Campus and consortium in an era of large-scale research: An historical study of the Virginia Associated Research Center, 1962-1967

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Campus and consortium in an era of large scale research: An historical study of the Virginia Associated Research Center, 1962–1967

Ward, Elizabeth Buchanan, Ed.D.

The College of William and Mary, 1993

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A Dissertation
Presented to
The Faculty of the School of Education
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In Partial Fulfillment
Of the Requirements for the Degree
Doctor of Education

by
Elizabeth Buchanan Ward
April 1993

by

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TABLE OF CONTENTS

ACKNOWLEDGEMENTS ........................................... v
LIST OF TABLES ............................................ vii
LIST OF ABBREVIATIONS ................................... viii
ABSTRACT ................................................. ix
PROLOGUE .................................................. 2

Chapter

I. INTRODUCTION ............................................. 7
II. REVIEW OF THE LITERATURE ............................... 21
III. METHODOLOGY .......................................... 37
IV. RESULTS OF THE STUDY ................................... 49
    PART I. A NARRATIVE .................................. 50
    PART II. CONSORTIUM ANALYSIS ......................... 91
V. CONCLUSIONS ............................................. 129

EPILOGUE ..................................................... 167
APPENDIX A. TABLES ....................................... 172
APPENDIX B. ORIGINAL VARC PROSPECTUS ................. 176
APPENDIX C. FLOYD L. THOMPSON, SPEECH ................. 235
APPENDIX D. VARC REORGANIZATION ......................... 244
APPENDIX E. NEWS ITEMS RELATED TO VARC ............... 252
APPENDIX F. LETTERS ...................................... 265
APPENDIX G. UVA PROPOSAL, CIRCA 1961 ................... 284

iii
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LIST OF TABLES

<table>
<thead>
<tr>
<th>Table</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. Archival Documents</td>
<td>173</td>
</tr>
<tr>
<td>II. Interviewees for the Study</td>
<td>174</td>
</tr>
<tr>
<td>III. Quantitative Interviewee Responses</td>
<td>175</td>
</tr>
</tbody>
</table>
LIST OF ABBREVIATIONS

AAAS  American Association for the Advancement of Science
AAUP  American Association of University Professors
AEC   Atomic Energy Commission
CEBAF Continuous Electron Beam Accelerator Facility
DOE   Department of Energy
FY    Fiscal Year (for United States Government)
LAFB  Langley Air Force Base
LRC   Langley Research Center
NASA  National Aeronautics and Space Administration
NSF   National Science Foundation
SCHEV State Council for Higher Education in Virginia
SREL  Space Radiation Effects Laboratory
SURA  Southeastern Universities Research Association
URA   Universities Research Association
UVA   University of Virginia
VARC  Virginia Associated Research Center
VMI   Virginia Military Institute
VPI   Virginia Polytechnic Institute
CAMPUS AND CONSORTIUM IN AN ERA OF LARGE SCALE RESEARCH:
AN HISTORICAL ANALYSIS OF
THE VIRGINIA ASSOCIATED RESEARCH CENTER, 1962-1967

ABSTRACT

A large agency of the Federal Government, three public institutions of higher learning, and two agents of State Government in the Commonwealth of Virginia launched a federally funded research and education consortium in 1962. The Virginia Associated Research Center (VARC) promised great success. The University of Virginia, Virginia Polytechnic Institute, and The College of William and Mary joined forces to provide the National Aeronautics and Space Administration’s Langley Research Center with a scientific research base and a graduate education program. The Commonwealth initially provided enthusiastic support from the Governor’s Office and from the State Council for Higher Education.

The three colleges agreed to cooperatively manage and operate the NASA Space Radiation Effects Laboratory on the Virginia Lower Peninsula. NASA funded the costs of operating the laboratory, gave the colleges research time for experiments and provided the colleges with large multidisciplinary grants. In return, the colleges were to set up graduate education programs for NASA employees. These graduate programs were to grant degrees from the respective institutions for course work taken at the VARC site on the Peninsula. The research function of the consortium proved to be more productive than the education function.
Certain criteria for successful and unsuccessful consortia were ascertained from
the literature. VARC’s characteristics were analyzed according to these specific
criteria. The three institutions could not agree on how to operate the facility.
Inherently weak governance structures in the consortium led to the failure of the
venture; after only five years, the consortium dissolved. The Governor of Virginia
placed the Center under the auspices of the college nearest the Peninsula, The College
of William and Mary. Though unsuccessful as a consortium, VARC became a means
to achievement for the three colleges. Each of the three gained stronger, more
reputable physics departments and two of the institutions achieved modern university
status. A qualitative analysis emerges as the consortium’s operation and
characteristics unfold through oral history. The study details circumstances which led
to VARC’s demise and simultaneously describes a key transitional period for The
College of William and Mary in its three hundred year history.

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PROLOGUE

In 1960, three years after the launch of the Soviet Sputnik, the National Aeronautics and Space Administration (NASA), under the direction of Dr. Floyd L. Thompson at Langley Air Force Base in Hampton, Virginia, proposed to build a Space Radiation Effects Laboratory (SREL) which would house the largest particle accelerator in the Southeastern United States. NASA needed the accelerator to test the effects of space radiation on equipment before actually sending the equipment into orbit. Thompson tried diligently to encourage the development of a graduate science education center around the SREL facility and thus enlisted the support of several influential leaders, both in government and in education.

A visionary plan was conceived in the form of the Virginia Associated Research Center (VARC). William H. McFarlane, director of the Virginia State Council for Higher Education and Governor Albertis S. Harrison, Jr. successfully prompted the 1962 Virginia General Assembly to authorize the formation of VARC as a cooperative effort of the College of William and Mary, the Virginia Polytechnic Institute and the University of Virginia.¹

¹Virginia Polytechnic Institute was not given the name Virginia Polytechnic Institute and State University until July, 1970. In Virginia, VPI also goes by Tech and Virginia Tech. See D. Lyle Kinnear, The First 100 Years: A History of Virginia
The colleges were to manage and operate the SREL facility in exchange for being able to use the laboratory for some of their own physics experiments. The three college presidents agreed to participate in the venture, each not wanting to miss out on something important, nor wanting the other to gain some advantage. Thompson, Harrison, McFarlane and others hoped that the center would soon provide graduate physics and engineering education for NASA employees and Tidewater residents. The vision for some included VARC's ascent to an "MIT south of the Mason-Dixon line."

Newly elected and riding high on a campaign platform of improving education and business and industrial development in the Commonwealth, Governor Albertis S. Harrison, Jr. wholeheartedly supported the joint venture of VARC and SREL. Near the end of his four-year term in office, Gov. Harrison was invited to speak at VARC/SREL's formal dedication ceremonies in December, 1965. An excerpt

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2John E. Duberg, former Associate Director of NASA, interview by author, December, 1992, tape recording, Newport News, VA. See also Myrtle Barnes, Newport News Times-Herald, "On VARC: Its Up to Virginia," Special Investigative Report Series, 4/9/68. Ms. Barnes quotes NASA Director Floyd Thompson: "Comparison of the program for Langley employees has to be with the best there is in the nation...it's got to equal M.I.T., California, Michigan State and other leaders." Article found at NASA-LRC, Department of Correspondence and Records Management, LAFB, Hampton, VA.

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from his remarks that day follow:

We have made a great many new beginnings in Virginia in the last four years, some of which reflect in a small way to the Governor's credit. But I have said many times, and I say again, that the Virginia Associated Research Center will prove to be one of the brightest stars in Virginia's crown during my term in office...It will become a mark of distinction to be able to say, however remote the connection may be, 'I am associated with the VARC complex.' I have no hesitation in saying, although the connection is equally remote, that the present Governor of Virginia will be among their number.³

A few years after the original group formed, the Medical College of Virginia joined the VARC consortium (1966). Space radiation effects research progressed according to NASA's satisfaction; however, the large graduate science and engineering center function that the visionaries had imagined went unrealized. In 1967, in response to various factors, Governor Mills E. Godwin, Jr. reorganized VARC and designated the center as an "integral campus of the College of William and Mary." At Thompson's suggestion, the name of the organization remained partially in tact, and under William and Mary's direction, it became The Virginia Associated Research Campus.

A mere 20 months after its auspicious dedication ceremony, something had changed the VARC agenda. The meager participation of graduate science students at VARC, under

³Albertis S. Harrison, Jr. personal papers, Speech given at VARC/SREL Dedication, December 15, 1965, Special Collections, Virginia State Library Archives, Richmond, VA.
the direction of William and Mary, deteriorated to almost nothing. Soon after the reorganization, NASA curtailed its research at SREL and George Washington University contracted with Langley to provide the graduate engineering education that NASA had hoped would have come from VARC institutions. The other colleges, UVA, VPI, and MCV, withdrew their participation and eventually VARC proved to be a major disappointment. VARC became the brunt of jokes, known on the Virginia Peninsula not as a great science center, but as the off campus site for graduate courses in teacher education and for housing the William and Mary Special Programs office. In the 1980s, the VARC property was turned over to a new consortium of universities which included the original VARC institutions. The Southeastern Universities Research Association (SURA) was contracted to construct and manage a new particle accelerator for the U.S. Department of Energy, the Continuous Electron Beam Accelerator Facility, currently under construction on the former VARC/SREL site.

Some 30 years after the 1961 birth of the original VARC idea, in the fall of 1991, a group of graduate students of higher education in their doctoral seminar course with Professor James M. Yankovich at the College of William and Mary were confronted with the idea that joint ventures between colleges and universities rarely succeed. Dr. Yankovich said something to the effect that the consortium
idea is a good one, but in practice, consortia seldom accomplish anything significant. As an example, Professor Yankovich cited the VARC idea. He mentioned that although VARC had the enthusiastic support of a Virginia Governor, it did not live up to its reputed potential. When the graduate students questioned Dr. Yankovich on why VARC failed, he could not supply any concrete reasons.

A trip to the college library revealed that no history of VARC had been compiled and no written document existed that could explain VARC's alleged failure. The Special Collections section of the library held several reams of historically rich material which had been stored and catalogued, but never analyzed. Thus began this graduate student's quest to find out more about consortia and specifically why VARC never grew into its creator's image.
Chapter I
INTRODUCTION

Synopsis

*Webster's Encyclopedic Unabridged Dictionary* (1989) defines the word "consortium" (plural, "consortia") as "a combination of financial institutions, capitalists, etc. for carrying into effect some financial operation requiring large resources of capital" or "any association, partnership, or union." In business and industry new interest in consortia has sprung up over the past decade. The 1984 passage of the National Cooperative Research Act and a loosening of U.S. anti-trust laws have combined to help U.S. companies compete with Japan and Europe in the global marketplace. Following the lead of business and industrial research and development, government and higher education are currently experiencing a surge of R & D consortia growth as well.

During the past ten years, federal policy on funding research has begun to shift away from the independent researcher, grant-contract award system toward rewarding cross-disciplinary, team research systems. For instance, in the Spring of 1993, various scientists within and without of the National Institutes of Health argue over the present recommendation that A.I.D.S. (Acquired Immune Deficiency Syndrome) research be gathered together under one central
control center, with coordinated funding. Proponents of the coordination plan envision success similar to that of the World War II Manhattan Project. With costs spiraling and funds limited, experts agree that the government will soon decide to place the A.I.D.S. research groups under a more coordinated, centralized system.¹

In a variety of fields, both federal and state governments are now subsidizing consortia growth between higher education and business all over the country. Yet, the consortium movement extends well beyond the research and development arenas. In addition to scholarly authorities who extol the virtues of consortia, widely read, newsstand sources of information predict much of the same for all of higher education. For instance, the 1991 September issue of Scientific American devoted over 95% of its contents to the subject of computer networking and the information innovations destined to transform society as we know it, including higher education. Reporters for Time magazine (April 13, 1992, p. 55), also give a popular press version of the issue. In the cover-story article, "Campus of the Future", the authors state, "...there will be much more inter-college cooperation, as neighboring schools share

facilities and courses to avoid needless overlaps."

April and May 1992 issues of The Chronicle of Higher Education contain several articles describing consortium arrangements and many articles about the continued scrutiny of federally funded university research. Computer science periodicals (Byte, Computerworld, Electronics, and Electronic News) have run numerous consortia articles in the past several years. Science, Science News, Scientific American, and Nature, all well-respected science news media, have each printed consortia articles in the past two years.

As this study is written in 1993, two multi-billion dollar efforts at consortium-managed laboratories are under construction in the United States: the Super- Conducting Super-Collider in Texas and the Continuous Electron Beam Accelerator Facility in Virginia. Both laboratories are built, managed and operated by university consortia under contract with a federal agency. An era of interinstitutional cooperation has arrived and the phenomenon is quickly becoming more the norm than the exception.

At least one higher education executive had the foresight to predict this consortium wave as early as 1984. According to President Frank Vandiver of Texas A & M, in a statement which appeared in the August 24, 1984 edition of

\footnote{A. Blackman, J. Reid, and J. Willberth, "Campus of the Future," Time, April 13, 1992, 55.}
**Science:**

Consortiums may be the outline of what universities will become in the next century. Intellectually or geographically kindred campuses that are linked by agreements might be able to achieve a matrix organization that would provide wider research and educational opportunities to students and faculties while still preserving separate campus identities and loyalties.\(^3\)

Though it may seem that institutions everywhere have jumped onto the consortium bandwagon, the consortium movement is not without its skeptics or its critics. Time will tell how many of the newly formed consortia will survive. The partnerships require vigorous leadership, as well as time, planning and commitment from all of the members involved. Of the numerous attempts at consortia over the past several decades, many have failed. In contrast, some have not only survived, but have prospered. Many authorities agree that more research is needed on successful and failed consortia.

**Significance of the Study**

A clear call for interinstitutional cooperation among federally sponsored research universities emanates from various sectors of the federal government. In *Federally Funded Research: Decisions for a Decade*, the Office of Technology Assessment 1991 publication, human resources are described as "perhaps the most important component of the

research system." The report goes on to say that new models, both university and federal, are needed that feature a greater sharing of resources and people—"models that stress research in units rather than [in] academic departments." In addition, the report stresses the increasingly interdisciplinary nature of research and the need for Federal research agencies to "encourage alternative models of education-in-research featuring greater sharing of resources and people...through grant support." The study suggests that research in many fields of science and engineering is moving toward a more industrial model including "specialized responsibilities and sharing of infrastructure."

Referring to academe and the current method of federal research funding, the preamble to the "Report of the White House Science Council Panel on the Health of U.S. Colleges and Universities, 1986", says the time has come to question the viability of the present system of individual grants and contracts and develop some other paradigms.

...the strength and excellence of this higher education enterprise is at a transition point, and can no longer be taken for granted. At a time when ever greater demands are being made on our research universities they find themselves, after more than a decade of belt tightening and retrenchment, with aging facilities, obsolete equipment and growing shortages of both faculty and students in many important areas...What is most needed is a re-examination and restructuring of

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the relationships that have evolved among the federal government, the universities, and U.S. industries.  

In the OTA publication previously cited, the authors state the need for more and better data on the Federal research system which could become instrumental in decision-making for the 1990s. The VARC case study provides such data, plus it contributes to information on the contexts and characteristics of the researchers as described below.

The highest priority in data collection for research policy making in the 1990s is comparable data from all of the agencies to help Congress maintain a well-rounded view of federally sponsored research. Quantitative data will not suffice. Information on contexts in which research is performed, and characteristics of the performers individually and collectively, will provide clues to how the numbers can be interpreted and perhaps acted on.  

Barbara Holland, in a 1990 Association for the Study of Higher Education Annual Meeting paper describing nine federally funded research consortia, writes that "the organizational strategies appropriate to the design and operation of research consortia are not well documented or understood." There is indeed a dearth of information on the subject of federally funded research consortia. Emmert


"OTA, 39 and OTA footnote 121, 39.

"Barbara Holland, "The Decline of Competition: A Study of Cooperative Approaches to University Research Management, ASHE Annual Meeting Paper," (College Station, TX: Texas A&M University, 1990), 10."
and Crow (1989) comment: "[Our] findings indicate that continued research into the organizational dynamics of R & D and of university cooperation with industry and government is called for." This case study of the Virginia Associated Research Center makes a contribution to the knowledge base available on the phenomena of interinstitutional cooperation among the members of a federally sponsored research consortium. VARC was initially created to manage and operate a federally funded laboratory facility, which by definition made it a federal research consortium.

State and regional sources also call for more and better cooperation among colleges and universities. The Commonwealth of Virginia Commission on the University of the 21st Century publication, The Case for Change, speaks directly to the matter of cooperation.

We cannot place too much emphasis upon the importance of cooperation. Among colleges and universities, between the state-supported and the independent sectors, between two-year and four-year institutions, between higher and elementary-secondary education, between higher education and business, between higher education and government—all of these relationships should be improved and carefully nurtured to ensure that old barriers do not prevent Virginia from seizing new opportunities.9

Other pertinent recommendations contained in the Virginia

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plan for the 21st century are:

1. Reward changes in the form of...new criteria for assessment of board members, presidents, and senior staff based on their performance in cooperative efforts with other institutions for the common good.

