INFORMATION CONTACT.**

List of Subjects in 14 CFR Part 101

Aircraft, Aviation Safety, Federal Aviation Administration, Recreation and recreation areas.

The Amendment

In consideration of the foregoing, the Federal Aviation Administration finds that it would be in the public interest to adopt the amendment as proposed. Accordingly, pursuant to the authority delegated to me, the Federal Aviation Administration amends part 101 of the Federal Aviation Regulations (14 CFR Part 101) as follows:

1. The authority citation for Part 101 continues to read as follows:

Authority: 49 U.S.C. App. 1348, 1354, 1372, 1421, 1442, 1443, 1472, 1510, and 1522; E.O. 11514; 49 U.S.C. 106(g).

Subpart C—Unmanned Rockets

2. Section 101.22 is added to read as follows:

§ 101.22 Special provisions for large model rockets.

Persons operating model rockets that use not more than 125 grams of propellant; that are made of paper, wood, or breakable plastic; that contain no substantial metal parts, and that weigh not more than 1,500 grams, including the propellant, need not comply with § 101.23 (b), (c), (g), and (h), provided:

(a) That person complies with all provisions of § 101.25; and

(b) The operation is not conducted within 5 miles of an airport runway or other landing area unless the information required in § 101.25 is also provided to the manager of that airport.

3. Section 101.25 is amended by revising the introductory text and paragraphs (a), (b), (c), and (d) to read as follows:

§ 101.25 Notice requirements.

No person may operate an unmanned rocket unless that person gives the following information to the FAA ATC facility nearest to the place of intended operation no less than 24 hours prior to and no more than 48 hours prior to beginning the operation:

(a) The names and addresses of the operators; except when there are multiple participants at a single event, the name and address of the person so designated as the event launch coordinator, whose duties include coordination of the required launch data estimates and coordinating the launch event;

(b) The estimated number of rockets to be operated;

(c) The estimated size and the estimated weight of each rocket; and

(d) The estimated highest altitude or flight level to which each rocket will be operated.

* * * * *

Issued in Washington, DC, on September 26, 1994.

David R. Hinson,

Administrator.

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