



# **NATIONAL AERONAUTICS AND SPACE ADMINISTRATION {NASA} CENTENNIAL CHALLENGES PROGRAM 20-20-20- Airship CHALLENGE Competition Requirements, Rules & Technical Document REQUEST FOR INFORMATION {RFI}**

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Agency: National Aeronautics and Space Administration  
Office: Marshall Space Flight Center  
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Synopsis:  
Added: Mar 22, 2016 9:53 am  
1. SUMMARY

The Centennial Challenges Program is NASA's flagship program for technology prize competitions ([www.nasa.gov/challenges](http://www.nasa.gov/challenges)). The program is an integral part of NASA's Space Technology Mission Directorate, which is innovating, developing, testing, and flying hardware for use in NASA's future missions. The Centennial Challenges Program directly engages the public, academia, and industry in open prize competitions to stimulate innovation in technologies that have benefit to NASA and the nation. For more information about NASA's Space Technology Mission Directorate, visit: <http://www.nasa.gov/spacetech>. The Centennial Challenges program is seeking input on the Challenge Competition Requirements, Rules & Technical Document for the proposed stratospheric Airship 20-20-20 Challenge. The Challenge focuses on building and launching a lighter-than-air, powered, maneuverable airship operating in the stratosphere, while carrying a nominal payload for a pre-defined time period.

This RFI seeks: (1) to gather feedback on the proposed competition requirements and rules; and (2) to determine the interest level in potentially competing in this challenge. Responses should be

submitted in Adobe PDF or Microsoft Word format and are limited to five (5) pages in length. Responses should include (as applicable): name, address, email address, and phone number of the respondent, business, or organization, with point of contact for business or organization.

This RFI seeks feedback from potential challengers. Comments must be submitted in electronic form no later than 5:00pm Eastern Time on May 6, 2016 to Ms. Monsi Roman at e-mail address: HQ-STMD-CentennialChallenges@mail.nasa.gov. Please use 2020 Challenge Rules on the Subject line.

NASA welcomes all segments of industry, academia, and government, including associations, innovators, and enthusiasts to reply to this RFI. This RFI is for informational/planning purposes only and the Government will not be responsible for any cost associated with preparing information in support of this RFI. This RFI is NOT to be construed as a commitment by the government to enter into any agreement or other obligation or to conduct a 20-20-20 Airship Challenge. This notice is issued in accordance with the NASA Prize Authority, 51 U.S.C. § 20144. Responses may be made available for public review and should not include proprietary information. Submitted information will be shared within NASA and with contractor personnel associated with the NASA Centennial Challenges Program. All responses are to be for general access by government reviewers.

For general information on the NASA Centennial Challenges Program see: <http://www.nasa.gov/challenges>. The point of contact is Ms. Monsi Roman, Program Manager, Centennial Challenges Program, NASA Marshall Space Flight Center.

## 2. BACKGROUND

NASA is considering a stratospheric airship challenge to incentivize the demonstration of a long duration scientific platform for both Earth and space sciences. In 2013, a Keck Institute (<http://kiss.caltech.edu/>) study (Airships: A New Horizon for Science) demonstrated significant interest in airships as a science platform from the academic community and possible industrial partners. The final study report can be found at <http://kiss.caltech.edu/study/airship/final-report.pdf>.

There are few opportunities for space missions in astronomy and Earth science. Airships (powered, maneuverable, lighter-than-air vehicles that can navigate a designated course) could offer significant gains in observational persistence over local and regional areas, sky and ground coverage, data downlink capability, payload flexibility, and over existing suborbital options at competitive prices. We seek to spur a demonstration of the capability for sustained airship flights as astronomy and Earth science platforms in a way that is complementary with broad industry interests.

An RFI released in October 2014 was used to determine the interest level in potentially competing in this challenge, gauge potential interest from the science community in using airships as a scientific platform, understand the applicability of the challenge capabilities for other non-government applications, and determine the interest level in administering the challenge (as an allied organization) or partnering on payload development.

## 3. CHALLENGE DESCRIPTION

The 20-20-20 Airship Challenge is a two-tiered challenge that provides opportunities to evaluate a wide range of innovative methods to launch an airship into the stratosphere, maintain altitude, and station-keep for a defined period of time. This challenge would seek to engage the aerospace industry, educational institutions, and amateurs to provide solutions. The challenge would award seed money to the first 10 Teams to present and pass an Airship scalability review (~\$20K per team). The Challenge would award prizes for successful demonstration of a stratospheric airship that would be required to accomplish the following tasks (summarized in Table 1):

- Reach a minimum altitude of 20 km.
- Maintain the altitude for 20 hours (200 hours for Tier 2 competition)
- Remain within a 20 km diameter station area (and navigate between two designated points for Tier 2)
- Successfully return the 20 kg payload (200 kg for Tier 2 competition) and payload data.
- Show Airship scalability for longer duration flights with larger payloads through a scalability review.

Table 1.