2. Better use of available resources leading to...greater cooperation among institutions with regard to telecommunications, computers, and transfer functions.¹⁰

Virginia is not the only state encouraging cooperation, nor is intra-state cooperation the only form that is being solicited from leaders of higher education. Regional cooperation is becoming more important in this era of instant communication devices.

From a November 1991 conference, "Keeping the Promise: Access and Quality in a New Economic Era," which was sponsored by the Pew Higher Education Research Program and the Western Interstate Commission for Higher Education a key participant made the following observation: "The best response to the scarcity of resources is the consolidation of resources: the development of consortia, a better definition of institutional roles, and an improved transferability."¹¹ From the director of the commission, Richard W. Jonsen, comes this suggestion:

The time is ripe for regional cooperation and planning. In an age when all institutions cannot provide all services for all clients and when focus must be sharpened and missions made clearer, there is a new and

¹⁰ibid, p. 16 and 20.

exciting opportunity for regional resource sharing and cooperation...[it] is in the public interest because it saves dollars...and in the interest of higher education because more efficient use of tax dollars lends credibility to the enterprise...[this] is one strategy that will strengthen public trust.\textsuperscript{12}

Daniel Alpert, a well-known author in higher education circles, concludes in "Performance and Paralysis" (1985):

This article has argued the need for new maps for the future university, the design of which would call for interdisciplinary and interinstitutional networks...\textsuperscript{13}

This dissertation adds substance to the few existing higher education sources documenting the usefulness and characteristics of university research consortia. Though the existence of higher education consortia can be traced to the first half of the twentieth century, federal research consortia still lack adequate representation in the available literature. The study may have important implications for public policy discussions in today's rapidly changing global environment. At this time of retrenchment, limited resources, and knowledge explosions, the proposal that colleges and universities work together on research and development has re-surfaced. In the past, universities have been individual, autonomous entities partially because of geographic and communication barriers. Modern technologies have broken down these types of barriers


and cutting-edge developments rapidly disintegrate other walls between colleges and universities. As Frank Vandiver once guessed, consortia may be the significant form of innovation for higher education in the next century.

The early years of the Virginia Associated Research Center, VARC, pose a relevant and original case study of what is commonly regarded as a failed consortium. VARC's first five years, 1962 - 1967, constitute the beginning and the end of the consortium period of its twenty-five year life-span. After the consortium was dissolved by Virginia Governor Mills Godwin in August, 1967, the center became an off-campus structure of the College of William and Mary; retaining part of its name, it was called the Virginia Associated Research Campus. No written historical account exists of the events which led to Governor Godwin's executive order in the summer of 1967. In fact, the history of VARC as a consortium has yet to be well documented in any form. Though conventional wisdom would dictate that VARC failed in its original purpose, a thorough analysis of the entire venture reveals some areas of success. On the surface, people, resources, circumstances and events pointed VARC toward greatness. Obviously, something beneath the surface must have caused an abrupt detour that led to termination instead of a brilliant future.

This investigation attempts to explore both the surface and below surface events to determine exactly what happened
during those critical five years. As the iceberg that
gashed the hull of the Titanic appeared only partially
visible above the frigid waters of the Atlantic, so the true
reasons for VARC's decline may have been well concealed.
Combining personal interviews of key participants with the
rich resources of archival materials, the investigator will
go as far under the surface as possible. Some limitations
have already presented themselves. Several key participants
are either deceased or unwilling to talk about the venture.
Regardless of these limitations and because of the people
who are willing to speak out, the researcher is confident
that a truthful scenario can be presented.

Barriers to cooperation among the three higher
education institutions may not have been overcome in
practice, although in theory, each of the three presidents
agreed to cooperate. Excellent resources were in place and
at the Center's disposal. The Center's Director, the state
government, local businessmen, local government, and a
powerful Federal Agency all overtly and enthusiastically
supported the VARC dream. Could the problem have been with
the colleges themselves? Were the colleges unable to
forsake the traditions of institutional autonomy and
competition? Were the colleges battling for survival as
much as the fledgling VARC? Who actually led the
organization, its appointed director or the member
presidents? Could a small band of enthusiastic engineers,
administrators and politicians really expect the support of three strong-willed, charismatic college presidents who each steered the helm of his own ship, on his own unique course? Did VARC ever really stand a chance of moving from blueprints to reality? This dissertation attempts to answer these and other intriguing questions as the VARC story unravels in this case study.

**Hypothesis and Research Questions**

The researcher began the investigation with this hypothesis: The Virginia Associated Research Center (VARC 1962-1967) functioned for a time as a successful higher education consortium. Environmental forces, external to the consortium, rather than internal failure, caused the need for reorganization in the fall of 1967. Specific research questions, based on the characteristics of successful and failed consortia, were derived from the literature review.

The research questions can be divided into three broadly homologous groups. The first group deals with consensus and cooperation:

- Did the consortium leaders and cooperating institutions establish a consensus on the mission and purpose of VARC?

- Were cooperative efforts among the institutions participating in VARC real, not token?

- Did VARC have clear, concise goals?

- Did each member president or CEO support the VARC mission A. in theory and B. in practice?

- Were all member institutions equally represented in the governance of the organization and in practice, were
all members able to exert equivalent influence?

Was there community support for VARC and how was it manifested?

The second group of questions involves the operation of the consortium:

Was there open, two way communication among the institutions belonging to VARC?

Did the consortium leaders engage in systematic, future-oriented planning for the consortium?

During the period 1962-1967 when VARC functioned as a consortium, was there strong, effective leadership?

Was funding adequate to meet the goals of the mission?

Were the organizational structures of VARC adequate to carry out the mission?

The final set of questions attempts to discern how the consortium served the individual institutions:

Did each participating institution perceive the consortium as useful?

Was there a fear on the part of member institutions that VARC could grow to usurp their autonomy, identity and distinctive function?

Did each of the cooperating institutions develop a sense of gain and strength by participation in VARC?

Conclusions

Deducing from the predictions of the literature surveyed in the next chapter, the days of colleges and universities sailing as lone ships on a sea of change are about to come to an end. Rather, there may be a real need for the "ships" to band together into fleets. Leaders of institutions participating in cooperative ventures, and the
leaders of any consortium need to know where the rocky shoals are and how best to avoid them. Ideally, this case study will provide additional insight into consortium problem areas and having more thoroughly exposed them, suggest solutions and alternatives.

Ken Burns, producer of the critically acclaimed, Public Broadcasting System documentary, *The Civil War*, once said, "the great arrogance of the present is to forget the wisdom of the past." With this case study of the original VARC consortium, an area of ignorance has been replaced with a systematic, documented analysis. The vision among leaders in Virginia to form the consortium, the struggle to maintain it and finally, the courage to relinquish the idea and move to something else will no longer be left to speculations and imaginations. This dissertation reconstructs from reliable sources "the wisdom of the past."
Chapter II
REVIEW OF THE LITERATURE

Initially, this review examines three venues for consortia in the United States: Higher Education, Business and Industry, and the Federal Government. Next, the review presents four recurring themes of consortia found in current literature from the same three venues: the rationale for participation in consortia; an explanation of possible barriers to cooperation; and characteristics of both successful and failed consortia.

Higher Education Consortia. A definition found in Donn C. Neal’s Consortia and Interinstitutional Cooperation describes a "consortium" as the merger of two or more institutions in a semi-permanent organization, typically sponsored largely by financial contributions from its members, that employs a professional staff whose sole responsibility is to encourage and to facilitate cooperative activities between and among the members, and between them collectively and others.1

Authors in Neal’s book present a brief history of the higher education consortium movement in the United States. To summarize that history, as early as 1925, with the foundation of the Claremont Colleges, the idea of

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interinstitutional cooperation has been circulating through the American higher education community. Shortly after the foundation of the Claremont Colleges came the Atlanta University Center, developed in 1929.

Consortium growth was slow for the next two decades, but momentum picked up after WWII, especially during the 1960's, when the concept gained wider acceptance. In 1965, in response to higher education's "boom period" and desegregation laws, Title III funding from the federal government provided incentives for "institutional development through cooperation."² During the more recent period of higher education's development, a new surge of consortium growth can be attributed to retrenchment, lack of resources, knowledge explosions in many disciplines, and the computer revolution.

In 1987, according to Neal's sources, there were over 135 viable consortia in the American higher education system. One comprehensive directory exists for these organizations, published by the Council for Interinstitutional Leadership (CIL), "...the only national organization whose primary mission is advocating the cause of interinstitutional cooperation in American higher education.

Business and Industry Consortia. One popular definition of the consortium from the business literature states that a consortium is a "group of members that pool resources to undertake projects beyond their individual means." Since the National Cooperative Research Act was passed by Congress in 1984, over 140 cooperative ventures have registered with the U.S. Commerce Department's Office of Technology Policy. According to an article in the June 1990 issue of Byte magazine, over 70 of the 140 cooperative ventures are consortia. Using the above statistics, the growth rate of new business and industrial consortia is ten plus per year over the six year period, 1984 - 1990.

Federally funded research consortia. During the 1980's, research consortium relationships between the government, industry, and higher education have grown more numerous. "Logan and Stampen, in a 1985 survey of comprehensive colleges and universities, found 128

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5ibid., 79.

government-funded programs for business-university ventures." Government and business sources (Office of Technology Assessment, 1991; Botkins, Dimancescu, and Stata, 1984, Botkins and Dimancescu, 1988) speak of the need for increased university involvement in the product development side of research. The time lag between university research and subsequent product development has been well documented (Collins and Tillman, 1988). Many sources (Botkin and Dimancescu, 1984, 1986; Roy, 1986; Botkin, Dimancescu and Stata, 1982; Holland, 1990; Erkison and Baldwin, 1988; Kenny, 1988; OTA, 1991, and Elder, 1988.) agree that higher education needs to become a more prominent player in the nation’s economic development. These same sources suggest consortia and similar cooperative efforts as an answer to narrowing the gap between research and product development.

Rationale for Institutions Entering a Consortium

In Consortia and Interinstitutional Cooperation, Donn Neal and his associates present a variety of reasons for entering into consortium arrangements. To summarize Neal’s comments, a college or university may join a consortium when, "...an institution can achieve more, do something better, or reduce cost." Frederick Baus, in an essay

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7Holland, 9.

8Neal, 3.
called "The Third Party Role", gives more specific reasons...

1. to assist mobile student populations in moving from one institution to another in dense population areas with high concentrations of higher education institutions

2. to facilitate information processing (data bases, library services, telecommunications)

3. to enhance professional development services (for faculty and administration)

4. for joint purchasing power (quality control and cost reduction)\(^9\)

In a 1982 article which appeared in *The Journal of Higher Education*, Judith Glazer addresses the little studied phenomenon of graduate level consortia. Her general information tends to agree with the suggestions of Neal and Baus. Glazer goes on to speculate that with decreasing federal aid to graduate students in the form of fellowships or research grants, graduate programs may find it necessary to cooperate across school or institutional boundaries.\(^10\)

Her primary criterion for entering into a consortium is that the institutions benefit from the alliance:

...if those who are being served are offered incentives that are attractive enough, that is, in their self-interests, an inter-university consortium can be one useful option through which to gain resources, improve

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\(^9\)Baus, 27.

quality, and sustain institutional missions.\textsuperscript{11}

As described in several sources (Holland, 1990; Botkin and Dimancescu, 1986; Emmert and Crow, 1989; OTA, 1991; and Elder, 1988), university research facilities may need to cooperate with both government and industry in consortial arrangements in order to access new equipment and qualified research personnel.

Universities, on the other hand, are confronted with the realities of modern research. No longer can the single scientist in a laboratory of boiling beakers follow a viable research agenda. Scientific and engineering research has become an organizational enterprise typically requiring teams of researchers and batteries of high technology, high-priced laboratory equipment...University-industry partnerships offer one approach to helping defray part of the high costs of large-scale research.\textsuperscript{12}

Though the preceding comments refer to higher education institutions, the same general principles were found in a survey of recent business and industrial literature on consortia. For example, U. S. business and industry find themselves embroiled in a contest for survival in the global market place. To aggressively compete with Japanese and European businesses, officials in U.S. companies rush to form alliances with each other and with foreign companies. "The U.S. is forming consortia to try to neutralize Japan's threat to monopolize, dominate, and control the supply and

\textsuperscript{11}ibid., 192.

\textsuperscript{12}Emmert and Crow, 408-409.
prices of much of its essential technology.\textsuperscript{13}

**Barriers to Cooperation**

Drawing from multiple sources of literature in higher education (Pritzen, 1988; Neal, 1988; Miller and Schuster, 1989; Rosovsky, 1990; Bok, 1986 and 1990; and others included in the bibliography), a list of possible barriers to cooperation might include:

1. Traditional institutional autonomy.
2. High degree of decentralization in governance.
3. Segmented, fragmented nature of academe, i.e. departmentalization.
4. Highly competitive nature of higher education for prestige, funds, students, faculty, etc.
5. Unwillingness to take risks--tradition.
6. Resistance to change--tradition.
7. Progress is slow, change is incremental.
8. Cooperative planning takes more time.
9. Faculty autonomy, allegiance to discipline.
10. Turf battles or turf claims.
11. Geographic barriers.
12. Funding problems, i.e., not enough.

Glazer (1982) says there have been no empirical studies to determine whether interinstitutional barriers can be

\textsuperscript{13}Barron, 276.
overcome when prestigious colleges attempt to cooperate with less prestigious institutions in graduate education. This literature review has not found any sources to dispute this 1982 contention.

Baus gives a concise statement that summarizes the reasons an institution may not want to cooperate with other institutions:

If the possibility exists, real or perceived, that an institution acting alone can exceed or expand its limits to seize an opportunity or to resolve a problem, then the consortium is not a 'live' option.¹⁴

Conversely, if colleges and universities can perceive a gain for their individual institutions by participating in a consortium, then they may overcome the various barriers to cooperation and decide to enter the arrangement. Many colleges and universities do just that, as evidenced by the more than 140 higher education consortia listed in the 1991 CIL Directory.

In business and industry, barriers resemble those found in the higher education environment. For example, in a recent article for the Harvard Business Review, Fumio Kodama states that the traditional methods of relying on "breakthrough" research strategy have continued to hamper the more efficient method of "technology fusion."

Regardless of whether the R & D is conducted by a single

¹⁴Baus, 26.
company or as part of a joint venture, tradition impedes cooperation. In the traditional method, basic researchers make discoveries, then hand off the results to a separate product development staff—what Kodama calls a wasteful and time consuming process. In the technology fusion method, all players cooperate simultaneously to achieve a marketable product in a more timely, efficient process.\textsuperscript{15}

Business and industry experience a high degree of competition. According to Terry R. Turner, a program manager of the new SEMATECH consortium in Austin, Texas, "Our very competitive nature has almost put us at a disadvantage relative to some of our international competition."\textsuperscript{16} A patent lawyer, writing an editorial piece for \textit{Computerworld}, has this to say about the subject. "Americans, unlike the risk-aversive Japanese, like to operate on their own and fight, rather than cooperate with their competition. This ...explains why Sematech and other consortia for joint technology development have been largely unsuccessful."\textsuperscript{17}

Successful industrial based consortia require


\textsuperscript{17}Alan H. Melnicoe, "These alliances aren't forever," \textit{Computerworld}, March 2, 1992, Vol 26, No. 9, 33.
flexibility, real cooperation from participants, and autonomy from parent companies. Each of these requirements are impeded by institutional claims to turf, company loyalty, and a fierce desire to be "king of the hill." Nevertheless, as demonstrated earlier with the numbers of new consortium ventures registered with the Department of Commerce, these barriers can be overcome. Characteristics of Successful Consortia

Once a consortium is formed, how is success defined? Several authors have attempted to describe an effective consortium. Again drawing from Frederick Baus, consortia are effective to the degree that they:

1. Enhance programs and objectives of their member institutions, or provide solutions to problems encountered by these institutions.

2. Establish a consensus among institutional leaders and participants.

3. Develop a sense of gain and strength on the part of the collaborating institutions.

4. Secure from the members real cooperation, not just "tokenism." In addition, Baus says it may be imperative that a consortium "keeps the missions of its respective constituencies and the validity of interdependence uppermost

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19 Baus, 26.
in its consideration—even relegating [the consortium itself] to a lesser priority.\textsuperscript{20}

Judith Glazer describes an ideal consortium as having four requisites:

...academic complementarity, joint long-range planning, a willingness to take risks, and a central budget. Beyond that, it will need at least one individual to spearhead activities, a strong fund-raising component, and sufficient esprit de corps to overcome institutional rivalry in a climate of scarcity.\textsuperscript{21}

Mark Poland, in a 1986 unpublished doctoral dissertation from the College of William and Mary in Virginia, lists six traits in a summary of the attributes of effective voluntary consortia.

1. Clear, concise goals.
2. Open, two-way communication.
3. Has the support of member presidents.
4. Engages in incremental planning.
5. Strong, effective leadership.
6. Perceived as useful to all members.\textsuperscript{22}

The literature consulted in a review of business and industrial consortium efforts agrees with the findings of

\textsuperscript{20}ibid., 30.

