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THE "MINE" PROJECT
(Minority Involvement in NASA Engineering)

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ABSTRACT

The Lewis Research Center of NASA has developed and successfully conducted a program for "Minority Involvement in NASA Engineering" (MINE Project) with Tennessee State University and Tuskegee Institute for the past year (1976-1977). The MINE Project is aimed at developing a wide variety of programs and activities that will be of benefit to both the Lewis Research Center and the universities. Specifically, the project calls for the Lewis Research Center to assemble on-going NASA university affairs programs aimed at benefitting the school, its faculty, and its student body. The schools receive grants to pursue research and technology projects that are relevant to NASA's missions. Upon request from the universities, the Lewis Research Center furnishes instructors and lecturers. In addition, the schools have use of surplus government equipment and access to NASA research facilities for certain projects. Both the faculty and students of the universities are eligible for summer employment through programs such as Summer Faculty Fellowship, Post Doctoral Residence Research Associateship, (Student) Aerospace Fellowship, Cooperative Education. The MINE Project is designed to establish a continuing active relationship of some 3 to 5 years between NASA and the two universities. Thus, the MINE Project will afford the Lewis Research Center with an opportunity to increase its recruitment of minority and women employees.

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THE "MINE" PROJECT

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INTRODUCTION

The Lewis Research Center of the National Aeronautics and Space Administration has developed and successfully conducted for many years a wide variety of joint programs and activities of mutual benefit with colleges and universities. Historically, most of these programs have involved the larger schools in the Midwest that possess faculty and curriculum strengths in the fields of science and engineering that are of interest to the Center. As a result, only a very small proportion of the talented, and potentially interested, minority youth of our society has been encouraged to enter the fields of science and engineering. The future strength of our Nation now requires that all persons of talent and interest be encouraged to enter these fields, regardless of race or sex.

In recognition of this need, it was decided in 1975, as a matter of management policy, that Lewis expand these many joint government-university programs to include selected minority schools. This was done by assembling the many types of joint activity and endeavor that have been proven successful with major universities into a single package of many elements from which a minority school may select those they consider potentially beneficial for mutual development with Lewis. In this way, we hope to make the challenges and opportunities of careers in science and engineering better known to minority youth and in the process to strengthen the schools in the fields of science and engineering. Such a package is Minority Involvement in NASA Engineering - the MINE project.

PROJECT STRUCTURE

The MINE project is designed to establish a continuing active relationship between Lewis and a participating minority school over an extended period of time (3 to 5 years with reevaluation at appropriate times). The project will proceed in such a way that Lewis will be interacting with the whole student body (freshman, sophomore, junior, and senior), the faculty, and the school administration, and will thus acquaint all of them with the broad scope of research and development work being conducted at the Center. This interaction will be accomplished by implementing appropriately selected elements of the total MINE project. The detailed structure and organization of the project for each participating school will be established jointly by Lewis management and school administrators.

PROJECT ELEMENTS

Presently, Lewis has a variety of ongoing university affairs programs and a number of undergraduate and graduate employment programs. These time-tested programs serve as elements

of the MINE project. The project elements, which are structured for the school, its faculty, and its student body, are as follows:

For the School

Research and technology grants. - In order to strengthen the educational capabilities of minority colleges and universities, Lewis will establish grants (of approx. $20,000 each) at the school to conduct worthwhile and pertinent research and technology projects. The requirements for these 1-year grants (which can be extended over several years) are that they must be relevant to NASA's missions, be concerned with timely problems, and have clearly discernible merit. Faculty members will serve as principal investigators and student participation will be strongly encouraged.

Areas of mutual interest for such grants will be determined by the school faculty and Lewis technical personnel in informal dialogues (by telephone, correspondence, or visits). Formal proposals will be submitted by the school once Lewis has expressed interest in the topic they select.

Instructors and guest lecturers. - When appropriate, Lewis will furnish visiting instructors, on a short-time basis, as experts in selected scientific disciplines at the request of the minority school. Also, guest lecturers on selected aerospace topics may be supplied by Lewis periodically. Lewis personnel may participate either as individuals or as a group.

