

FIRST QUARTERLY PROGRESS REPORT  
ON THREE SPECIAL EXPERIMENTAL PROJECTS  
IN TECHNOLOGY UTILIZATION  
April 1, 1967 -- June 30, 1967

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IN TECHNOLOGY UTILIZATION

Submitted by  
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## ABSTRACT

North Carolina Science and Technology Research Center, Research Triangle Park, North Carolina.

FIRST QUARTERLY PROGRESS REPORT ON THREE SPECIAL EXPERIMENTAL PROJECTS IN TECHNOLOGY UTILIZATION, APRIL 1, 1967--June 30, 1967.

Contract NSR 34-007-005

During this quarter, the Center began preliminary planning to conduct a pilot project measuring the benefits that may have accrued to industry clients and the State of North Carolina from the STRC's operation of a Regional Dissemination Center for new technology. Interviews with participating firms will begin during the coming quarter. In the second project, the Center's applications engineers evaluated titles of master's theses from N. C. State University to determine if they contain technology potentially useful for industry. During the coming quarter, a committee of consultants will further screen the selected titles plus others the engineers choose from Duke University and the University of North Carolina at Chapel Hill. The consultants also will ascertain if the Ph.D. dissertations from the three Research Triangle universities have received adequate dissemination. In the third project, two staff members carried out pre-testing of plans to furnish economical computer searches to qualified students undertaking thesis and dissertation research at the state's universities and colleges. During the coming quarter, letters with material publicizing the new service will be mailed to college departmental heads urging attendance by them and students at one of several regional briefings.

C O N T E N T S  
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I.	INTRODUCTION - - - - -	1
II.	EVALUATION OF BENEFITS TO INDUSTRY - - - - -	2
III.	MASTER'S THESES EVALUATION - - - - -	3
IV.	GRADUATE STUDENT THESIS SEARCH PROJECT - - - - -	4

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# NORTH CAROLINA SCIENCE AND TECHNOLOGY RESEARCH CENTER

## FIRST QUARTERLY PROGRESS REPORT

### I. INTRODUCTION

This is the First Quarterly Progress Report to be submitted to the Technology Utilization Division of the National Aeronautics and Space Administration under Contract NSR 34-007-005. The contract specifies that the North Carolina Science and Technology Research Center shall undertake the following three special projects:

1. ...Conduct a pilot project to measure the benefits which may have accrued to industry participants and to the State of North Carolina from the Contractor's operation of a Regional Dissemination Center.
2. ... Study and evaluate the potential value and possibility of expanding its information base through a review of the abstracts of theses completed by candidates for the master of science degree at the three Research Triangle Universities in certain specified fields.
3. ...Provide information services to selected graduate students in a project to study and analyze the effectiveness and cost of such provision.

In compliance with the contract, the following sections separately treat each of the projects.

## II. EVALUATION OF BENEFITS TO INDUSTRY

Dr. Edward W. Erickson, assistant professor of economics at North Carolina State University at Raleigh, has been employed by this center to conduct the pilot project measuring the benefits that may have accrued to industry clients and to the State of North Carolina from STRC's operation of a regional dissemination center for new technology.

Dr. Erickson and STRC Director P. J. Chenery have divided this investigation into four parts. Stage I is a review of services provided to participating companies. Stage II is composed of two subparts: A, a selection of a number of cases of technology transfer, and B, a study in depth of those selected cases which survive screening for applicability.

Stage III overlaps with the second part of Stage II and involves identification of the alternative routes which information may follow from research report to industrial application. Stage IV attempts to measure the economic benefits attributable to the use of new technology and to determine whether frequency of use or magnitude of benefit is related to transfer route.

### Plans for the coming quarter

During the quarter, a well-structured interview format will be developed to make best use of the limited time clients can be expected to make available for interviews. The schedule of questions is being developed as Stages I and II-A are completed. The interview format will be completed and ready for use with clients by August 1. The results of the first trials may suggest necessary changes.

### III. MASTER'S THESES EVALUATION

The purpose of this project is to determine if potentially valuable technology is contained in the unpublished theses completed by candidates for M.S. degrees in engineering and related scientific and technical fields. Additionally, an effort will be made to ascertain if Ph.D. dissertations have received adequate dissemination.