\textsuperscript{21}Glazer, 191-192.

each of these higher education analyses. For example, a 1992 *Business Week* article presented the keys to success for what is perhaps the most successful business partnership in the automotive industry, Ford and Mazda:

1. **Keep top management involved:** The boss must set the tone for the relationship. Otherwise middle managers will resist ceding partial control of a project to a partner.

2. **Meet often, and often informally:** Meetings should be at all levels and should include time for socializing. Trust can't be built solely around a boardroom table.

3. **Use a matchmaker:** A third party can mediate disputes, suggest new ways of approaching the partner, and offer an independent sounding board.

4. **Maintain your independence:** Independence helps both parties hone areas of expertise that made them desirable partners in the first place.

5. **Allow no 'sacrifice' deals:** Every project must be viable for each partner...senior management maintain overall balance.

6. **Appoint a monitor:** Someone must take primary responsibility for monitoring all aspects of the alliance.

7. **Anticipate cultural differences:** They may be corporate or national... stay flexible, place culturally sensitive executives in key posts.²³

This description of modes of operation in a highly successful business partnership bears obvious similarities to the higher education findings. Another example of a successful consortium outside higher education appears in an

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international science journal. Christopher Anderson, writing in the April 1992 issue of *Nature*, reiterates that a principle key to consortium success involves flexibility. "Industrial researchers say that such willingness to shift focus quickly to suit corporate sponsors proves that small consortia are staying flexible—a trick their big rivals have yet to learn."24

**Characteristics of Failed Consortia**

Michael J. Offerman, a graduate student in the Department of Leadership and Educational Policy Studies from Northern Illinois University, saw a need for more information on why many consortia are prematurely terminated. He consequently wrote his dissertation on factors leading to the termination of three adult continuing education consortia in Illinois. Offerman delineated nine major factors resulting in the premature termination of the consortia he studied:

1. Lack of a funding policy, i.e. not enough financial support, no public policy available to fund these types of consortia.
2. Lack of institutional commitment and support among members.
3. Lack of mission clarity.
4. Inadequate organizational structures.

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5. Ineffectiveness.
7. Institutionalization, i.e. the fear among members that the consortium would evolve into an important institution in its own right, usurping power and prestige from the members themselves.
8. Lack of community support.
9. Lack of member complementarity, i.e. members perception that one could stand to benefit more than another, inequalities in distribution of rewards.  

In sampling a wide variety of higher education and business literature, it is clear that Offerman's termination factors could well be applied to most other types of consortia. For example, Hesselberth (1991) has similar comments on failed consortia from the industrial perspective. Assuming funding is adequate, his most important considerations for success are strong, effective leadership; clear, specific goals; and whole-hearted commitment from all the participating consortia members. When any of these are lacking, Hesselberth predicts the enterprise is doomed to failure. As an additional example, the General Motors-Isuzu partnership constitutes a notable


failure in industrial consortia. According to Business Week, the partners were unwilling to make a total commitment, clinging fiercely to their individual sides of the road. "All too often, the partners duplicate resources rather than make them mesh. Neither company's management has shown a real commitment to working together."\textsuperscript{27}

**Summary**

After presenting a brief historical account of the evolution of consortia in America, this review of the literature has examined four major facets of the consortium movement. First, the review described the reasons organizations and institutions may consider entering consortium arrangements. Primary reasons include attractive incentives for self-improvement, availability of increased funds or resources, and increased strength to compete in the global marketplace. Next, the review detailed some of the barriers that block cooperative efforts. Fundamental barriers to cooperation include the traditions of autonomy and competition. In America, these traditions characterize both business and higher education.

Finally, the characteristics of both successful and failed consortia were examined. Successful consortia have the following attributes: effective leadership, mission


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consensus among participants, clear goals and objectives, real cooperative efforts from all members, enhancement of individual member institutions, effective planning and organizational structures, effective communication among members and consortium leaders, and some type of monitoring system to insure overall balance is achieved among members. Failed consortia have some or all of these characteristics: weak or ineffective leadership, lack of individual member commitment and support, lack of mission clarity, inadequate organizational structures, no system of checks and balances to insure that each member prospers, lack of community support, lack of adequate funds or lack of a funding policy, and finally, no safeguards to prevent the consortium from taking over member's individual identities or functions.

As this dissertation is completed, no new information has been found to add to or detract from the basic principles of consortium growth and management that have been delineated in this chapter. The next chapter will examine the qualitative methods used to study one alleged consortium failure in an effort to see how its development and characteristics parallel the development and characteristics of consortia that have been presented in the review of the literature.
CHAPTER III
METHODOLOGY

Introduction

As described in Chapter I, a defunct consortium, the Virginia Associated Research Center, served as a case study to analyze the characteristics of successful and failed consortia. Research questions were formulated using the most recent literature available on higher education consortia, business and industry consortia, and federal research consortia. The research hypothesis stated that VARC functioned for a time as a successful consortium, but because of external factors, had to be re-organized in order to remain viable. The methodology used to answer the research questions and check the hypothesis are outlined in this chapter.

Initially, the researcher looked for written accounts of VARC consortium history in the William and Mary Library Archives. Except for isolated newspaper reports, no coherent description of VARC history could be found. Next, the search led to other locations that contained historical records of VARC, including the NASA-Langley Research Center Department of Correspondence and Records Management in Hampton, the Virginia State Library Archives in Richmond, and the University of Virginia Library Archives. After sifting through reams of correspondence, committee meeting
minutes, news reports, budget and personnel reports, and myriad other documents, the researcher compiled a list of persons to interview in an attempt to develop an oral history.

**Research Hypothesis**

The Virginia Associated Research Center (VARC 1962-1967) functioned for a time as a successful higher education consortium. Environmental forces, external to the consortium, rather than internal failure, caused the need for reorganization in the fall of 1967.

**Research Questions**

1. Did the consortium leaders and cooperating institutions establish a consensus on the mission and purpose of VARC?

2. Were cooperative efforts among the institutions participating in VARC real, not token?

3. Did VARC have clear, concise goals?

4. Did each member president or CEO support the VARC mission A. in theory and B. in practice?

5. Were all member institutions equally represented in the governance of the organization and in practice, were all members able to exert equivalent influence?

6. Was there community support for VARC and how was it manifested?

7. Was there open, two way communication among the institutions belonging to VARC?

8. Did the consortium leaders engage in systematic, future-oriented planning for the consortium?

9. During the period 1962-1967 when VARC functioned as a consortium, was there strong, effective leadership?
10. Was funding adequate to meet the goals of the mission?
11. Were the organizational structures of VARC adequate to carry out the mission?
12. Did each participating institution perceive the consortium as useful?
13. Was there a fear on the part of member institutions that VARC could grow to usurp their autonomy, identity and distinctive function?
14. Did each of the cooperating institutions develop a sense of gain and strength by participation in VARC?

The Archival Documents

Records of VARC were located, copied, and collected from the following sources: The National Aeronautics and Space Administration Langley Research Center, Department of Correspondence and Records Management, located on Langley Air Force Base, Hampton, Virginia; The University of Virginia Library Archives and Special Collections, located in Alderman Library at the University of Virginia in Charlottesville, Virginia; The Virginia State Library Archives and Special Collections, located in Richmond, Virginia; and The College of William and Mary Library Archives and Special Collections, located in Swem Library at the College of William and Mary, Williamsburg, Virginia. Examples of the types of materials examined can be found in Table I of Appendix A.

The archival documents were initially used as background information providing a skeleton, or framework
from which to begin the study. The documents were also used as sources to determine potential subjects for interviews. The oral history compiled from the interviews serves as the bulk of this analysis. However, after the interviews were completed and transcribed, the historical documents were used to verify, to supplement, and where necessary, to contradict interview information.

Documents ranged from personal notes hand-written in ink on lined paper to formally transcribed correspondence on elaborate stationery. Glimpses into VARC's history were found in all of the various types of memorabilia, including newspaper articles from around the nation. Personal memoranda of former NASA staff members, former Governors, and college faculty and administrators provided candid and informative insights into VARC events. The memoranda of former NASA officials offered perspectives that were not covered in materials found at the other archival locations. In addition, NASA records contained numerous newspaper articles debating the wisdom of the VARC reorganization in September of 1967. Curiously, the researcher did not find these types of news articles on file at the other archival locations. The NASA files were the only source of the original VARC prospectus written first in 1962 and revised in 1963 by William McFarlane and Hartley Soule. A copy of the prospectus appears in its entirety in Appendix B.
Interviews

A total of seventeen persons were contacted for possible interviews, sixteen of which agreed to discuss VARC with the researcher either in person, over the phone or through the mail. Only one potential interviewee declined to participate. Interviewees were chosen based on the following criteria:

1. The interviewee played a major role in the early period of VARC history, 1960-1967.

2. The interviewee was able and willing to talk to the researcher about his involvement with VARC. (This criterion stems from the reality that some key VARC participants have died, at least one has become mentally incapacitated by old age or disease, and one politely refused to be interviewed.)

3. The interviewee was directly involved with some aspect of VARC, as an administrator, as a scientist, as a Virginia politician that influenced VARC developments, or as a State Council of Higher Education member during the consortium period of VARC's history.

For each of the interviewees, the consortium period of VARC history took place at least twenty-five years ago, and in some cases, over thirty years ago. As a courtesy and to prompt memory, the researcher sent a list of the questions to be considered by the interviewee in advance of the interview. All of the subjects interviewed for the project were males; several have passed their seventieth year, and at least three are in their eighties. Each of the subjects spoke with lucid and articulate memory of their involvement with VARC.
Eight of the interviews were conducted without face to face contact. Former Governor Godwin and former VARC Director, William H. McFarlane were interviewed over the telephone; McFarlane allowed the conversation to be tape recorded. Former Governor Harrison preferred to write his recollection of VARC in the form of a letter. Legislators Hunter B. Andrews and Herbert H. Bateman and former legislator, Joseph E. Blackburn were each contacted through the mail; these three men answered the interview questions by letter. Professors Kazuo Gotow and David Jenkins were contacted by telephone, and because of distance, were mailed an audio cassette tape and the list of interview questions. They each returned an audio cassette with a tape recorded answer session in response to the questions.

Of the seven face to face interviews, two of the interviewees preferred an unstructured format for the meeting, and in such cases, specific answers to the research questions had to be inferred based on the information obtained in the un-structured interview or from written information provided to the researcher after the interview took place. Specifically, Dr. Gugelot and Dr. Paschall preferred an unstructured format. Both men provided written correspondence to supplement the interview.

Interviewees can be categorized as either primary or secondary in nature. Operationally defined, a primary
The primary interviewees were:

Two of the three college presidents, Edgar F. Shannon of UVA, Davis Y. Paschall of William and Mary. (T. Marshall Hahn, the president of VPI during the time in question politely refused to be interviewed, citing time constraints as the major cause for refusal.)

The first acting director of VARC/SREL and physicist formerly associated with SREL research, UVA Physics Professor, Klaus Ziock.

The first permanent director of VARC and former director of the State Council of Higher Education in Virginia during the VARC early years, Professor Emeritus from George Mason University, William H. McFarlane.

The first permanent director of the SREL, UVA Physics Professor, Piet C. Gugelot.

The second permanent director of the SREL and William and Mary physics professor, Robert T. Siegel.

The former chairman of the VARC research and teaching group of physicists from VPI, Physics Professor Kazuo Gotow.

Two NASA executive administrators personally involved with VARC/SREL, Mr. T. Melvin Butler and Dr. John E. Duberg.

This group totals nine primary interviewees. These interviews serve as nine primary sources, or eye-witness accounts of the VARC history. Of the nine, only one, Dr. McFarlane of West Paris, Maine, was conducted via phone call because of distance. Also because of distance, one other, Dr. Gotow of Blacksburg, was conducted via tape recording.

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and delivered to the researcher by mail. The other seven primary interviews took place face to face with the researcher. All of the interviews were tape recorded and transcribed by the researcher, with the interviewee's permission, except in one case. Dr. Davis Y. Paschall did not consent to a formal interview and would not allow tape recording or formal note-taking. Instead, Dr. Paschall preferred to provide a brief written narrative and offered an impromptu meeting with the researcher. At said meeting, Dr. Paschall proceeded to give an oral account on selected aspects of the VARC story and his participation in it. Immediately after leaving this meeting, the researcher tried to recall the pertinent information and recorded it to the best of her ability.

As a follow-up on the initial round of nine primary interviews conducted with actual VARC participants, seven additional contacts were made to try and verify some of the controversial information gleaned from the primary interviewees. Operationally defined, the secondary interviewees were those who did not play a direct VARC role during the consortium period but were involved with VARC history either as government or university employees. Those interviewed in this category were:

One former State Council of Higher Education member during the time period in question, Richmond attorney and former State Legislator, Joseph E. Blackburn.

One former VARC researcher, VPI Physics Professor, David Jenkins. Dr. Jenkins came to VARC as part of the VPI research group in January 1967, just months after the joint venture was reorganized as a part of the William and Mary campus.

Two State Legislators during the VARC consortium period, State Senator Hunter B. Andrews and Congressman Herbert H. Bateman.

One former Public Relations Director for Virginia Polytechnic Institute and State University, and former reporter for the Richmond Times-Dispatch, Marshall Hahn’s biographer, Warren H. Strother.

The total number of secondary interviewees equals seven. All of the secondary interviewees responded by mail. In addition, Mills E. Godwin, Jr. and Warren Strother spoke with the researcher over the phone. Mr. Strother proved to be especially helpful in gathering written information on Marshall Hahn, the former VPI President who refused to be interviewed. Mr. Strother has been kind enough to allow the researcher to quote from his notes. The notes were prepared by Strother for his forthcoming biography of Marshall Hahn. The Strother notes are based on information obtained during interviews that Strother conducted with Hahn, Paschall, Blackburn and others who participated in VARC. The notes are also based on VARC information that Strother located in the VPI Archives. Strother provided copies of this information pertaining to VARC, as well as some pertinent
correspondence from Hahn during the time in question. Mr. Strother did confirm some controversial information obtained during the primary and secondary interviews. His information is based on actual conversations with the VARC participants and to his knowledge, the conversations were not confidential.

In total, the researcher compiled interview data from sixteen different sources. Most of the face to face, telephone, or tape recorded interviews took at least 90 minutes to complete, with the extremes ranging from two and one-half hours (Dr. Paschall) to twenty minutes (Dr. Jenkins). Those interviews which were tape recorded were then transcribed by the researcher. Only one interviewee, Dr. McFarlane, asked to see a copy of his interview transcript.²

Analysis

The VARC case study represents the historical method of analysis and serves strictly as a qualitative study of historical events. Interviews with eye-witness participants were taken as primary sources for the historical analysis. Each interviewee was able to add to or digress from the researcher's intended format, as the

²Note: Dr. McFarlane did not respond to his interview transcript up to two months after having received it. He did confirm receipt in writing.
interviewee felt most at ease to discuss his recollections of the VARC. With the single exception of Davis Paschall, all of the primary interviews followed a list of the prescribed questions which had been read by the interviewee prior to the interview. The questions were answered either directly or indirectly during the course of the discussion. Paschall's answers had to be inferred based on his written summary of VARC, his oral account, and parts of the Kale, Smith text *Davis Y. Paschall: A Study in Leadership.*³

A brief quantitative account of the interview questions and responses appears in TABLE III, Appendix A. Only the nine primary interviewees' responses were counted in this tally. Though some of the secondary interviewees' accounts were quite informative, these men were not as completely aware of the operations of VARC as the primary interviewees. Therefore, their interview responses do not appear in the chart. The secondary interviewee's comments appear in the results section of the study where the research questions are answered in detail.

A complete list of the interviewees and their institutional affiliations appears in Table II, Appendix A. The total content of the interview data was used to triangulate with archival records in an effort to compile an

accurate picture of VARC's consortium history. In addition, some interview data was used to triangulate with other interview data in order to present a complete oral history. For instance, a given incident of the VARC story should not be related from a single viewpoint. Rather, the comprehensive story of an event can be discovered by articulating multiple eye-witness perspectives. This articulation process has been attempted in all possible cases during the narrative and analysis sections which appear in Chapter IV.

The researcher qualitatively and quantitatively compiled data from the interviews, plus took information from the historical documents in order to answer the research questions and determine the validity of the hypothesis. As stated earlier, the primary sources for information were the interviews. Archival documents were examined initially to gain a scope of the VARC consortium. Later, after the interviews, archival documents were used to supplement, verify or contradict the interview data where needed. Notes appear throughout the text which cite interview sources and archival records.
CHAPTER IV

RESULTS OF THE STUDY

"We have a long way to go in this space race. We started late. But this is a new ocean, and I believe the United States must sail on it and be in a position second to none."

President John F. Kennedy, 1962

"When little NACA exploded into gigantic NASA the effect on the conservative, penny-pinching engineers who had been running Langley was so drastic that it was almost amusing. Men had to expand their vision a thousand fold overnight, and experts who had been pondering problems a hundred miles into space were now encouraged to visualize operations occurring two billion miles away.

