NASA Airborne Research Experience for Educators (AREE) Application Supporting Statement

NASA Dryden Flight Research Center is requesting approval for the collection of data for the Airborne Research Experience for Educators (AREE) project. The collection process will consist of an application, resume, and letters of reference. Collected data will be used to select 10 secondary educators (grades 7-12), who specialize in science, technology, engineering, or mathematics (STEM), to participate in a six week end-to-end airborne science research experience.

A. Justification

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.

NASA's founding legislation, the Space Act of 1958, directs the agency to expand human knowledge of Earth and space phenomena and to preserve the role of the United States as a leader in aeronautics, space science, and technology. High achievement in science, technology, engineering, and mathematics (STEM) education is essential to the accomplishment of NASA's mission. The Strategic Management of Human Capital initiative under the President's Management Agenda requires agencies to "build, sustain, and effectively deploy the skilled, knowledgeable, diverse, and high-performing workforce needed" to meet agency core competencies. NASA's education investments will contribute to the agency's human capital needs.

All of NASA's education efforts are part of an integrated agency-wide approach to human capital management. Within the NASA Strategic Plan, education is identified as a cross-cutting function that supports all of the agency's strategic goals and objectives. NASA delivers a comprehensive agency education portfolio—a collection of investments and strategies, such as research and development, managed to further common goals—implemented by the Office of Education, the NASA mission directorates, and the NASA centers. Through the portfolio NASA contributes to our nation's efforts in achieving excellence in STEM education. Three outcomes serve to align all agency education activities:

- **Outcome 1: Strengthen NASA and the nation's future workforce**—NASA will identify and develop the critical skills and capabilities needed to achieve the Vision for Space Exploration. To help meet this demand, NASA will continue contributing to the development of the nation's future STEM workforce through a diverse portfolio of education initiatives that target America's students at all levels, especially those in traditionally underserved and underrepresented communities.
- **Outcome 2: Attract and retain students in STEM disciplines**—To compete effectively for the minds, imaginations, and career ambitions of America's young people, NASA will focus on engaging and retaining students in STEM education programs to encourage their pursuit of educational disciplines critical to NASA's future engineering, scientific, and technical missions.

- **Outcome 3: Engage Americans in NASA's mission**—NASA will build strategic partnerships and linkages between STEM formal and informal education providers. Through hands-on, interactive, educational activities, NASA will engage students, educators, families, the general public, and all agency stakeholders to increase Americans' science and technology literacy.

As the United States begins the second century of flight, the nation must maintain its commitment to excellence in STEM education to ensure that the next generation of Americans can accept the full measure of their roles and responsibilities in shaping the future.

NASA requires the voluntary collection of information from the public to support the NASA Airborne Research Experience for Educators (AREE) program. The information to be collected is the application, a resume, and letters of reference to determine eligibility of applicants to participate in the program. The AREE project will select 10 secondary educators (grades 7-12), who specialize in science, technology, engineering, or mathematics (STEM), to participate in a six week end-to-end airborne science research experience.

The AREE project was developed at Dryden to support the Education Flight Projects program under the auspices of the Teaching From Space (TFS) program. TFS is a NASA Education office co-located with the Astronaut Office at the NASA Johnson Space Center. Education Flight Projects and its associated activities are under the TFS umbrella and are managed by the JSC Education Office. Education Flight Projects provide opportunities for K-12 students and educators to gain hands-on experience as investigators using NASA flight platforms. Activities are national in scope.

The AREE project will provide education opportunities for educators that use the unique environment of NASA flight platforms. Furthermore, the project will support NASA's strategic mission to streamline individuals into a seamless pipeline to pursue careers in science, technology, engineering, and mathematics, or STEM, by engaging participants in hands-on experiences relating to flight test research and airborne science.

As part of the NASA Education Elementary and Secondary Education Program, Education Flight Projects serves as a major link in the student pipeline and maps to NASA Education Outcome 2:

> ***Attract and retain students in science, technology, engineering, and mathematics (STEM) disciplines through a progression of educational opportunities for students, teachers, and faculty.***

Education Flight Projects at Dryden uses NASA's unique content and experiences for K-12 students and educators to inspire and engage them in STEM subjects. Effort is focused to meet three goals:

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1. Develop education opportunities that use NASA Dryden flight platforms to provide educators with the skills and knowledge to attract and retain students in STEM disciplines.
2. Facilitate flight and science research experiences at Dryden that provide unique opportunities to inspire, engage, and educate the Nation's future workforce.
3. Expose participants to NASA-related content, knowledge, people, and facilities to invigorate their commitment and understanding in STEM disciplines.

These goals provide the basis to support the strategic goal, objectives and outcomes of the Elementary and Secondary Education Program.

The three Elementary and Secondary Program Objectives that Education Flight Projects supports are:

2.1 Educator Professional Development – Short Duration
Objective (Engage)

Provide short duration professional development and training opportunities to educators, equipping them with the skills and knowledge to attract and retain students in STEM disciplines.