Key Challenge Requirements	Tier 1	Tier 2
Altitude (km)	20	20
Duration (hr)	20	200
Payload mass (kg)	20	200
Station keeping diameter (km)	20	20
Path traversing	No	Yes
Airship scalability review	Yes	Yes

#### 4. DRAFT CHALLENGE RULES AND COMPETITION STRUCTURE

See attached document: Competition Requirements, Rules and Technical Document

#### 5. INFORMATION SOUGHT from Potential Competitors

- Please remark on the proposed judging format.
- Please comment on Rule 2.I, particularly 2.I.ii., regarding the competitor team agreeing to negotiate in good faith with NASA for a grant of a nonexclusive, nontransferable, irrevocable, license to practice or have practiced for or on behalf of the United States, the intellectual property throughout the world, at reasonable compensation, if NASA chooses to pursue such a license.
- Please comment on the wind speed operation requirement, Rule 6.A: The airship shall operate under stratospheric wind speeds less than 15 m/s.
- Please comment on the proposed wind speed validation measurement plan.
- Please comment on the proposed preflight checklist and propose additions to the list.
- Please comment on the airship deviation rules and conditions. (Rule 10.E and 11.D).
- Please comment on the inclement weather or unexpected weather rules (Rule 11), particularly on thirty day assigned period for re-demonstration and the two day extension for repairs.
- Please remark on the proposed Airship Traversing scenario (Rule 16).

- Please comment on the scalability review requirements (Section 4.5)
- Please comment on the proposed Data Submission format and method.
- Please comment on any other concerns regarding technical requirements, or aspects of the challenge competition Milestones and Rules that should be added, modified, or deleted.

## 6. ELIGIBILITY TO PARTICIPATE IN CHALLENGES

In the event that NASA does initiate this challenge, NASA will post a public notice in the Federal Register. At that time, all individuals or entities that wish to participate in the challenge must register as members of a team and enter into an agreement with the designated challenge management organization. Teams foreign and domestic may compete in the challenge, although teams that include foreign nationals who are not permanent residents of the United States may not receive prize money for these competitions. The sole exception is for U.S based educational institutions and entities, which may have up to 50% foreign national members on their teams. No team members may be from countries listed on the NASA list of designated countries. (The current list of designated countries can be found at <http://oir.hq.nasa.gov/nasaecp/>).

Teams cannot include any Federal entity or Federal employee acting within the scope of their employment. This includes any U.S. Government organization or organization principally or substantially funded by the Federal Government, including Federally Funded Research and Development Centers, Government-owned, contractor operated (GOCO) facilities, and University Affiliated Research Centers.

NASA and other federal agencies may work with and provide technical support to participating teams as long as it is done on an equitable basis. That is, similar requests are dealt with in a similar fashion, be it access to facilities, testing, scientific consultation, or other services. This does not obligate NASA or other federal agencies to provide the support. These services may be at no cost or on a cost reimbursable basis as determined by the subject federal agency in accordance with law and policy.

Registration and participation in a challenge does not entitle a participant to a NASA-funded prize. To be eligible to win a NASA funded prize, the competitor must (1) register and comply with all requirements in the rules and enter into a team agreement; (2) in the case of a private entity, shall be incorporated in and maintain a primary place of business in the United States, and in the case of an individual, whether participating singly or in a group, shall be a citizen or permanent resident of the United States; and (3) shall not be a Federal entity or Federal employee acting within the scope of their employment.

## 7. FOR FURTHER INFORMATION CONTACT:

This RFI seeks feedback on the competition rules and structure and/or interest in competing in any or all Challenge phases. Comments must be submitted no later than 5:00pm Eastern Time on May 6, 2016 to Ms. Monsi Roman at e-mail address: [HQ-STMD-CentennialChallenges@mail.nasa.gov](mailto:HQ-STMD-CentennialChallenges@mail.nasa.gov). Use 2020 Challenge Rules on the Subject line.

For general information on the NASA Centennial Challenges Program see: <http://www.nasa.gov/challenges>. The point of contact is Ms. Monsi Roman, Program Manager,

Centennial Challenges Program, Marshall Space Flight Center at e-mail address: HQ-STMD-CentennialChallenges@mail.nasa.gov.

## **202020 Rules Requirements**

Type: Other (Draft RFPs/RFIs, Responses to Questions, etc..)

Posted Date: March 22, 2016

[202020 Rules Requirements Dec 2015.pdf](#) (591.97 Kb)

Description: 202020 Rules Requirements

[202020 RFI2 Response Form.docx](#) (24.55 Kb)

Description: 202020 Response Form

Contracting Office Address:

NASA/George C. Marshall Space Flight Center, Office of Procurement  
Marshall Space Flight Center, Alabama 35812

United States

Primary Point of Contact.: Melinda E Swenson, Contracting Officer

[melinda.e.swenson@nasa.gov](mailto:melinda.e.swenson@nasa.gov)

Phone: 2565440381

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## **All Files**

[202020 Rules Requirements](#) 

Mar 22, 2016

[202020 Rules Requirements Dec 2015.pdf](#)

[202020 RFI2 Response Form.docx](#)