A new breed of managers appeared, too, men alerted to the necessity for good public relations, so that where secrecy and hesitancy once prevailed, with NACA engineers terrified of even uttering a theory before it could be proved, the NASA men delighted in throwing up into the wind of publicity the wildest statements to titillate the general public. One such expert, former editor of a newspaper, studied the rosters of all the branches taken over by NASA and saw to his dismay that only a few of the practical engineers who had perfected the marvels of this age possessed doctorates, and he was quite blunt when he faced the management with his data:

There is no major agency in this nation with as few men with doctorates as NASA. It's a disgrace, and it places you at a severe disadvantage when you testify before Congress or in public. If I can issue a press release which says that Dr. Stanhope of NASA predicts this or that, it gets attention. If I have to rely on Claude C. Stanhope, who holds this or that position, and for God's sake, isn't even a professor, I get no hearing at all."

excerpt from the novel Space, by James A. Michener
PART I. A NARRATIVE
The Virginia Associated Research Center began as the brainchild of NASA-Langley administrators and engineers who were determined to find a way to provide doctoral degrees for their employees. In order to accomplish this feat, NASA proposed to build a Space Radiation Effects Laboratory which would help the local state colleges and universities attract stronger faculty, which would in turn strengthen the respective graduate programs in science and engineering and in the long term, provide NASA employees with a near-by location for acquiring their doctorates.

NASA men believed that the SREL would draw university faculty participation, elevate the status of science and engineering in the state higher education system, and as a side benefit, provide a necessary tool for conducting NASA's research projects on space radiation. NASA held high expectations and contributed large sums of money to fund the enterprise. The federal government also contributed a huge parcel of surplus land to the project—roughly 1,000 acres. The participating state institutions were to provide management for the operations of the facility and the faculty to teach the graduate science programs.

Events did not progress as NASA had hoped and planned. After struggling with the state higher education system and the participating colleges for almost ten years, NASA
ultimately withdrew from the laboratory and found a private institution, George Washington University, to come to the Langley site and offer graduate degrees. The story that unfolds here describes why the state higher education system could not provide what NASA needed.

First, the players in this story need an introduction. In alphabetical order by institutional affiliation they are:

**The College of William and Mary in Virginia. Williamsburg.**

- **Davis Y. Paschall, A. B., M. A.,** College of William and Mary, Ed. D. University of Virginia. President of the College, Emeritus, 1960-1971, former Virginia State Superintendent of Instruction, former Board of Visitors member for the College of William and Mary. Retired and living in Williamsburg.

- **Robert T. Siegel, B.S., M.S., D.Sc.,** Carnegie Institute of Technology. Walter F. C. Ferguson Professor of Physics, former Director of SREL. Currently acting as Professor of Physics at the College.

**Commonwealth of Virginia. Richmond.**

- **Albertis S. Harrison, Jr., L.L.B.,** University of Virginia, attorney, Governor 1962-1966, strong supporter of VARC idea and original mission, retired Justice for the Virginia State Supreme Court, living in Lawrenceville, Virginia.

- **Mills E. Godwin, Jr., A. B.,** College of William and Mary, L.L.B., University of Virginia, attorney, served as Governor 1966-1970 and again 1974-1978. The only governor in Virginia to have been elected twice to that office, once as a Democrat, once as a Republican. Retired and living in Chuckatuk, near Suffolk, Virginia.

- **Carter O. Lowence, A.B.** Roanoke College, Gubernatorial Administrative Assistant to several Virginia Governors, including Harrison and Godwin. Later became an executive vice-president at the College of William and Mary. Died, 1989.

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National Aeronautics and Space Administration, Langley Air Force Base Research Center (NASA, LRC). Hampton, Virginia.

T. Melvin Butler, B. S. Engineering, Virginia Polytechnic Institute, NASA Director of Administration. Trained as an industrial engineer, but always worked as an administrator for NASA. Retired from NASA, but currently serving as a member of the Hampton City Council.

John E. Duberg, B. S. Engineering, Manhattan College, M. S. Engineering, Virginia Polytechnic Institute, Ph.D. University of Illinois, Urbana. Assistant Technical Director, and former Associate Director for NASA, currently retired and living in Newport News.


Floyd L. Thompson, B.S. Aeronautical Engineering, University of Michigan. Honorary Doctorates from the College of William and Mary and University of Michigan. Chief of Research and Director of NASA Langley Research Center. Credited with the original idea for SREL/VARC partnership. Died in 1976.


University of Virginia. Charlottesville.

Piet C. Gugelot, Ph.D. University of Zurich, Professor
of Physics, came to Virginia from Europe as first Director of SREL, 1966. Later moved to Charlottesville to become Physics Professor at UVA. Currently living in Charlottesville.

Edgar F. Shannon, Jr., A.B. Washington and Lee, Ph.D. Oxford University, Rhodes Scholar, President Emeritus University of Virginia, Professor Emeritus, UVA. Retired and living in Charlottesville.

Klaus O. H. Ziock, Ph.D. Yale. Professor of Physics, came to Virginia to work with SREL, served as acting director of VARC/SREL until 1964. Continues to teach and do research at the University of Virginia in Charlottesville.

Virginia Polytechnic Institute and State University.
Blacksburg.

Kazuo P. Gotow, B. S., M. S., Tokyo, Ph. D., University of Rochester. Professor of Physics. Former research scientist at SREL, and VARC faculty member. Living in Blacksburg.

David A. Jenkins, B. S. Yale, M. S., Ph. D. University of California at Berkeley. Professor of Physics. Former research scientist at SREL, and VARC faculty member. Living in Blacksburg.

T. Marshall Hahn, B. S. University of Kentucky, Ph.D. Massachusetts Institute of Technology. VPI President Emeritus, currently working as the President and Chief Executive Officer for Georgia Pacific, Incorporated, Atlanta, Georgia.
Origins of the Consortium

Early in the 1960s, in the wake of Sputnik's successful launch, officials in the United States marshalled a campaign to win the space race. Chief among those in the quest were National Aeronautics and Space Administration (NASA) executives at the NASA-Langley Research Center (LRC) located on Langley Air Force Base bordering the city of Hampton, Virginia. While employees of the LRC regretted the loss of the mission control aspect of the manned spacecraft project to their NASA-Houston counterparts, the Director of NASA-Langley, Floyd L. Thompson prepared for other means of participating in the race for space exploration.

In the winter of 1960, Thompson's organization submitted plans for the construction of a Space Radiation Effects Laboratory (SREL) to the Federal Government in Washington as a Fiscal Year 1962 budget item. This news spread quickly both inside and outside Virginia. Soon several other states were lobbying in Congress for consideration as possible construction sites. Early in 1961 the Governor of North Carolina visited James E. Webb, Director of NASA Headquarters in Washington, D.C. with a proposal that the University of North Carolina and North Carolina State University be considered in the planning of
the new laboratory.\textsuperscript{1} In the Commonwealth, members of the University of Virginia faculty drafted a proposal to secure the operating contract for their institution. Letters to Governor Albertis Harrison during the same period indicate mounting concern over opposition in Congress from legislators in Texas, North Carolina and Illinois, all of whom were interested in acquiring this new aspect of the space program for their states.\textsuperscript{2}

The Congressional struggle to win the construction of the SREL facility was ultimately won by the Virginia Delegation and the NASA-Langley Research Center; formal budget approval came with Fiscal Year 1963. During the interim, several groups of Virginians began working toward how the facility might be used to their advantage. At least five Virginia colleges expressed an interest in the project, local business leaders and state legislators began to plan an industrial park to complement the laboratory, and NASA pursued their plan for meeting the educational needs of

\textsuperscript{1}James E. Webb. NASA Office of the Administrator. Washington, D.C., Memorandum to Floyd L. Thompson, Director, Langley Research Center, January 23, 1962. Document located at NASA Langley Research Center, Department of Correspondence and Records Management, Hampton, VA.

\textsuperscript{2}Edgar F. Shannon, Jr. Office of the President, University of Virginia, Charlottesville, VA letter to Governor Albertis S. Harrison, Jr., Richmond, VA, March 29, 1962. Document located in Governor Albertis S. Harrison's Papers, the State Archives of the Virginia State Library Special Collections Department, Richmond, VA.
Thompson and other NASA administrators saw a critical need for offering graduate level science and engineering courses close by or on the Langley site. This would prevent LRC employees from having to interrupt their jobs and family lives to travel across the country or to the only locations in the state that offered advanced degrees in engineering and physics at the time, UVA and VPI. These two state colleges had been offering extension courses at the LRC for a number of years; however, students still had to complete certain residency requirements by traveling to the respective campuses. Thompson decided that the SREL facility may be the stimulus he needed to implement a system of graduate instruction closer to the LRC home base.

Normally used as a tool by high energy physics researchers, the laboratory would help NASA simulate the effects of radiation in outer space. Scientists needed to know how the radiation would compromise materials, equipment, and living things in space where there is no protection from earth's atmosphere. But Thompson and his associates wanted more from SREL than its design as an applied research tool. NASA hoped that the cyclotron would attract the state colleges to participate in research programs of their own and offer graduate level science and engineering degrees for NASA employees at the SREL site.
Historical documents found at various locations throughout the Commonwealth indicate that the five Virginia colleges which expressed an interest in participating in the NASA project were the University of Virginia, Virginia Tech, the College of William and Mary, Old Dominion College, and Hampton Institute. By fall 1962, NASA had chosen only the three schools located north and west of the air base to participate, UVA, VPI, and William and Mary. Accounts of how this decision came about vary.

According to one source, Thompson and his assistants met with representatives of the closest State supported four-year institution, the College of William and Mary, and the Foundation Director of Colonial Williamsburg to discuss building the laboratory in Williamsburg. The representatives from William and Mary and Colonial Williamsburg felt that Williamsburg would not be the appropriate place to build the SREL. In the paraphrased words of Davis Y. Paschall, former William and Mary President, "I advised Thompson to seek out the Governor's assistance and advice on this new idea of his. William and Mary was not adequate, either in staff or facilities, to

3See Chapter III and Appendix A. Table I for a complete list of archival source locations. Correspondence from each of the five college presidents is located in Floyd Thompson’s files in the Department of Correspondence and Records Management, NASA-LRC, Langley Air Force Base, Hampton, VA.
handle such a large operation.""

Other memoirs present a different account. For example, former NASA administrator, T. Melvin Butler, recalls that Thompson first flew to Charlottesville and then to Blacksburg to discuss his plans with the UVA and the VPI presidents and the heads of their physics departments. Butler points out that NASA already had extension services with these two institutions and it seemed logical that Thompson would have contacted them first. Mr. Butler described the idea for a cooperative venture between the three colleges as having originated entirely within the mind of Mr. Thompson. Mr. Butler also described NASA's efforts to secure the support of the Commonwealth. He remembers talking with the State legislators and meeting with Governor Harrison in Richmond."

Former Technical Director to the NASA Assistant Director during the VARC years and later Associate Director, Dr. John E. Duberg, confirms Mr. Butler's claim of the origin of the idea for a cooperative function among state colleges. According to Duberg:

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"Davis Y. Paschall, private conversation with the Researcher, Williamsburg, VA, December, 1992.


"For corroboration with Duberg's and Butler's recollections, see also Floyd Thompson's transcript of his VARC-SREL Dedication Ceremony speech, delivered December 15, 1965. The transcript is

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The idea came about when the State of Virginia got interested in knowing why they had not been selected over Houston for the NASA manned spacecraft program. They were told it was because there was a paucity of education around the Langley Research Center and the idea was born that there needed to be more higher level educational activities. Of course, that would be the spirit of the time to increase educational facilities, so we had cleared it with Washington and Harry Byrd and a few other politicos, ... and the idea was then presented to Governor Harrison.

The first meeting we had with the State of Virginia was with Governor-elect Harrison, sitting up in the capital in a small private room they had set aside for him to prepare for his term in office. That is when we broached the idea with the state that they might be interested in one of our new facilities being built at the old BOMARC missile site, near Oyster Point in Newport News, [and] using that as a focal point for an educational program.\(^7\)

Yet another version of the story exists. A former Director of the State Council of Higher Education claims to have jointly authored, with a NASA representative, the proposal of a consortium of colleges to operate SREL. According to William McFarlane, the Director of the State Council of Higher Education in Virginia (SCHEV) during 1961, the SCHEV (re-established in 1958) had the responsibility to advise the Governor and the General Assembly on matters concerning higher education in the Commonwealth. When SCHEV members became aware of the idea that William and Mary had located in Floyd Thompson’s files, Department of Correspondence and Records Management, NASA-LRC, LAFB, Hampton, VA. A copy of the transcript appears in Appendix C.

\(^7\)John E. Duberg. Interview with the researcher, December, 1992.
been approached as a possible NASA contractor, they set about recommending that UVA and VPI be included as co-operators because of the established nature of their physics and engineering programs.

...William and Mary was just barely able to make it as an undergraduate college, [giving them exclusive possession of the NASA contract for SREL] just did not seem to fit my concept of what it meant to develop and coordinate higher education...

...some members of the council saw the laboratory as a major opportunity to promote and upgrade higher education. But they did not see it all focusing on William and Mary for two reasons: 1. It was not at that time prepared or staffed to take over such a big laboratory. On the other hand, UVA and VPI, both with major graduate schools...should be involved somehow in the laboratory. 2. To give it to one school at that time seemed like a very un-coordinated thing to do.8

McFarlane noted that Paschall was not then the chief executive officer of the College. William and Mary had been put under an umbrella system known as the "Colleges of William and Mary" that included not only the main campus at Williamsburg, but all of its branch campuses, ranging from Richard Bland College in Petersburg to Old Dominion College in Norfolk. The chief executive officer at the time of Thompson's inquiry would have been Vice Admiral Alvin D. Chandler, Chancellor of the "Colleges" system.9 It was not

8 William H. McFarlane. Interview with the researcher, January, 1993.

9 For corroboration of McFarlane's memoir, see also the Colleges of William and Mary System account in Wilford Kale and Harry L. Smith's Davis Y. Paschall: A Study in Leadership,
until later in 1962 that the umbrella system was dissolved and Paschall became the executive officer for the Williamsburg College.

By invitation from Floyd Thompson, McFarlane remembers visiting NASA-Langley in December of 1961 where he met Hartley Soule, a NASA engineer. Mr. Soule then visited Dr. McFarlane in Richmond and the two of them drafted the original prospectus of VARC as a higher education consortium of the three state institutions. In the prospectus, VARC was designed to meet all of NASAs original and future objectives for SREL. (A copy of the original prospectus appears in Appendix B of the dissertation.)

Also in that month before Governor Harrison took office, NASA forwarded a copy of a December 6, 1961 press release to Richmond. The press release indicated that controversy surrounding the consortium idea had already begun. To clear the air, NASA announced publicly its interest in constructing and operating a cyclotron for use in space research programs. The short statement to the press contained the following pertinent information:

As part of the necessary preliminary studies, NASA has participated in purely preliminary discussions with representatives of some of the educational institutions in Virginia to obtain their advice and recommendations for the effective operation of such a facility [as the

Official NASA records from Floyd Thompson's files outline the following significant dates. Important to note is that the meetings with the three colleges were less than three days apart and that the meeting with the SCHEV members took place within one month of the college visits.

**January, 1960.** NASA submitted SREL proposal to Congress as a Fiscal Year budget item. It was finally approved as a budget item in Fiscal Year, 1963.

**November 24, 1961** Visit to Langley by Vice Admiral Alvin D. Chandler, Dr. Davis Y. Paschall, Dr. Melvin A. Pittman, and Mr. James Robertson of William and Mary for preliminary discussion.

**November 27, 1961** Visit by Mr. Thompson, Dr. Duberg, Mr. Butler, and Mr. Hixon to the University of Virginia to meet with Dr. Jesse W. Beams and Dr. Lawrence Quarles.

Same Langley representatives met with Dr. Louis A. Pardue, Dr. Snyder H. Byrne, Dr. Stuart B. Row, and Dr. James A. Jacobs at Virginia Polytechnic Institute.

**December 28, 1961** Visit by State Council for Higher Education to Langley

**Staff** — Dr. William H. McFarlane, Director

   Mr. James Bailey, Assistant Director

**Council** — Joseph E. Blackburn

   Sol W. Rawls, Jr.

   J. Hoge Tyler, III

   Harry C. Wyatt

Also attending were the Presidents or their designated

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Progressive Development of the Consortium

Regardless of exactly how the idea for a joint venture between the three colleges originated, by 1962, one residual point was clear: the idea began to germinate in the minds of NASA administrators, the State Council members, the college presidents, the state government officials and the business and industry leaders on the Virginia Lower Peninsula. Each of these groups had their respective notions of what the SREL, a $13 million dollar federal laboratory facility, would mean to them.