For example, if a school is offering a course in aerodynamics and wishes to present the state of the art on that subject to its students, Lewis instructors could be made available to the school upon request to present current or timely subject matter. Similarly, the school might request a series of lectures from Lewis in the fields of power generation, energy conversion, and propulsion.

Surplus equipment transfers. - Arrangements can often be made by Lewis to transfer surplus government equipment to the school. Such equipment typically includes small vacuum systems (bell jars and vacuum pumps), instruments (gages, meters, and probes), furnaces, valves, and jet engine and rocket components. Equipment may also be loaned to the school if it has a NASA grant or contract.

Facility sharing for research projects. - By structuring certain research projects, it is possible for Lewis and the school to share their respective facilities (such as wind tunnels and test cells) for the conduct of the work. Experimental facilities can also be made available to the school if it holds a NASA grant or contract.

Depository library for Government Printing Office. - Lewis will assist the school in applying to be designated as a depository library for the Government Printing Office for receipt of government publications.

For the Faculty

Summer faculty fellowship. - The objectives of the summer faculty fellowship program, cosponsored by NASA and ASEE (American Society of Engineering Education), are (1) to further the professional knowledge of qualified engineering and science faculty members; (2) to stimulate an exchange of ideas between participants and NASA; (3) to enrich and refresh the research and teaching activities of participant institutions; and (4) to contribute to the

research objectives of the NASA center. A fellowship is awarded to a faculty member for research for two summers in a Lewis-university cooperative program consisting of a research project at the Center and courses, seminars, workshops, and lectures at a local university (Case Western Reserve University). The duration of the program is 10 weeks each summer with a stipend of $400 per week and a paid travel allowance.

Postdoctoral residence research associateship program. - The objectives of the resident research associateship program, which is administered for NASA by the National Research Council (NRC), are (1) to provide postdoctoral scientists and engineers of unusual promise and ability opportunities for research on problems largely of their own choice and (2) to contribute to the general research effort of the Federal laboratories. Associateship candidates are responsible for selecting a research program in line with their professional interest and related to one of the research areas of the NASA Center and for formulating the research plan. Investigations may be either theoretical or experimental. The stipend is from $15,000 to $18,000 annually, with a suitable travel grant. Final appointee selections are made by a NRC panel.

For the Student

National aerospace fellowship program. - The objective of the national aerospace fellowship program is to encourage members of minority groups and women to undertake professional careers in aerospace-related scientific and engineering fields, so that the supply of highly trained persons in these fields will be more representative of the population of the United States.

NASA training grants are awarded to universities, which are responsible for selecting the students who will participate. The student must have completed at least 2 years of work at the undergraduate level and must have a record of academic achievement that places him or her in the upper third of the class. The university or college receives $1000 per student. The student receive a $2500 stipend per year for school expenses and two summers of employment at a NASA Center at the prevailing rate for federal summer interns of approximately $6 per hour. Selection and assignment of students to the various Centers is currently handled by NASA Headquarters.

Cooperative education program. - The cooperative education program (Co-Op) leads to a bachelor's degree and allows students to alternate periods of study with on-the-job training in areas related to their college majors. The Co-Op program usually requires 5 years to complete and is a prime source of candidates for entry-level positions in the administrative, scientific, and engineering areas of NASA. Students in the program are paid at the GS-3 to GS-5 levels depending on their work experience and educational level.

Precooperative education program. - This program is an adjunct to the regular cooperative education program. Its aim is to encourage very talented high school female and minority students to undertake professional careers in science and engineering. The graduated high school students must have been accepted in an accredited engineering college or university. The students work at Lewis under a cooperative agreement with their university for the summer preceding their first year

of college. After completion of 1 year of full-time study toward a bachelor's degree, for which NASA pays the costs of education, the students enter the well-established NASA cooperative education program.

College work-study program. - The purpose of the college work-study program is to expand part-time employment opportunities for students, particularly those from low-income families who need earnings from part-time employment in order to attend a college or university. Under this program, which is funded by the Department of Health, Education, and Welfare (HEW), needy college students work a maximum of 15 hours per week during the school year and may work full-time in the summer and on holidays. This program is administered by the individual colleges receving grants from HEW. Students' work assignments may be in any area relating to their academic major. The students are paid $2 per hour, 80 percent of which is provided by HEW and 20 percent by the employer. While problems of distance preclude the use of this program for most schools, Lewis personnel will work with the schools who participate in the MINE project to determine if summer assignments can be made at Lewis.