During June, a list of titles was compiled of all masters theses and doctoral dissertations written at North Carolina State University from 1915 through 1967 in fields which might contain technology suitable for commercialization. Two copies of this list, containing approximately 1,700 titles, have been given to STRC applications engineers for selection of promising titles.

#### Plans for the coming quarter

Abstracts of the titles selected by the engineers will be obtained and subjected to a further screening process during this quarter. The criteria which applications engineers will employ in reviewing titles and abstracts are: Do the documents contain new analytical procedures, new or novel hardware or apparatus, or significant research results for commercialization.

Potentially significant technology found in the selected abstracts will be noted and those portions of the complete documents will then be reproduced and assembled for review by a committee of consultants.

Simultaneously, an effort will be made during the coming quarter to determine whether the significant results of the Ph.D. dissertations have received adequate dissemination. Manual review of Chemical Abstracts and searches by author of the NASA file will be utilized. If the doctoral dissertations are found to be adequately covered in the literature, they will be excluded from the consultant's review. If not, it is anticipated that they will be reviewed at the same time as the master's theses.

During July, efforts will be made to secure the services of the group of consultants. Materials for their review will be ready about September 1.

Also during July, work will be completed on securing similar lists of theses and dissertations from the University of North Carolina at Chapel Hill and Duke University for identical evaluation and treatment.

Miss Becky Walker, full-time STRC employee and graduate of Meredith College in Raleigh, is spending about half her time in gathering the list of titles. Mr. Jerry Durham, a recent graduate of UNC at Chapel Hill, has been employed temporarily on a full-time basis for the same work.

#### IV. GRADUATE STUDENT THESIS SEARCH PROJECT

This project aims to acquaint graduate students, as future business and industrial leaders, with the breadth, depth and ease of retrieval of the computerized NASA information system by providing them an inexpensive search of information pertaining to their thesis or dissertation research.

To ascertain the best manner of processing students who avail themselves of the STRC graduate service, Dr. F. O. Smetana, assistant director for operations, and Applications Engineer A. P. Denmark, decided to pre-test their plans with a representative student.

They chose Mr. Stanley E. Dunn, a doctoral student in the Department of Mechanical and Aerospace Engineering at North Carolina State University. His search topic was "Selected Modern Developments in Hydrodynamics," with emphasis on supercavitating hydrofoils and drag reduction through boundary layer injection.



Dr. Smetana and Mr. Denmark discovered through their work with Mr. Dunn that the suggestion students write their own search programs with assistance from STRC engineers needs to be modified to have the engineers write the search programs. This action is necessary because of the many terms used and the intersections desired.

Mr. Dunn's search produced 429 hits, with an estimate that approximately 300 were directly pertinent. He has selected 48 abstracts for evaluation. Nine of those were not available on microfiche and were ordered; one is available as hard copy. Mr. Dunn will review the microfiche documents to decide which he desires reproduced.

The pre-testing with this student has demonstrated the need to work closely with the degree candidates to provide the guidance necessary for favorable and efficient service.

#### Plans for the coming quarter

Dr. Smetana and Mr. Denmark plan during this quarter to repeat the pre-testing with five other students, mostly from academic disciplines other than engineering, to determine how far individual student guidance must extend to provide satisfactory service, and to eliminate any inefficiencies in record keeping and data handling procedures.

The students selected for further testing will come from the three Research Triangle universities expected to furnish the most participants: two from Duke, two from UNC at Chapel Hill and one more from N. C. State.

Several forms have been designed to facilitate record keeping on this project.

An announcement of the project suitable for posting on university bulletin boards will be prepared and printed along with a cover letter describing the project in detail to departmental chairmen and faculty members.

The letter will suggest that interested faculty and students attend one of several regional briefings to describe the program. At this session conducted by STRC personnel, instruction booklets will be distributed and the students asked to complete a form describing their research and requesting an appointment for planning the search. The general announcements to the universities will be mailed about September 1, and the first of the briefings will be held about September 20.