By the spring of 1962, the Federal government was considering how much surplus land on the Peninsula it could donate to the NASA project. Area business and industry leaders actively solicited the help of their state representatives in acquiring some of the surplus federal land for the construction of a large research and industrial park. Numerous documents found at NASA-Langley and at the State Archives in Richmond indicate that the Peninsula Regional Development Authority pursued this research park

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1-Floyd Thompson's "Record of Significant VARC-SREL Dates." Document located in Floyd Thompson's papers, NASA Langley Research Center Department of Correspondence and Records Management, LAFB, Hampton, VA, November, 1992.
idea aggressively. The businessmen met with resistance from the colleges and though many hours and dollars went into various proposals, nothing much came of it until almost 25 years later.

Not wanting to miss out on a golden opportunity for growth and expansion of their physics departments, the three colleges all expressed a desire to cooperate with NASA and with each other in what became known as the Virginia Associated Research Center (VARC). The VARC would then contract with NASA to manage and operate the SREL and offer advanced degrees from the respective schools through faculty at the VARC site. In return for their efforts to manage the laboratory, NASA would give the schools and their physicists a much coveted one-half of the operating time on the machine, plus several million dollars worth of multidisciplinary research grants. NASA would retain the other half of the operating time and a priority status if a conflict over time on the machine arose.

In March 1962, the Virginia General Assembly gave

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legislative sanction to the Virginia Associated Research Center as an official project of the Commonwealth of Virginia. In May of that year Governor Albertis S. Harrison, Jr. approved the VARC agreement and NASA sought the acquisition of the Federal land needed for the project. Also in May of 1962, the United States House of Representatives approved the SREL as a part of the NASA budget for Fiscal Year 1963. Two months later, the United States Senate approved SREL’s addition to NASA’s budget.

In the month between the House and Senate budget approvals, on July 1, 1962, three Virginia colleges officially signed the contract which entered them into the joint agreement know as VARC. The complete agreement appears in the VARC Prospectus contained in Appendix B of this dissertation, however; some of the salient points of the agreement follow here:

WHEREAS, the purpose of such joint venture will be threefold:

(a) To develop procedures and methods whereby the College of William and Mary in Virginia, the University of Virginia and Virginia Polytechnic Institute may enter into a contract with the National Aeronautics and Space Administration for the management and operation of the proposed space radiation effects laboratory.

(b) To develop a research program in which qualified institutions of higher learning and other research organizations may use the laboratory.

(c) (i) To develop a coordinated program of resident graduate instruction under the joint agreement of the College of William and Mary in Virginia, the University
of Virginia and Virginia Polytechnic Institute and such other institutions as may hereafter be affiliated;

(ii) The guiding principle for the development of graduate instruction to be that it is a cooperative venture, utilizing the capacities and resources of existing institutions. The venture is not to be regarded as a new institution, completely separate in function and control from the institutions that will join to provide such service. The institutions will share cooperatively in the responsibilities for a sound program, each according to its capacities, with no unnecessary duplication of programs.¹³

In July 1963, approximately one month after the first agreement was signed, Governor Harrison formally accepted a 348 acre tract of land from the Federal Government for the VARC project.

Signs of Trouble

In tandem with the VARC developments, SREL design and construction began to take place. The cyclotron took its proton accelerator design directly from a similar machine in Switzerland, the CERN particle accelerator facility at Geneva. According to reports from interviewees in this study, the CERN accelerator was at the time rapidly becoming an obsolete physics tool. NASA’s desire to copy an outdated existing machine brought disdain from the national physics community. Members of the Atomic Energy Commission expressed doubts that the NASA cyclotron could serve any

¹³Original Joint Venture Agreement, July 1, 1962. Document at several locations; this copy found at NASA Langley Research Center, Department of Correspondence and Records Management, Hampton, VA, November, 1992.
true scientific purpose considering that it was being modeled after an obsolete piece of equipment.\textsuperscript{14} William and Mary Physics Professor Robert T. Siegel, former SREL Director, remembers:

...the Atomic Energy Commission, the predecessor of the Department of Energy, was unhappy about NASA building an accelerator which was, at the time, the largest accelerator not controlled by the AEC, [about] someone intruding on their territory...they didn't care for it, but they let the physicists make the noise, which they were happy to do.

The physicists actually said 'Don't squander your money on this, it isn't going to advance the art of accelerator construction and it's not going to do good science'...someone at NASA told me that it even went as far as to wind up on Lyndon Johnson's desk. NASA had tried to gain access to the existing accelerators in the States, but were denied access by the AEC and the physics community at large because they didn't think NASA's space radiation testing constituted particularly interesting science.\textsuperscript{15}

Other interviewees, including Dr. Duberg from NASA and Dr. Klaus Ziock from UVA, voiced similar comments about the cold reception SREL received from the AEC and the national physics community. Dr. Duberg recalls that the construction of SREL happened "in spite of resistance from the physics community." According to Duberg:

\begin{quote}
It was the first major physics lab that was not in the clique. It had little support going for it from the physics community itself; it was regarded as competition, new guy on the block. If it dies, so be
\end{quote}

\textsuperscript{14}Robert T. Siegel, Interview with researcher, The College of William and Mary, Williamsburg, VA, December, 1992.

\textsuperscript{15}ibid.
it—that was their attitude...the physics community did not support it.16

In spite of the problems encountered with the AEC and construction of an outmoded facility, many of the participants, at the time of these events, held high hopes for success. Throughout the building stages, the State Council Director, William McFarlane had been enthusiastic and supportive of the VARC ideas. Important to recall is McFarlane's written suggestion, in the form of a Prospectus, that the three colleges collaborate as a consortium for the administration of SREL. Allegedly, McFarlane presented a bothersome roadblock to Davis Paschal and to Marshall Hahn who each tried repeatedly to get projects for their respective institutions passed through the State Council.

It is Paschal's recollection (per conversation with researcher) that McFarlane would "call upon the folks at UVA to pass judgement on any William and Mary proposals, then subsequently reject them." Warren H. Strother's notes detail a similar perspective from Marshall Hahn. Some evidence for this tendency to send proposals to UVA could be found in the archival documents, although the evidence is

Marshall Hahn's biographer and former VPI Public Relations Director during the Hahn administration, Warren H. Strother, of Blacksburg, provided his notes on the alleged information regarding McFarlane's road blocks to VPI proposals with the State Council. According to Strother's interview notes:

Initially, Dr. Hahn had considerable difficulty obtaining State Council approval for expanding VPI's curricula, especially in the arts and sciences. Bill McFarlane, the Council director, remained a major road block; the staff's recommendations to the full Council rarely were favorable. William and Mary President Davis Y. Paschall, who also had problems with Bill McFarlane and the Council, much later recalled that some of the institutions request for new or revised programs 'simply didn't get approved, and we couldn't find out what happened to them.' Later, Paschall said, 'it became apparent that McFarlane was passing on the requests to Dr. Shannon at the University of Virginia for review and advice.'

Hahn in later years also recalled McFarlane's strong bias, aimed at protecting the University of Virginia's turf. 'You will find in the correspondence statements and reports where McFarlane said that the state can

17 See correspondence from Davis Paschall, College of William and Mary (October 23, 1965) to Edgar Shannon, Jr., University of Virginia, and from T. Marshall Hahn, Jr., Virginia Polytechnic Institute (October 25, 1965) to William H. McFarlane complaining of decisions made by McFarlane and Shannon without prior consultation with other members of the VARC governing committee, and Hahn and Paschall. Document found in Paschall's Papers, VARC Administration, Box 66, College of William and Mary Archives. See also Paschall's letter of October 28, 1965 to Carter Lowence, Gubernatorial Assistant which also complains of the "high-handed" action taken by Shannon and McFarlane in hiring P.C. Gugelot without a unanimous vote from the VARC executive committee. Document found in Governor Harrison's Papers, Box 77, VARC file, Virginia State Library Archives, Richmond.
afford only one university...that was hardly an objective or a neutral stance for the director of the state coordinating body for higher education'...18

Strother's notes also disclose that, unknown to McFarlane or anyone else at the time, Paschall and Hahn collaborated on a plan to have McFarlane transferred out of the State Council directorship and into the position of VARC Director where McFarlane would be their "employee". The following verbatim excerpt from Warren Strother's notes details the Hahn-Paschall plan:

At its June, 1964 meeting at the Homestead at Hot Springs, the Council elected Sol W. Rawles, Jr., of Franklin, as chairman. At that same meeting McFarlane submitted to the Council a list of names of individuals he felt qualified for appointment as staff director. McFarlane himself was moving to the Virginia Associated Research Center as its Director. Marshall Hahn, 25 years later, was reticent about any candid discussion of how such a desirable (from his point of view) turn of events came about. 'I won't say who was the architect of that plan,' he said, his eyes twinkling.

Dr. Paschall was considerably more informative. Paschall and Hahn got together for lunch one day, he said, and agreed that the VARC development had reached the point that a full-time director was needed. They began discussing individuals who might be qualified and appropriate for the position. 'I said the only man I know in Virginia who's got his whole soul wrapped up in VARC is McFarlane...and I don't believe you could find an abler man, a graduate of the University of Virginia, a major in philosophy...' Paschall recalled saying. 'That's capital thinking,' Paschall remembered Hahn responding.

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At the next meeting of the VARC governing committee, the two brought up the subject and readily obtained Shannon's concurrence. Then, Paschall recalled, they went to talk to Governor Harrison about it, 'to give him the benefit of our thinking.' Governor Harrison was 'all wrapped up in this VARC thing; he saw all kinds of potential at VARC if it could be developed...We told the governor that McFarlane had the vision for this thing, and he had to agree, because McFarlane was the man who had sold him on VARC....Harrison finally agreed that the three presidents could offer McFarlane the position as VARC director. McFarlane jumped at the opportunity, and at least two of the three members of the VARC Governing Committee were delighted...The director of VARC reported directly to the Governing Committee.  

Although no paper trail of this Hahn-Paschall plan could be traced through the archival records, it is nonetheless believable because Paschall had a reputation for pulling behind the scenes "coup"s that are well documented in the Kale, Smith book about Paschall's leadership style.  

Klaus Ziock, the acting temporary director of VARC at the time of the McFarlane plan, said in an interview with the researcher that he had no interest in being an

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20 See accounts describing Paschall's political savvy on pages 76, 77, 78, 131, and the entire account of Chapter 7 "The Colleges System." Kale and Smith, op. cit. See especially, p. 78 where the text reads: "In all of his many career achievements Paschall points to this statement as being one of his best and most subtle behind-the-scenes coups."
administrator and wished only to conduct physics experiments on the cyclotron. Ziock was happy to return to UVA as a professor.\textsuperscript{21} Paschall and Hahn did not have to work too hard to convince McFarlane to join VARC as the Director; as Strother's notes previously explained, McFarlane jumped at the opportunity.

To replace McFarlane as Director of SCHEV, Paschall recommended one of his boyhood friends, Prince Woodard, to the Chairman of the Council, Sol Rawles, Jr. \textsuperscript{22} Woodard as McFarlane's replacement appealed to Rawles because they had both attended Virginia Military Institute as young men. A verbatim excerpt from Strother's notes relates the sequence of events:

Woodard was then working as an administrator for Temple University in Philadelphia. Woodard and Paschall had gotten their doctoral degrees together at the University of Virginia in 1954. As a State Superintendent of Public Instruction, Paschall had worked closely with Woodard when the latter was director of the Danville School System...Prince Woodard had been Rawles' 'dyke' or rat assistant when Rawles was a first classman at VMI... in any event, Woodard was soon named Director for the Council, and the climate for statewide coordination and cooperation in higher education improved immeasurably, at least from

\textsuperscript{21}Klaus O. H. Ziock, Professor of Physics, interview with researcher, Charlottesville, Virginia, December, 1992.

\textsuperscript{22}Paschall knew Sol Rawles, Jr. well. His father, Sol Rawles, Sr. was a William and Mary alumnus who had married a woman from Paschall's county of origin, Vance County, North Carolina. This information per Warren H. Strother's notes, op. cit.
the viewpoint of Pat Paschall and Marshall Hahn.\footnote{Strother, op. cit. Personal interviews for Hahn's biography, with Paschall, 3-5-89 and Rawles, 8-21-91.}

So, in August of 1964, Bill McFarlane became the first permanent director of VARC and Prince Woodard became the new director of SCHEV. Paschall commented that having Woodard as the new SCHEV director was "like having a brother in Richmond."\footnote{Davis Y. Paschall. Conversation with researcher, December, 1992.}

Meanwhile, NASA, UVA, McFarlane, Virginia politicians, and area business leaders rallied around the VARC ideas and cheered on the construction. On December 15, 1965, a gala celebration was held to commemorate the official dedication of the VARC/SREL complex in Newport News. Important politicians and civic leaders were present to hear NASA and VARC speakers christen the organization. Also speaking that day was Governor Albertis Harrison:

If some years from now some kindly, and elderly, newspaper reporter recalls that there once was a Virginia Governor named Albertis Harrison and asks me in retrospect the accomplishments in which I take the most pride, I am confident I would be able to list first my endorsement of the Virginia Associated Research Center.\footnote{Albertis S. Harrison, Jr. Unpublished. Remarks by Governor A. S. Harrison, Jr. prepared for VARC Dedication Ceremony. December 15, 1965. Virginia State Archives and Special Collections. Papers of Governor Harrison, 1962-1966, Box 80, VARC Dedication, Richmond, VA.}
It had taken four years of planning and building, but finally, the laboratory construction was completed. As part of the agreement, multidisciplinary grants for research and education had been awarded by NASA to William and Mary in October, 1963 and to the University of Virginia in June, 1964; Virginia Tech received their multidisciplinary grant in March of 1965. The contract for the construction of a VARC building was awarded in April, 1965 to a local firm. During the time that VARC had no permanent office space, the Director and his small staff operated from a rented office in the northern section of Newport News.

Bill McFarlane had graduated from UVA with a degree in Philosophy, specializing in Medieval Philosophy. He had no experience in physics and thus had little to offer as the Director of the physics laboratory. According to John Duberg's interview and some archival documents, as originally conceived, the VARC/SREL Director was supposed to be a qualified physicist with administrative ability. The plan never called for a separate set of administrators for VARC and SREL, but apparently, the Paschall and Hahn partnership changed the requirements for both directorships.26

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26See UVA archival records of VARC governing committee meeting minutes where the question is raised about changing the requirements for VARC director. Minutes of Governing Committee Meeting, October 1, 1964, p. 5, "President Hahn reviewed his
In June, 1964, a new description of the Director of VARC was added to the original agreement.

One of the stipulations of that Agreement was that the Director of VARC 'must be a ranking scientist as well as a capable administrator.' The Governing Committee, composed of the Presidents of the three institutions, now desires to change the requirements for the position of Director of VARC to provide that he be a capable administrator.\textsuperscript{27}

Because McFarlane had no physics background, the Governing Committee decided to hire a graduate physicist, David I. Hopp, as the Technical Assistant to the VARC Director.\textsuperscript{28}

McFarlane enthusiastically tried to take the reins at VARC as its new Director. He set about finding a highly qualified physicist to direct the SREL portion of the discussion with Dr. Rose concerning the appointment of a non-scientist as VARC Director and proposed that the Governing Committee summarize for the Scientific Advisory Board the considerations which led to the appointment of Dr. McFarlane as VARC director." Document found in Alderman Library, UVA Archives and Special Collections, Accession No. of Collection, 4137ac, Box RG-2/1, #10, Folder Date and Heading, December 21, 1964, VARC Governing Committee.

\textsuperscript{27}Weldon Cooper, Secretary, The Rector and Visitors of The University of Virginia, Charlottesville, VA, in a letter to Davis Y. Paschall, President, College of William and Mary, Williamsburg, June 5, 1964. "I enclose an excerpt from the tentative minutes of the meeting of the Board of Visitors held today, June 5, relating to the director of Virginia Associated Research Center." Enclosure, Copy to T. Marshall Hahn, Jr. Document found in Swem Library, College of William and Mary Archives, Davis Paschall’s Papers, Box 66, Folder marked AD Council [VARC].

\textsuperscript{28}See VARC Quarterly Report #3, Contract No. NASI-2493, Period Ending September 30, 1964, p. 4. Document found in F.L. Thompson’s files, VARC file, located in Department of Correspondence and Records Management, NASA-LRC, LAFB, Hampton, VA.
project. The UVA faculty recommended a man who had directed a similar laboratory in Holland, Dr. Piet C. Gugelot. McFarlane accepted UVA's recommendation and recalled "we burned up the long distance phone lines trying to negotiate with Gugelot for the SREL directorship."\(^{29}\)

William and Mary's physicists vehemently opposed the salary offer that was being considered for this prospective director. Davis Paschall wrote a letter of protest to Carter O. Lowence as previously cited [see Footnote 17] on October 28, 1965, but five days before then he had written Lowence confidentially on October 23, 1965. Paschall told Lowence he was writing to:

... express certain concerns and reservations as a matter of record...Realizing your keen interest in the VARC situation, I felt that you would like to be informed of these points, and I know that you will treat the same on a confidential basis.\(^{30}\)

Paschall also sent a detailed letter to President Edgar Shannon of UVA explaining his disapproval of the way in which the new director had been recruited, but consented to the decision with reluctance.\(^{31}\) [Paschall enclosed his

\(^{29}\)McFarlane interview, op. cit.