Regular summer employment. - The Lewis summer employment program provides jobs for undergraduate and graduate students as well as short-time direct faculty hires. This element of the package offers financial assistance, an opportunity for enrichment of student career goals, and an introduction to the activities of the Center. Faculty members are usually employed in specialized research assignments that help to update their academic credentials. There are two primary summer undergraduate employment programs (subject to the availability of funds), the student trainee program and the federal summer intern program.

Student trainee program: Undergraduate students are eligible for positions at grade levels from GS-1 to GS-4. All applicants must take the Civil Service Commission's summer employment examination. Positions for graduate students from GS-5 to GS-12 are also available, primarily in engineering and to a lesser degree in administration. These students are hired in accordance with NASA's merit staffing program. Lewis will take steps to insure that potential candidates for the MINE project are properly informed and registered to complete for ratings under the summer employment examination and the Lewis merit staffing program.

Federal summer intern program: The purpose of the federal summer intern program is to provide summer employment and orientation to government activities for highly qualified college students from schools that have been selected by the U. S. Civil Service Commission. The students must have completed 2 or more years of college-level study, must be in the upper third of their class if an undergraduate student or in the upper half of their class if a graduate student, must be active in campus life, and must plan to return to school in the fall. Assignments are to nonclerical, career-related positions in grade levels from GS-4 to GS-11. No written examination is required to enter this program.

Summer institute programs. - There are several summer institute programs administered by other NASA Centers. Lewis is not directly involved in these programs but can direct the MINE project students into them. The summer institutes include biomedical engineering, computer applications, and public administration.

Tours of NASA - Tours of the Lewis Research Center and other NASA field centers can be arranged.

THE PROGRAM WITH TENNESSEE STATE UNIVERSITY AND TUSKEGEE INSTITUTE

After correspondence and discussions with the six black engineering schools - Howard University, North Carolina A. & T. State University, Prairie View A. & M. University, Southern University, Tennessee State University, and Tuskegee Institute - in April 1976, Tennessee State University and Tuskegee Institute were selected as the initial participants in the MINE project. Various elements of the project have subsequently been instituted at each of these schools; a summary of program activities between April 1976 and August 1977 is shown in the table.

It is too early to evaluate the success of a program such as this after just 1 year; however, the experiences that we have had to date with both schools, their faculties, and their students lead us to feel optimistic about the success of the MINE project in the years to come.

SUMMARY

The overall objective of the MINE project is to interest minority students in career opportunities with Lewis and at the same time benefit the participating college or university. As a result, it is hoped that a larger proportion of the talented and interested minority youth of our society will be encouraged to enter the fields of science and engineering. The basic idea of the MINE project is to use the many existing programs of government assistance to schools as a focus for relating to the needs and interests of selected minority schools.

This project has potential benefits beyond its direct merits. The existence of the project can aid participating schools in recruiting some of the better high school students. It also gives Lewis an opportunity to share both its current aerospace research and development activities and its rich history in the fields of propulsion and energy conversion with a section of our society who otherwise might have remained unaware.

SUMMARY OF ACTIVITIES IN MINE PROJECT (APRIL 1976 - AUGUST 1977)

Elements of project	Tennessee State University	Tuskegee Institute
For the school:		
Research and technology grants	----------	1 Grant
Instructors and guest lecturers	1 Guest lecturer	----------
Surplus equipment transfers	1 Vacuum system	1 Vacuum system
Facility sharing for research projects	----------	----------
Depository library for Government Printing Office	Established in 1972	Established in 1907
For the faculty:		
Summer faculty fellowship	----------	(1 Professor)*
Postdoctoral resident research associateship program	----------	----------
For the student:		
National aerospace fellowship program	4 Male students	1 Male and 3 female students
Cooperative education program	----------	1 Student
Precooperative education program	(2 Students)*	(2 Students)*
College work-study program	----------	----------
Regular summer employment:	----------	----------
Student trainee program	----------	----------
Federal summer intern program	----------	----------
Summer institute programs	----------	----------
Tours of NASA	1 Tour	1 Tour

*(Tentative Plans)