2.3: Curricular Support Resources
Objective (Engage)

Provide curricular support resources that use NASA themes and content to enhance student skills and proficiency in STEM disciplines; and/or inform students about STEM career opportunities; and/or communicate information about NASA's mission activities.

2.4 Student Involvement K-12
Objective (Engage)

Provide K-12 students with authentic, first-hand opportunities to participate in NASA mission activities, thus inspiring interest in STEM disciplines and careers.

NASA Airborne Research Experience for Educators (AREE) will collect information to determine the eligibility of applicants to participate in the program. Ten secondary educators will be selected to participate based on their experience and educational background. These teachers immediately will use their experiences with the AREE project to design and present engaging classroom activities for their students. The project also will serve as the first step to an expanded program, in subsequent years, to involve middle and high school students with flight project activities on NASA's DC-8 aircraft.

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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 NASA Airborne Research Experience for Educators (AREE) application will be accessible from the National Suborbital Education and Research Center (NSERC) website of the University of North Dakota, a NASA partner in this program at http://www.nserc.und.edu/learning/AREE.html. NSERC was formed by NASA and the University of North Dakota to facilitate Earth system science research using the DC-8 aircraft. Applicants who are interested in participating in the AREE project can access program information and the application from this website. Interested applicants will voluntarily submit an application, resume, and letters of reference electronically to the AREE project manager. This information will then be used to select qualified applicants for the program.

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.*

Applicants will complete an online application hosted on the NSERC website at http://www.nserc.und.edu/learning/AREE.html. The application can be downloaded using Adobe software and submitted electronically using the e-mail submit button located on the form. The collection of information from the application, resume, and letters of reference will all occur electronically.

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

No duplication is involved. Application to participate in the NASA Airborne Research Experience for Educators is unique.

5. If the collection of information impacts small businesses or other small entities (Item 5 of OMB Form 83-I), describe any methods used to minimize burden.

Small businesses will not be impacted.

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.

NASA needs certain information to determine which applicants meet required selection criteria and to what extent. Without this data collection, NASA will not be able to select 10 educators

to participate in the program. Applications for participants have to be obtained prior to the end of the traditional school year before educators have completed their 2008-2009 school years. If applications are not received to determine who to select for the program, educators will forego a unique opportunity to obtain skills and knowledge to attract and retain students in STEM disciplines. Furthermore, the opportunity for educators to gather in-flight data using sensor instruments aboard NASA's DC-8 aircraft is a unique experience that will invigorate their commitment and understanding in STEM disciplines. Failure to implement this project will limit the ability for the Education Flight Project program to support NASA Outcome 2 as stated in the *Education Strategic Coordination Framework*, 2006:

> Attract and retain students in STEM disciplines through a progression of educational opportunities for students, teachers, and faculty.

7. Explain any special circumstances that would cause an information collection to be conducted in a manner:
** requiring respondents to report information to the agency more often than quarterly;*
** requiring respondents to prepare a written response to a collection of information in fewer than 30 days after receipt of it;*
** requiring respondents to submit more than an original and two copies of any document;*
** requiring respondents to retain records, other than health, medical, government contract, grant-in-aid, or tax records, for more than three years;*
** in connection with a statistical survey, that is not designed to produce valid and reliable results that can be generalized to the universe of study;*
** requiring the use of a statistical data classification that has not been reviewed and approved by OMB;*
** that includes a pledge of confidentiality that is not supported by authority established in statute or regulation, that is not supported by disclosure and data security policies that are consistent with the pledge, or which unnecessarily impedes sharing of data with other agencies for compatible confidential use; or*
** requiring respondents to submit proprietary trade secrets, or other confidential information unless the agency can demonstrate that it has instituted procedures to protect the information's confidentiality to the extent permitted by law.*

The application period must be open and closed within 30 days due to the limited amount of time required to select and notify applicants. Applications for participants have to be obtained prior to the end of the traditional school year before educators have completed their 2008-2009 school years for three reasons:

- To allow selected applicants sufficient time to prepare and plan for a 6-week summer research experience that begins on July 6, 2009.
- It requires 30 days to receive a security clearance from the Dryden Aircraft Operations Facility where the research flights in the program are taking place.
- To optimize the number of educators who receive the announcement of opportunity about the program. Secondary educators will complete their 2008-2009 school year employment obligations by mid-June (at the latest). Consequently, many K-12 educators

pursue other interests (i.e. vacation or alternative employment opportunities) and will not be available to apply for this opportunity.

The collection of data must begin no later than June 01, 2009 and remain open for no more than two weeks to account for these conditions.

8. 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. Describe efforts to consult with 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. Consultation with representatives of those from whom information is to be obtained or those who must compile records should occur at least once every 3 years - even if the collection of information activity is the same as in prior periods. There may be circumstances that may preclude consultation in a specific situation. These circumstances should be explained.