\(^{30}\)Davis Y. Paschall to Carter O. Lowence, October 23, 1965. Document found at Virginia State Library Archives, Governor Harrison's Papers, Box 104, VARC folder, Richmond, VA.

\(^{31}\)Davis Y. Paschall, President College of William and Mary, Williamsburg, VA, 3 page letter of complaint, October 22, 1965, to Edgar F. Shannon, Jr., President University of Virginia. Document found in Floyd Thompson's files, SREL folder, Dept. of
Marshall Hahn wrote McFarlane on October 25, 1965 to say that he would not sign the approval form on the grounds that he did not think a SREL director deserved such a large salary as the one being offered.\textsuperscript{32} Though all the members of the Governing Committee could not agree on the decision, McFarlane, acting as VARC’s Director offered Piet C. Gugelot the position of SREL Director in the Winter of 1965. Gugelot accepted.

On January 1, 1966, representatives from the three VARC institutions entered into the first legal contract with NASA. An excerpt from that contract reads:

\begin{quote}
\textit{WHEREAS, the purpose of the said Center, being a joint venture, is three-fold, namely:}

\begin{enumerate}
\item To contract with NASA to manage and operate the Space Radiation Effects Laboratory.
\item To develop and conduct a Research Program through which qualified institutions of higher learning and other research organizations may use said laboratory.
\item To conduct a resident graduate educational}
\end{enumerate}
\end{quote}

\textsuperscript{32}T. Marshall Hahn, Jr., President Virginia Polytechnic Institute, letter of protest, October, 25, 1965, to Dr. William H. McFarlane, VARC Director, Newport News, VA, copy to Davis Y. Paschall et. al. Letter found in Swem Library, College of William and Mary Archives, Davis Paschall’s Papers, Box 66, VARC Administration folder.
program.\textsuperscript{33}

Though the agreement by VARC to offer graduate degrees from the respective colleges became a hot subject of debate and dissention in the ensuing years [See news articles presented in Appendix E.], the fact remains that there indeed was an explicit agreement by the colleges to offer degrees to students at VARC, in effect waiving residency requirements on the main campuses. All those involved at the time were aware of this agreement and all the presidents who signed the original VARC/SREL contract knew precisely what NASA expected of their institutions.

The first permanent Director of SREL, Piet C. Gugelot, also known as Kees Gugelot, took office in January of 1966, concurrent with the date of the official contract between VARC and NASA. The main accelerator became operational in May of that year. Not more than a few months passed before Dr. Gugelot again became the subject of intense controversy between the William and Mary physics professors and their UVA counterparts. Several pieces of sensitive information concerning this controversy were un-covered in the records

\textsuperscript{33}Official NASA Contract between the Virginia Associated Research Center, an agency of the Commonwealth of Virginia and the United States of America, as represented by the National Aeronautics and Space Administration. NAS1-5700. January 1. 1963. Document found at NASA-LRC files, Department of Correspondence and Records Management, Hampton, VA. For a complete description of the original agreement, see the Appendix B, the VARC Prospectus.
of the William and Mary Archives. According to inter-office memos between William and Mary physicists and Dr. Paschall, the laboratory staff, especially the William and Mary staff, vehemently opposed Gugelot's management and leadership style. The researcher's interview with Dr. Robert Siegel, 25 years after the events took place help to illuminate William and Mary's perspective on this issue.

Dr. Siegel recalls:

Gugelot was all down hill. His first meeting was called with all the physicists saying that we needed to get rid of NASA and get funding from NSF. That was suicidal! I remember I walked out of there saying I was not going to go near that guy because nobody on good terms with him would ever be trusted again, and that's the way it went.

In a separate interview with Bill McFarlane, the researcher learned that some of the William and Mary physicists could not get along with Klaus Ziock either.

Regarding Kees Gugelot, McFarlane remembered:

It's a bad rap to say he was a poor manager. He was a very distinguished physicist. His problem was that he could not, and I don't know if it was a language problem or what--he's Dutch and he had successfully managed a laboratory at Amsterdam, in fact we burned up the long distance wires negotiating [sic]--But he couldn't seem to grasp what NASA wanted. He was a pure physicist, a high energy physicist, and it was

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34 See William and Mary Archives, Davis Paschall's Papers, VARC Box 66, Administration Folder, several lengthy, extensive Interdepartmental Communications dated from October, 1966 through November, 1966. Memos from R.T. Siegel and R.G. Winter to Davis Y. Paschall detailing complaints about SREL administration.

35 Siegel, op. cit.
difficult for him to come down to the level of engineering.

For some people who accused him of being a bad manager I would say that he tried hard, but lacked an applied feel for what NASA was up to. I think that he got a bum rap having to give up the directorship. Although I think in the long run, returning to UVA's campus was very good for him. He may have wound up with a bad case of stomach ulcers had he stayed at SREL.36

From information gleaned during the interviews for this oral history, apparent conflicts between the personnel from all three schools were a source of much bitterness still lingering over events that took place nearly a quarter of a century ago. McFarlane and the Governing committee asked Gugelot to resign his directorship of SREL less than one year after he took the office. The committee hired a temporary replacement, L. Wayne Swenson as Acting SREL Director. [For insight into how this affected Swenson, see his letter to Floyd Thompson in Appendix F.]

Another controversy erupted in the Spring of 1967 over hiring Robert Siegel as an Interim SREL Director. VARC Governing Committee Meeting Minutes report that Siegel had so many pre-requisites for accepting the SREL position that to hire him would necessitate a complete re-organization of

the entire venture.\textsuperscript{37} The minutes report:

The major observations were: 1. That the inelasticity of Dr. Siegel's position would not leave much room for compromise. 2. That it was improbable any reasonable working relationship could be developed between Dr. Siegel and Dr. McFarlane. 3. That to accept Dr. Siegel's proposal would necessitate a major reorganization of VARC and necessitate a change in the contract with NASA. It was the position of the Governing Committee that the Chairman should advise Dr. Siegel that the Committee felt it must respect the integrity of the organization of VARC and could not grant the conditions which he desired as a prerequisite to his acceptance of the position of Interim Director.\textsuperscript{38}

The rivalry between the three schools became more and more intense, with each not wanting to let the other have any advantage. In the words of Melvin Butler, "Hell, those three presidents couldn't agree on a damn thing. After one of their governing committee meetings they couldn't even agree on the minutes." One possible source of the outward rivalry could have stemmed from the alleged alliance between Hahn and Paschall in their efforts to thwart UVA. Unaware of this partnership between his two colleagues, Edgar Shannon, UVA's President at the time of the consortium remembers:

There was always a certain amount of pushing and hauling. I remember the interminable meetings and a

\textsuperscript{37}See VARC Governing Committee Meeting Minutes, March 13, 1967, p. 1-5. Document found at Alderman Library University of Virginia Archives, Accession no. 4137ac, Box RG 211, 11, Folder date and heading, June 5, 1967, VARC Governing Committee Meetings.

\textsuperscript{38}ibid, p. 4.
certain amount of frustration. In my sense, because of the pulling and hauling, we were not able to go ahead as constructively and make the best use of the educational opportunity and the research opportunity. It was far short of what we had hoped for...[but] there were some drops of my blood in the effort. 39

Bill McFarlane, though not a voting member, sat in on the VARC governing committee meetings and recalls that often the vote for decisions was two to one, VPI and William and Mary against UVA. Paschall stated plainly that he and Hahn intended to out-vote Shannon from the start.40 Robert Siegel described his view of the Hahn-Paschall partnership in a 1992 interview:

Hahn and Paschall tended to work together; their interests were not coincident, but close enough together so that often, they could combine and outwit or frustrate the designs of UVA—which seemed to be focused on extending its dominion down here. For example, there was one occasion where they [UVA] offered to teach a whole raft of graduate courses at VARC. Paschall recognized that ultimately the only way to deal with that was to try and frustrate them at every turn—because they would wear themselves out that way.41

One important document for understanding the extent of the inter-institutional relationships is the original agreement that all three presidents signed when they entered the VARC/NASA contract. [The document is presented in its


40Paschall’s conversation with researcher, December, 1992.

41Siegel, op. cit.
entirety in Appendix B, the VARC Prospectus.] One of the points in that agreement was to offer graduate degrees from the participating institutions to students at the VARC site. That UVA attempted to offer degrees and a program of graduate instruction was simply in keeping with their original contract with NASA. However, two of the three presidents had their own institutions to protect and to build. In the words of Davis Paschall, former President of William and Mary, "It was a time of empire building. If you didn’t do what you had to do, you wouldn’t survive."42 Apparently, Paschall saw the granting of degrees by any institution associated with VARC except his own as a legitimate threat to the survival of his college. This fear had a real basis for Paschall; William and Mary was emerging from a period of decline. Its physical plant had deteriorated and a large number of the facilities were in desperate need of renovation.

Prior to the VARC consortium, William and Mary had no doctoral programs and only a limited number of Master’s Degree programs. It was the VARC stimulus that attracted the faculty capable of offering a doctoral program in

"Paschall’s conversation with researcher, December, 1992. [See also Kale and Smith, p. 143 and p. 147. Paschall said, "The survival instinct is not confined exclusively to man and beast; it also applies to nations and institutions."]"
physics. UVA had tried previously to take the Marine Science School from William and Mary and Paschall was determined not to let "the University" have any more influence over his college.\textsuperscript{43}

According to VPI's institutional history, \textit{The First 100 Years}, Marshall Hahn had ambitions for his college. He wanted VPI to achieve formal University status and during his first five years as President (1962-1967), the college grew in leaps and bounds.\textsuperscript{44} After a visiting committee from the Southern Association of Colleges and Secondary Schools had inspected VPI in 1966, they committee members commented:

\begin{quote}
VPI for the past several years seems to have undergone more change than for the preceding quarter of a century, and it is hard to imagine a more dynamic institution. There is no doubt that VPI is a better institution than ever, and is headed upward, steeply and rapidly.\textsuperscript{45}
\end{quote}

Apparently, so deeply seated was Paschall's fear of UVA that he entered into a partnership with Hahn. The two then used portions of the state government, the State Council of Higher Education, NASA, VARC, SREL and the University of

\textsuperscript{43}This was confirmed in two separate interviews, Siegel's and Shannon's.


\textsuperscript{45}ibid, p. 438.
Virginia in order to achieve the goals of their own institutions. Both Hahn and Paschall were determined to bolster their colleges, and to elevate them to university status.

Paschall also wanted to restore the glory he felt William and Mary should radiate in the state. To accomplish this, Paschall relied on his proven method of "going around the flank side of his enemy, rather than to attack him head on." Paschall knew that he and Hahn could always outvote Shannon on VARC policy decisions. The governance of VARC gave all policy-making authority to the governing committee which consisted solely of the three presidents. To Paschall, it seemed as if UVA were encroaching on his territory. Paschall enlisted the aid of Hahn, Woodard, and the Governor's Office to devise a way to prevent UVA from offering degrees at VARC. He coordinated a plan to foil President Shannon by persuading Governor Godwin and Woodard that UVA's program would not be educationally sound.

Paschall and Hahn successfully convinced Godwin that to allow UVA to grant doctoral degrees from quonset huts at

"Davis Y. Paschall. Conversation with researcher, December, 1992. See also Paschall's political methods in Kale and Smith, op. cit, p. 130. "This ominous situation demands an immediate strategy designed to prevent this recommendation going to the General Assembly--a strategy of containment that will buy time, and applied indirectly as a flanking maneuver rather than one of head-on opposition," he [Paschall] wrote in his notes."
VARC would be a travesty for the Commonwealth. He and Hahn also used the state funding policy to clinch the argument. If graduate degrees could be granted from cheap metal buildings, then why should the State continue to fund the heavy budget demands of the UVA physics department in Charlottesville?

The argument succeeded and Governor Godwin, advised by the State Council led by Prince Woodard, denied UVA the opportunity to offer graduate degrees from the VARC site. This action directly contradicted VARC's agreement with NASA and a legally binding contract. At the time of these events, no one seemed to know that Paschall and Hahn had orchestrated the entire sequence.

Edgar Shannon remembers the day in the late summer of 1967 when he learned that the state would not approve UVA's proposal for a graduate program at VARC leading to degrees.

I was in Washington, had to be in the late 60s, on active duty in the Naval Reserve at the National War College and the Governor called me to his office, with Paschall and Hahn and Prince Woodard and me. I had to drive down from Washington on a Friday afternoon, about 5 p.m. I got to the governor's office. William and Mary and VPI were saying this wasn't a viable academic program, that what we were trying to produce was a scrimshaw academic program, it didn't have the resources, it didn't have a library, it wasn't educationally sound.

We thought it was; we thought it had a lot of value. I think it was partially that the State Council was on their side. It was just torpedoed. We thought it was viable, were pushing for it and were willing to do it. I thought Dr. Hahn was pretty sanctimonious about the
damn thing. They just didn’t want to do it; there was institutional rivalry. We had more graduate strength than William and Mary and we were closer than VPI. They saw us as getting a major advantage out of this and essentially didn’t want it to happen.

I don’t know what the State Council’s view was—they were trying to modulate between the institutions and they persuaded the Governor that it wasn’t educationally sound and that it wouldn’t be accredited. We were pretty annoyed by that, because UVA certainly feels very strongly about the quality and standards of its work, and we thought we could guarantee it. Anyway, I guess, it was partly a political tug of war. As I see it, the University of Virginia and NASA simply lost out.47

Here is a paraphrased account of the same meeting from Paschall’s perspective. According to Paschall: Governor Godwin became so distressed with the constant VARC bickering that he called a special meeting in the summer of 1967. He even called Shannon back from the Naval Reserves in D.C. The Governor told us that he was tired of the fray, the UVA plan to offer degrees was shelved. Why did UVA need all that money from the General Assembly if they could offer degrees from quonset huts at VARC? If the legislators see that you can operate on a shoestring, then you may be forced to do without the funds you have now. The Governor told us that he was going to re-organize the center and give it to just one of the colleges. He would let us know shortly which institution he chose.48

48Paschall’s conversation with researcher, December, 1992.
Just days later, VARC as originally conceived, took its last breath. No graduate degrees had been granted by any of the institutions to students in residence at VARC. Sadly, the Directors of VARC/SREL were in many ways a means to the ends in the master plans of two state institutions. The directors had no real policy-making authority. Their attempts at leadership were met with strong resistance at every turn and in reality, their hands were tied.

In September of 1967, Governor Mills E. Godwin, Jr., by the power of Executive Order, officially dissolved the VARC consortium, placing the operating contract and the property management under the sole direction of one of the original colleges, William and Mary. NASA was stunned, Bill McFarlane was shocked, Shannon felt relieved to be rid of the constant hassle, and Hahn and Paschall silently relished their victory.

The year after the re-organization of VARC, the Newport News, Virginia newspaper, the Daily Press ran a four-part series of articles investigating the institution. The following excerpts from the Daily Press, March 28, 1968, should clarify the effects of the Hahn-Paschall partnership once and for all.

Governor Mills E. Godwin, Jr. in a prepared statement for the Daily Press, asserted the state never intended for VARC to become a separate degree-granting institution.
Dr. Prince Woodard, executive director of the State Council on Higher Education, has since underscored the governor’s position by maintaining that nowhere in the official documents attending VARC’s creation was mention made of degrees being earned for work done strictly at the Peninsula site.

Dr. John E. Duberg, an assistant director of NASA’s Langley Research Center, declared, ‘There was never any question in my mind—or in anybody else’s—that they were going to grant degrees for work done strictly at the VARC site. That was the understanding. If that was not intended, why should we have gone into it in the first place? We had and still do have a perfectly good in-house extension program through the University of Virginia and Virginia Tech.’

The Langley official’s version was seconded by Hartley Soule, the retired assistant Langley director with whom NASA contracted to look after its interests in local graduate education, specifically VARC. Soule states, ‘Either they were trying to pull the wool over NASA’s eyes in the beginning, which I do not think was the case, or they have simply changed their minds and are too embarrassed to admit it.’

A concerned Floyd Thompson of NASA received assurances from Paschall that everything would continue as originally planned, that offering degrees was still a priority and would shortly materialize. However, history reveals that no degrees were ever offered from the VARC site. The Center became known as the Virginia Associated Research Campus of the College of William and Mary and shriveled into a shell used for William and Mary graduate education courses, business courses, and their Office of Special Programs, hardly the grand M.I.T. of the South that NASA and McFarlane
had imagined just a few years earlier."
PART II. CONSORTIUM ANALYSIS

The VARC consortium analysis addresses the consortia themes that were presented in Chapter II. Those broad themes include selected aspects of cooperation, consensus among consortium members, the operation of a consortium, and finally, the consortium's service to its individual members. The analysis examines each of the research questions that were presented in Chapters I and III to see how the VARC consortium lined up with the characteristics of both successful and failed consortia.

Aspects of Cooperation

For background, at the outset of an interview, the researcher asked the interviewee what barriers were overcome when the three institutions agreed to form the VARC consortium and to what extent did the interviewee feel that the cooperation was achieved. The first interview conducted for this project took place in a college cafeteria where former NASA Associate Director, Dr. John E. Duberg attempted to recall the words of Robert M. Hutchins to explain why he felt VARC could not achieve effective cooperation among its members. Duberg paraphrased Hutchins with this statement, "the basic concept of a university is a collection of professors held together by a central heating system." Duberg correctly perceived the difficulty in achieving a coordinated effort among several colleges when the
institutions themselves have difficulty maintaining any
sense of community among faculty members. Duberg went on to
describe his experience with the professoriate:

There is no commitment on the part of the professors to
the expansion of the university. What’s in it for
them? I’ve been to some universities where I’ve had to
introduce people that were on opposite ends of the hall
to each other; [they] didn’t know each other, never
spoke to each other. How do you get the whole
university to do anything if you have that attitude
among people?...How do you get people to drive from
Blacksburg? We had hoped for the good of the
enterprise, that they would get committed.50

In addition to intra-institutional attitudes among
faculty, VARC also had to overcome the traditional barrier
of competition between institutions. Bill McFarlane, former
Director of the State Council for Higher Education, points
out:

It is the nature of these institutions and certainly in
the 60s, before states began to put in greater measures
of control, that they were highly individualistic,
highly competitive. They didn’t care for each other in
terms of cooperating, faculty members in particular.
It would be unheard of in Virginia for a faculty member
to permit a degree program, particularly a doctoral
program to operate off campus without there being some
type of residency requirement on campus. We knew this
going in, that there was going to be this limitation.

...because it is within the nature of the institutions
to be competitive. That’s why our country has such a
good system; they [the colleges and universities] are
inherently competitive, whether its football or high
energy physics.51

On the subject of academic physicists cooperating in the management and operation of a Federal Laboratory, Robert Siegel's comments disclose another insight into the barriers VARC faced in its cooperative efforts. Siegel reflects on what he has learned about academicians over the years:

Physicists haven't been involved in managing much of anything when it comes down to it, except a couple of graduate students. It happens that this is why college professors get to think they know everything, because they get to manage a couple of graduate students and teach some courses, and nobody ever tells them how badly they're doing, so they come to think they must be doing it well and by extension, they think they can do anything well.52

VPI physics professor and former VARC faculty member, Kazuo Gotow, suspects that the three VARC colleges entered into the joint agreement without first taking down the obvious barriers to cooperation that may have hindered its success. Gotow recalls,

After I arrived and got into the VARC activities, I gradually came to the realization that many university rules contradicted the VARC idea, residency for example. And of course this is hindsight, and maybe it is sarcastic to say this, but although the consortium members had a great idea in '62, they did not face seriously the problems with which they would be confronted.

Within VPI, the university saw a great advantage to increase good science and engineering faculty members with additional state and federal money, but on the other hand, the VPI faced the potential loss of graduate students on campus who would have come from the Hampton area. Because if VARC [graduate programs] had been established, its program would have absorbed

these students from its local area. Also, for faculty in the engineering field, the SREL/VARC really didn’t mean anything because it was a tool for a very specific area of physics. Therefore, being at VARC or residing at VARC, participating in research and graduate instruction, [for engineers] had no merit at all. In fact, the only thing they could think of was a disadvantage being away from the main campus of the university and its cultural environment. And therefore, being at VARC probably would label them as second class faculty members in the university.53

In summary, the colleges participating in the VARC consortium faced numerous barriers that impeded their cooperative efforts. As detailed in Chapter Two, the tradition of institutional autonomy and inter-institutional competition flew in the face of the three colleges attempting to manage cooperatively a federal facility. The departmental and individualistic nature of the faculty created other barriers. Another substantial barrier to cooperate in a joint education venture was the tradition of residency requirements at each of the state institutions.

In spite of the barriers, the three colleges did cooperate long enough to form a consortium. Each of the participants looked for some type of gain from the consortium arrangement. In the words of Klaus Ziock, the physics professors saw the VARC/SREL project as a chance to develop their departments. Ziock recalls, "To get this thing going for three schools who did not have a research

53Kazuo Gotow, tape recorded interview questions and answers mailed to researcher, January, 1993.
facility of their own, it was a life-time opportunity.”

Though this seems to conflict with Ziock’s previously mentioned attitude toward the machine itself [See Part I.], he explains the contradiction this way:

NASA held the purse strings, so NASA had absolute control over SREL. I don’t think any of the physicists would have built that machine, but the three presidents supported it and the [state] physicists would not have downgraded the machine or talked to the presidents [about it], because that machine was better than no machine at all. The one that was built was the one we were going to get.55

Kazuo Gotow, the physics professor from VPI had similar comments and pointed out another drawing card for the physics departments involved. "This program offered a great advantage to participating institutions in that they could add some ten faculty members in physics research areas with such an advanced research tool in physics coming available.56

Bob Siegel, William and Mary physicist, voiced his attraction to the research tool that NASA offered. Siegel had come from the Carnegie Institute of Technology where research opportunities were dwindling and he saw the SREL project as a way to make it in a "smaller pond." William and Mary had recruited him in 1963 for the express purpose

54Klaus Ziock, interview with researcher, December, 1992.
55Ibid.
56Gotow, op. cit.
of building a doctoral program in physics. VARC/SREL became
the thrust of that effort, with NASA giving a substantial
grant to William and Mary to help with the departmental
build-up.\(^7\) According to Siegel, even while consenting to
the consortium arrangement, William and Mary had every
intention of keeping UVA and VPI out of its backyard.
Siegel recalls:

> Each institution thought they would get something out
> of it, but behind the scenes, William and Mary stood to
> get the largest benefit. They [the three institutions] just
did not want to be left out of any development
> that might accrue and they each recognized in order not
to be left out, they would have to participate in a
> positive way.

> You can’t just stand there and oppose or connive,
because shortly, people will recognize what you’re
doing and start to leave you out. So they all
recognized...that they had to offer something and
participate in it. It’s just that they all had
different goals. It’s another principle... all men
mean well, so to speak, but they have different
objectives.\(^8\)

Unaware of the physicists’ comments, Bill McFarlane,
Director of SCHEV at the time of the initial agreements,
feels that the colleges were pressured into the consortium
arrangement.

> The idea was kind of crammed down their throats...the

\(^7\)In fact, all three colleges received grants from NASA as was
noted in Part I of this Chapter. William and Mary was the only
institution of the three which did not already have a doctoral
program in physics.

\(^8\)Siegel, op. cit.
consortium was forced on them. They [the presidents] never said they liked the idea of VARC. [It was] the momentum of the idea—the Governor’s response because he saw industrial development, my response and Soule’s too, because we saw a cutting edge type of higher education development.

They [the presidents] could have blocked VARC, but they couldn’t afford to because the governor was so strong on there being something down there and in serving NASA’s needs.59

In spite of McFarlane’s comments about his perception of political pressure, in order to have joined the consortium, the three presidents each saw something to be gained in the venture for their respective institutions. In fact, each of the participants had their particular motivations. Paschall saw the opportunity to have William and Mary emerge from the sleepy little college stereotype and become a full-fledged university. VARC/SREL appeared to be a fine spring board for his plans to build up his college and strengthen its graduate programs. To illustrate this linkage, Bob Siegel, the physicist from the Carnegie Institute that Paschall recruited to build the physics department, later became William and Mary’s first Dean of Graduate Studies.

According to Warren Strother’s notes that were presented in Part I of this Chapter, Marshall Hahn, from VPI, apparently wanted to keep UVA from getting any more

59McFarlane, op. cit.
influential in the state than it already was. Though Hahn has refused to comment, the other interviews certainly suggest this interpretation. In addition, Hahn himself was a physicist, a distinguished graduate of M.I.T. He had initially come to VPI as the Physics Department Chairman. After serving in that capacity for several years, he joined Kansas State University as the Dean of Arts and Sciences. Later, VPI invited him back to serve as its President. As a former physics department head, he had to have believed that VARC/SREL would strengthen his university’s physics program by attracting funds and additional faculty.

The University of Virginia was the most prestigious institution in the Commonwealth. Nationally, UVA ranked among the top twenty institutions in the American Association of University Professors’ list of faculty salaries during the 1960s. What did UVA see in the VARC venture? Dr. Edgar Shannon, former UVA President, summarizes his institution’s perspective:

I guess the initiative came from William and Mary, because they were close to NASA. But it appeared to UVA, and to VPI, I suppose, that we had larger graduate programs, [were] primarily research institutions, had graduate work going, and William and Mary was going to have to build up their department in order to participate. So we felt, and the State Council, I

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60 Lyle Kinnear, p. 409.

suppose, to some extent as well, felt that if we were going to have a research facility in high energy physics that the major graduate institutions ought to participate in it.

We had expertise and graduate education already going on and there was a considerable pattern [of cooperative ventures] in terms of physics research in consortiums throughout the country—operating Lawrence Laboratory and other laboratories—so that it seemed like a reasonable thing to do and a way to get the state's resources used to the best advantage. I think it was also to the best advantage for NASA and their research tool. It seemed like the best arrangement all the way around, if we could work it out. Sure there was a bit of institutional rivalry, that nobody wanted to get left out, so the best way to do it, was to do it together.

We [UVA] showed our willingness to try to do something like this, to try to provide some of our facilities to meet state and national needs and to be seen as not just sitting up here contemplating ourselves as the major research university in the state. We were willing to do our part. The major impetus came from our faculty. The president and the board must get into it and become a spearhead for the organization, but if the physics department here had not been strongly in favor of it, then I would not have been involved in it.62

Obviously, all of the three presidents, as Siegel commented earlier, had good intentions, but they each had different objectives. Paschall wanted to build up his entire campus which was at the time, not prepared or staffed for a large graduate endeavor.63 Hahn apparently wanted to build VPI physics department and keep UVA from gaining any


63 See Kale and Smith, p. 70 and the "Crisis in Facilities", Chapter 9.
more turf or prestige in the state. Shannon wanted to keep the UVA physics professors happy and participate in what seemed like the right thing to do at the time. The Governor and the State Council saw an educational-industrial complex that would strengthen Virginia and serve as a model development for education throughout the country. NASA-Langley, still stinging from the political move to locate the manned space project headquarters in Texas, wanted not only a tool to conduct space radiation experiments, but a nearby facility to train their employees and grant them graduate degrees, perhaps hoping to regain their preeminence in the National Aeronautics and Space Administration Program.

Once the agreements were made and the contracts were signed, exactly how did the consortium fall out along the lines of the specific research questions raised in the introduction? The questions and responses that lend themselves to quantitative analysis appear in TABLE III,

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"See also Hahn's ambition for VPI gaining University status, Footnotes 44 and 45 in Part I of this Chapter.

"See James E. Webb NASA Director, Washington, D.C. comments in letter to Floyd Thompson, NASA Director, Langley AFB, Hampton, VA, February 7, 1963. "We will get better work there (at the mother center from which all of NASA sprang) if we can get rapidly in motion with the graduate education phase [of VARC]." Document located in NASA-LRC Department of Correspondence and Records Management, Document number A184-4, Floyd Thompson's files, Hampton, VA.
Appendix A. The following discussion of these questions attempts to give more detailed, albeit qualitative, responses.

Consortium Consensus?

"Did the consortium leaders and cooperating institutions establish a consensus on the mission and purpose of VARC?" Any successful consortium, according to the literature review, must establish a consensus among the participating institutions regarding the consortium’s mission or purpose. In answer to this question of consensus, most of the interviewees said "no." Of the nine interviewees whose responses appear in TABLE III, only Edgar Shannon thought that the institutions established a consensus on the mission and purpose of VARC. Shannon states:

We had to, we had a legal entity. I think our UVA lawyer drew up the constitution or by-laws for VARC—a real agreement really forming the consortium of the Virginia Associated Research Center. The mission was for high energy testing that NASA needed, but also for educational purposes of high energy physics.66

John Duberg, former NASA Associate Director recalls that even though on paper the NASA-VARC contract specified clear goals and objectives, the institutions were not entirely supportive. Speaking about his disappointment with VARC, Duberg said,

66Shannon, op. cit.
I came to the conclusion that two governments can never accomplish anything because of the bureaucracy. The reason they can’t is because you’re never dealing with two principals. Two colleges, the same thing, you can’t just deal with a physics professor. You have to have him talk to his department chairman, to the dean, to the president, and you have to go all the way to Richmond, and the whole gamut. By the time you get through all those people, who’s got any enthusiasm left for anything? When you get one private university, they can say let’s go and avoid all the bureaucracy.\textsuperscript{67}

As mentioned earlier, another NASA representative recalled that the three presidents could seldom agree on the minutes of their executive committee meetings. Bob Siegel, the William and Mary physicist, remembered the conflict among the institutions that resulted from the original agreement, and his insight adds to the consortium consensus analysis.

Shortly after I got here, there was one great donnybrook—a battle between William and Mary, UVA, and VPI—the struggle of the two titans and William and Mary. UVA lawyers dominated the [state] legislature, and VPI was powerful. William and Mary was the smallest and politically the weakest because it didn’t have an endowment and its law school was very small and threatened with de-accreditation because of the small library and inadequate teaching facilities.

NASA was building the largest machine between Pennsylvania and Texas. NASA wanted it to be used well and wanted to show the AEC and everyone else that they could do good science, and not just engineering. But then it became a battle between the institutions, a donnybrook. It was a real brawl that developed.\textsuperscript{68}

In sum, for this consortium, there was only consensus on

\textsuperscript{67}Duberg, op. cit.

\textsuperscript{68}Siegel, op. cit.
paper in the form of the original VARC agreement. Practically speaking, there was no consensus on the mission and purpose of VARC. Committee meeting minutes throughout the entire consortium period of VARC’s history attest to the endless string of controversy.

Cooperative Efforts, Goals and Objectives

It becomes obvious that several other characteristics of successful consortia were not a part of the VARC scenario. Previous interviewee accounts described in Part I of this Chapter, combined with the quantitative results in TABLE III, Appendix A, can be used to answer the following set of questions.

"Were cooperative efforts among the institutions real?"
All of the interviewees agreed that the efforts were not real, but were in fact, token, as each institution pursued its own objectives.

"Did each member president support the idea in theory and in practice?" Only one physics professor thought that the presidents supported the idea in theory and in practice. All of the other interviewees, including the two presidents, believed that the member presidents did not support the venture in theory or in practice. Paschall’s answer has to be inferred from his actions; likewise, Hahn’s answer must be inferred from his actions. Shannon answered directly based on his assumption that the other two president’s
"torpedoed the idea."

"Did VARC have clear, concise goals?" In fact, it did, as the prospectus and formal contracts will attest. [Please refer to Appendix B]. However, practically speaking, the presidents, specifically Hahn and Paschall, did not agree with the stated goals and had little intention of promoting the goals or objectives except where they would benefit their own institutions. The State Council and NASA representatives, and Drs. Shannon, Gugelot, and Gotow formally answered "yes" to this question, recognizing the formal agreements. The other interviewees, physicists Siegel, Ziock, and Jenkins stated "no" to this question. These men could not rationalize VARC becoming a graduate education center, consistent with the needs of their institutions, and therefore, could not agree that VARC had clear, concise goals.

"Were all member institutions equally represented in the governance of the organization and in practice, were all members able to exert equivalent influence?" After reading the information recorded in Part I of this Chapter, the answers clearly fall into place. Yes, in theory, all institutions were equally represented, they each had one vote on the Governing Committee. But in practice, because of the Hahn, Paschall alliance to neutralize UVA, all members were not able to exert equivalent influence. Dr.
Shannon was outvoted at every turn, he became frustrated and discouraged, just as Hahn and Paschall had intended.

Shannon recalls:

I’ll never forget I wore myself out at those damn VARC meetings, trying to get the thing to work. It was one of the most frustrating things I ever got involved in. It was far short of what we had hoped we could achieve, and we did derive some benefits, although there were some drops of my blood in the effort...I can remember day long meetings where we went round and round.69

Another insight into the problem of each president not being able to exert equivalent influence came from a personal letter to the researcher. Former SCHEV councilman and Richmond attorney, Joseph E. Blackburn writes:

I must point out that Marshall Hahn, Edgar Shannon, and Pat Paschall were strong-minded individuals. In my opinion, much more forceful than the present heads. Dr. Paschall and Marshall Hahn were much better politicians than Edgar Shannon. I use politicians in the sense of knowing how to get things done the way you want them done.70

In conclusion, the presidents of the member institutions theoretically had an equal representation in the consortium. However, in practice, the two-to-one voting strategy and the alleged hidden agenda left one president without the ability to exert influence equivalent to that of the other two presidents.

"Was there community support for VARC and how was it

69Shannon, op. cit.

70Joseph E. Blackburn, Richmond, VA, February 23, 1993 personal letter to researcher.
manifested?" Comments here ranged from interviewees not knowing anything about community support to elaborate details of the business and industrial community attempting to support the VARC consortium with a research park near the VARC site on the peninsula. Documents found at the State Archives in Richmond, plus NASA correspondence, confirm that, indeed, a research park was being actively planned.71 Comments also included the Commonwealth's support of the venture. No one knew why the research park did not become a reality in the 1960s. Of the interviewees that knew about the research park proposal, comments indicated that probably, for this time in Virginia history, an idea like VARC's Research Park was out of place.