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

N/A

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

Applicants will be required to submit limited personally identifiable information electronically to the AREE project manager. The information will be used only to determine qualified applicants for the program and will not be accessible to the public. In addition to the project manager, only highly qualified individuals familiar with education and the AREE program who participate in the selection process will have access to the collected information.

A Privacy Impact Assessment is being completed and submitted by the Privacy Act Manager at Dryden.

11. Provide additional justification for any questions of a sensitive nature, such as sexual behavior and attitudes, religious beliefs, and other matters that are commonly considered private. This justification should include the reasons why the agency considers the questions necessary, the specific uses to be made of the information, the explanation to be given to persons from whom the information is requested, and any steps to be taken to obtain their consent.

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Only questions relevant to the teachers' applications to the program or other demographic data on the applicant are being gathered. All data gathered will only be used in conjunction with this program.

12. Provide estimates of the hour burden of the collection of information. The statement should:
** Indicate the number of respondents, frequency of response, annual hour burden, and an explanation of how the burden was estimated. Unless directed to do so, agencies should not conduct special surveys to obtain information on which to base hour burden estimates. Consultation with a sample (fewer than 10) of potential respondents is desirable. If the hour burden on respondents is expected to vary widely because of differences in activity, size, or complexity, show the range of estimated hour burden, and explain the reasons for the variance. Generally, estimates should not include burden hours for customary and usual business practices.*
** If this request for approval covers more than one form, provide separate hour burden estimates for each form and aggregate the hour burdens in Item 13 of OMB Form 83-I.*
** Provide estimates of annualized cost to respondents for the hour burdens for collections of information, identifying and using appropriate wage rate categories. The cost of contracting out or paying outside parties for information collection activities should not be included here. Instead, this cost should be included in Item 13.*

There are only 10 educator participants in this new experiential program. It is unknown how many applicants will apply, however the commitment required of the educators and the modest stipend involve suggest that an applicant pool of 25 would presage an excellent response. The application will require no more than one hour to complete per applicant for a total of approximately 25 burden hours.

13. Provide an estimate for the total annual cost burden to respondents or recordkeepers resulting from the collection of information. (Do not include the cost of any hour burden shown in Items 12 and 14).
** The cost estimate should be split into two components: (a) a total capital and start-up cost component (annualized over its expected useful life) and (b) a total operation and maintenance and purchase of services component. The estimates should take into account costs associated with generating, maintaining, and disclosing or providing the information. Include descriptions of methods used to estimate major cost factors including system and technology acquisition, expected useful life of capital equipment, the discount rate(s), and the time period over which costs will be incurred. Capital and start-up costs include, among other items, preparations for collecting information such as purchasing computers and software; monitoring, sampling, drilling and testing equipment; and record storage facilities.*
** If cost estimates are expected to vary widely, agencies should present ranges of cost burdens and explain the reasons for the variance. The cost of purchasing or contracting out information collections services should be a part of this cost burden estimate. In developing cost burden estimates, agencies may consult with a sample of respondents (fewer than 10), utilize the 60-day pre-OMB submission public comment process and use existing economic or regulatory impact analysis associated with the rulemaking containing the information collection, as appropriate.*

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** Generally, estimates should not include purchases of equipment or services, or portions thereof, made: (1) prior to October 1, 1995, (2) to achieve regulatory compliance with requirements not associated with the information collection, (3) for reasons other than to provide information or keep records for the government, or (4) as part of customary and usual business or private practices.*

a) There is no cost to applicants to apply.
b) Costs for the design and collection of the electronic applications is being covered by the University of North Dakota National Suborbital Education and Research Center as part of the partnership with NASA on the AREE program.

14. Provide estimates of annualized costs to the Federal government. Also, provide a description of the method used to estimate cost, which should include quantification of hours, operational expenses (such as equipment, overhead, printing, and support staff), and any other expense that would not have been incurred without this collection of information. Agencies may also aggregate cost estimates from Items 12, 13, and 14 in a single table.

Annualized costs for the application and selection process for teacher participants in the AREE program to the Federal government are estimated at $4000 based on the time of the program manager and selection panel members. This is estimated to be 40 total hours at a loaded cost of $100/hour.

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

N/A

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.

The opening of the application window for the NASA Airborne Research Experience for Educators (AREE) will be publicized through the NSERC website and via existing mechanisms used to inform the education audience of products and services available to them by NASA (e.g. e-mail list servers).

The collection of information should begin no later than June 01, 2009 and will remain open for one-two weeks. The process to select applicants will consist of a committee of 3-5 individuals consisting of AREE staff, NASA scientist or engineers, and/or NSERC faculty. The selection committee will use a scoring rubric to help them select qualified applicants. The selection process will occur within one week of the deadline for receiving applications. Notification letters will be electronically sent to selected applicants.

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A list of educators selected for the program will be published on the NSERC website. The proposed list would include their name, grade level and subject, and the curriculum-based activities they develop during the course of the program.

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.

The OMB approval number will be displayed on the application form.

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

None