For instance, consider the following comments from two interviewees who participated in the Research Park Proposal for the Oyster Point Steering Committee [cited in Footnote 12, p. 65]. Bill McFarlane's statements and John Duberg's comments about Virginia conservatism are very similar, yet each man was unaware of the other's views. McFarlane recalls:

Virginia is one of the most conservative states in the Union. I believe Colgate Gardner used to say that North Carolina would try something, find out it didn't work, and abandon it before Virginia would make up its mind about doing it in the first place. I think the

71 See Footnote 12, in Part I of this Chapter.
VARC idea was at least 10 years ahead of its time.72

John Duberg reflects:

I think it was just plain Virginia conservatism on the part of the political process, the people who move things. Virginia doesn't believe in government leading anything, unless those people had a gut feeling something needed to be done. But not even with the support of the governor, because I don't think he had the slightest idea how to lead a parade on something like that. It just wasn't in the cards for Virginia, they just weren't aggressive. I guess it was too soon for the state of Virginia which is not terribly aggressive about public activity. So, it was like an idea before its time.73

The state did support VARC during Governor Harrison's tenure, and McFarlane led the State Council's support of the consortium for the three years 1961-1964, before he became VARC director. The local community of peninsula business and industry leaders, plus the state legislators of the Peninsula led a successful campaign to purchase surplus federal land adjacent to VARC/SREL. After McFarlane left SCHEV, the council was not as supportive of the consortium. As reported in earlier sections, led by Prince Woodard, the State Council began to side with Paschall, Hahn, and Governor Godwin in dissolving the consortium and placing the Center under William and Mary's jurisdiction. The conclusion is unclear, part of the community did support VARC, another part of the community did not support it.

72McFarlane, op. cit.
73Duberg, op. cit.
Operation of the Consortium

The next set of research questions has to do with the operation of the consortium. "Was there open, two-way communication among the institutions belonging to VARC?"

Here the interviewees are almost evenly divided between the yes and no responses. Those who answered "yes" included UVA and VPI representatives, those who answered "no" included NASA representatives and State Council representatives. Bob Siegel did not answer this question directly, but based on his testimony, one can assume that he would have to answer "no." If the reader takes the plans of Hahn and Paschall into consideration, then the reason for this split stems directly from their covert partnership. UVA representatives and VPI physicists were probably not aware of the Hahn and Paschall plans; so they assumed that communication was open and two-way. Because of the apparent confusion within the consortium and its perceived lack of progress, the State Council and NASA representatives assumed that communication between the institutions was not good.

An observation by NASA's Melvin Butler confirms the consortium confusion and lack of communication:

There was a power struggle between the three schools, but you would have to be in there to know it. Those on the outside wouldn't have known it. The way we figured it, UVA and VPI would kill each other and William and Mary would take it. Hahn was an operator, I'll tell you. We couldn't understand what in the hell they were doing sometimes. We thought it was jealousy between
the three schools. We did not know about UVA's attempt to offer degrees being turned down by the state. If money from the state were the problem, we could have fronted the money. We had money to burn at NASA.\textsuperscript{74}

"Did the consortium leaders engage in systematic, future-oriented planning?" Answering primarily for the SREL part of the endeavor, Ziock, Siegel, and Gotow answered yes to this question; they each believed that the SREL management engaged in incremental, systematic planning for the laboratory itself.\textsuperscript{75} But SREL was not the VARC consortium, so when the physics laboratory is not considered, everyone, including these three physicists answered no. McFarlane, the consortium’s first permanent director, answered that the leaders depended on him for any planning, yet ironically rejected all of his plans.\textsuperscript{76} As disclosed in Part I, two of the colleges appeared to be pursuing plans for their own institutions, rather than planning for any VARC success.

"Was funding adequate to meet the goals of the mission?" Assuming the mission was to carry out the three original tenets of the agreement, that is, to cooperatively manage and operate the SREL, to engage in research, and to

\textsuperscript{74}Butler, op. cit.

\textsuperscript{75}This contradicts Siegel’s outcry of poor SREL administration in Part I. See Footnote 34 in Part I.

\textsuperscript{76}See Footnotes 29 through 32 in Part I of this Chapter.
establish a graduate education program involving the faculties of the three institutions, then facets of each of these tenets needs to be examined separately. All of the physics professors, McFarlane, Blackburn, NASA representatives, and Shannon agreed that the research funding was more than adequate. All interviewees agreed that the management and operational contract received adequate funding during the time NASA conducted its research on space radiation, which covers the VARC consortium period, 1962-1967. The educational funding appears to have been the only area that was under par. As the reader may recall from Part I of this Chapter, Paschall and Hahn convinced Governor Godwin that the state could not afford to fund a graduate program at VARC and simultaneously fund large graduate physics programs on the UVA and VPI campuses. McFarlane and Shannon each made comments alluding to the finite resources of the state and the vigorous competition for funds that existed within the state legislature.

Granted, the answers to this funding question are complicated. Yet, another complication, which may add some confusion, must be mentioned. William Strother points out in his Hahn biographical notes that a piece of funding correspondence, found in Hahn’s Presidential Papers at the VPI archives, was never mailed to its intended recipient, James E. Webb at NASA Headquarters in Washington, D.C. In
the correspondence, March 11, 1967, an unsigned (and possibly a draft) letter from Hahn to James E. Webb, Chief NASA Administrator, Hahn details a progressive decline in NASA funding over the period, September 1, 1965 to August 31, 1967. In a summary paragraph, Hahn closes with these words.

The efforts of VPI, as well as of the other institutions, to develop a strong research program at the Space Radiation Effects Laboratory face a crisis at this time through lack of funds. The whole program of high-energy physics research is in serious danger of collapsing unless reasonable financial support is made available on a continuing basis. Accordingly, it would be my hope I might come to Washington to discuss this matter with you. I believe this to be in the very best interests of VPI and NASA. 

One must now ask the question, why did Hahn not mail the letter in which he so carefully describes the crisis in funding? Apparently, this letter was composed by Hahn less than six months before the meeting in Richmond where Governor Godwin denied UVA the right to grant degrees from the VARC site and informed the participants that a reorganization was immediately pending. Could Hahn have known then that Paschall was orchestrating the events necessary to upset UVA's plans and take VARC for William and Mary? One

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could assume, based on the hidden agenda reported by Strother's interviews, combined with this letter found unmailed, and Paschall's history of behind the scenes coups, that indeed, the demise of VARC was eminent. Hahn may have decided that his request for a conference would have been moot, and therefore, did not mail the letter.

The funding question has no clear answer. Those interviewed expressed their responses based on different sets of criteria. The physicists answered according to their perspectives as SREL scientists and subsequently reported that research funding was more than adequate. The NASA representatives felt that they funneled huge sums of money into the project every year they were associated with it. The educators, McFarlane and Shannon, responded to the question based on the apparent lack of state funds to generate an additional graduate program on the VARC site. Hahn's letter throws in a monkey wrench. He complains to NASA-Headquarters about a decline in SREL's research funds to VPI physicists. Suffice it to say that no single conclusion regarding funding can be reached, except to say that adequate funding depended on the perspective of the interviewee.

"Were the organizational structures of VARC adequate to carry out its mission?" Considering the answers to the mission question discussed earlier, this question may be no
longer relevant. It is clear from the original VARC prospectus that definite structures were set up to organize the consortium. There were four basic committees. The governing committee, which had all of the power and decision making authority, consisted solely of the college presidents. The presidents rotated the chairmanship of the committee. The other committees were made up of representatives from all participating institutions, including NASA, plus some scientists from the nation at large. The following excerpt is taken directly from the original VARC prospectus.

The Governing Committee, composed of the three presidents of the sponsoring institutions, has been delegated ultimate authority by the several Boards of Visitors for the management and operation of VARC.

The Director of VARC will be appointed by the governing committee and be responsible to the committee for implementation of basic policy. He will be in charge of the day-to-day operation of the Center.

The Administrative Council, composed of staff members from the sponsoring institutions and NASA, will develop and recommend policy for the day-to-day management of the Center. It will advise the Director on matters concerning research administration and needs of the Center.

The Scientific Advisory Board, composed of scientists from the institutions and from the country at large, will review the research program and advise the Director and Administrative Council on the technical development of the research program.

The Graduate Study Advisory Board, representing the sponsoring institutions, will serve as an advisory group to the governing committee in the development of...
the program of graduate studies.\textsuperscript{78}

After reading through the list of organizational structures, the inference is that they seemed adequate and appropriate for a joint venture such as the VARC consortium. However, given the reasons for VARC's demise, which were disclosed in the Narrative section, Part I of Chapter IV, this question of organizational structure takes on a whole new dimension. If the organization had vested all of the power and decision-making authority in a governing committee that was characterized by a two-to-one voting strategy, what real progress could have been accomplished? The Director was given no real power or authority. The other committees functioned to advise the Director or advise the governing committee. The organization, based on the hidden agenda and the presidents of three colleges which were competing to advance their own institutions, seemed inherently programmed to self-destruct.

Leadership

The next question deals with leadership. "While VARC functioned as a consortium, was there strong, effective leadership?" The obvious answer is no. Everyone

\textsuperscript{78} The Commonwealth of Virginia. VARC. A prospectus in support of a request for a grant of federal surplus land submitted to the U.S. Department of Health, Education, and Welfare on behalf of the Virginia Associated Research Center. May 1, 1963. Entire document appears in the appendix, courtesy of NASA-LRC, Department of Correspondence and Records Management, Hampton, VA.
interviewed felt that all of the VARC/SREL directors during the consortium period lacked good leadership ability. Comments ranged from someone accusing Ziock of "ruffling feathers unnecessarily" to many people accusing Gugelot and McFarlance of poor management skills. Realistically, because of the governance structure vesting all power with the Governing Committee of three rival presidents, the Directors were off to a bad start as soon as they took office.

Ziock, who Duberg says was intended to be the permanent director, only held the position of VARC/SREL director up until the time that Governor Harrison offered the position to McFarlance. As previously discussed, Ziock said he could have cared less and was happy to be returning to strictly physics research and his graduate students at UVA. When he left VARC, the buildings were in the initial stages of construction, and in his words, he had nothing substantial to coordinate.

McFarlance left SCHEV in Richmond and came to Newport News to a temporary office space. He was filled with hopes and enthusiasm for what he perceived to be a "model development in higher education." McFarlance, together with UVA and NASA, recruited Gugelot who came for the training of graduate students in a high-energy physics setting, "for what is a laboratory with no students." Both McFarlance and Gugelot faced an unseen factor. Neither of the men had any
idea that the two presidents, Hahn and Paschall, had no intention of following their suggestions. Gugelot faced additional opponents in the form of other scientists, like Siegel, who disliked his leadership of SREL for various reasons. Years later, Gugelot bears obvious bitterness for the hand he had been dealt at VARC/SREL. One interviewee remembers that at the time he was asked to resign, Gugelot commented that he felt he was being discarded "like a dirty glove." It has been reported that Siegel wanted the job of SREL director for himself and that he would never have been satisfied, no matter who was chosen as director.

As for the question of effective leadership, McFarlane shared some of his insight into the situation as a powerless VARC director.

If anyone could have made VARC come alive, I could have. I don’t mean to sound smart alec about it, but I knew higher education inside out, I knew every one of the presidents, I knew the political situation and a lot of the General Assembly, certainly during Harrison’s reign. In fact, I went to him and said we needed someone with a lot of status in this state...to persuade these presidents that they have a golden goose here. I’m really saying that in terms of doing it, I understood what was at stake and had the political clout, but not enough. In fact, I was in the difficult position of working for the very same people who didn’t want it to succeed.

79 For documentation, please refer to Footnote 34, Part I of this Chapter.

80 See also, Footnote 37 and 38.
I did not realize that my hands would be tied when I took the position. If I did, it was, Oh, I can overcome that, through local support. Probably the climax came when the city proposal [research park] was turned down. After that happened [in summer of 1967], I realized that there was nothing else to do.\textsuperscript{81}

Melvin Butler, a NASA administrator, remembers McFarlane's struggle to function as VARC director.

Bill had a hard time pleasing all those presidents and I don't believe any human being could have pleased them. He would do something for Paschall and maybe word would get back to UVA. I could not give you specific examples now. I think if the three schools would have taken the lead and had some plans for the future, things may have worked out. There was a definite lack of leadership. You need a quarterback and Bill McFarlane had no support, McFarlane had his hands tied. I liked to work with Bill. But, oh God, there was tension all over the place. I could see Bill losing weight over the whole damn thing. He stuck with it though.\textsuperscript{82}

Regarding the failure of VARC and his personal development, McFarlane goes on to say:

I probably would have gotten a lot more out of it had it succeeded. But the very experience of it, in fact, I got a laugh out of it once. I made a speech at the dedication and said, 'What's a philosopher doing running such a facility?' And my response was that it would have taken a philosopher to sort out the problems and make it work. Everybody laughed, including Marshall Hahn, a very funny statement.

That was an experience that if I had to do it over again, I would have done it, but I would have done it differently. One thing I would have done before even taking the job is not to think I was that smart, that I

\textsuperscript{81}McFarlane, op. cit.

\textsuperscript{82}Butler, op. cit.
could have outsmarted three college presidents.\textsuperscript{83}

Bill McFarlane was VARC's chief administrator for almost three years. Preceding discussion reveals the rough time he had trying to lead a group of college presidents. McFarlane said he had no warning of an impending VARC reorganization. He was shocked and disappointed to learn that his dream had come to an abrupt end. At Paschall's suggestion, McFarlane resigned from VARC when it became part of the College of William and Mary. Soon afterwards, McFarlane accepted a post as the Chairman of the Department of Humanities at George Mason University.

Gugelot was asked to resign almost one year before McFarlane. Gugelot was extremely disappointed with the way SREL and VARC were being handled. He sent his personal copies of correspondence regarding VARC to the researcher in the hope that they might be useful. The Gugelot correspondence appears in Appendix F along with all of the other letters from persons complaining about the VARC reorganization. Clearly, from the testimony of these two directors, and from that of two interim directors, Swenson and Ziock, the leadership roles at VARC/SREL were inherently weak because of the faulty VARC governance structure. Though strong, effective leadership was needed, there was no

\textsuperscript{83}McFarlane, op. cit.
conceivable way to achieve it under the circumstances faced by the directors.

Consortium Service to Members

Two interview questions can be answered in this section: "To what extent did the consortium enhance programs and objectives of the member institutions, i.e., did each of the cooperating institutions develop a sense of gain and strength by their participation in VARC?" and "Did each institution perceive the consortium as useful?" The discussion which follows provides the reader with the various viewpoints represented by the interviewees.

The first institution to be discussed is NASA-Langley. In Appendix E, several newspaper articles detail the extent of Langley's frustration with the VARC consortium. Some of the comments from the articles appeared in Part I of this Chapter. John Duberg, former NASA Associate Director, remains disappointed over the developments that happened at VARC over 25 years ago.

It never became what Governor Harrison had wanted, an M.I.T. south of the Mason-Dixon line. NASA got an improved physics department at William and Mary, and the laboratory was useful for space radiation effects testing. Many people at NASA thought it was a big disaster because it never developed into the M.I.T. of the south...it never developed the educational program.

About 15 years of NASA involvement went by, I don't think anyone ever said they would kill the idea, but we just kept waiting. We were going to give them seeds and wanted it to grow. We couldn't do much in terms of faculty leadership. We tried to feed students over
there and to give them a spark. I don't know how much money we funneled into the place. Maybe we started with too narrow a base for such an institute, just particle physics. We couldn't call it a great area of NASA-Langley.

Later on, out of our frustration with the thing, we started two other institutions here at Langley, George Washington University, and later, Old Dominion University. This happened as a result of our disappointment with VARC.84

Melvin Butler, another NASA executive during the VARC years, recalls that NASA's real breakthrough with graduate education came when they contracted with George Washington University. Butler adds,

The thing we couldn't understand was how George Washington could do it and the state universities could not, but that's a long story. GW came under the Mid-Atlantic Accrediting Association and the others came under the Southern Accrediting Association. GW came in with a tremendous engineering program and were very easy to work with.

We had been trying to bring graduate education to the Peninsula. Thompson had the idea to make a triangle area like in North Carolina, and it would just grow, grow, grow. The ideas for a research park never happened because VARC just didn't come through with anything. The research park in North Carolina had the educational facilities.

Did NASA get anything out of the VARC arrangement? I assume the SREL facility provided worthwhile scientific data. The project made more people in Virginia more conscious of the need for graduate programs in this era of time. It helped the William and Mary physics department and Old Dominion's engineering department. NASA had use of the facility and would have the use of the ODU facility. After William and Mary took over, VARC sort of petered out. [But] we didn't give up right away. When VARC started offering graduate

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84Duberg, op. cit.
teacher education courses, Thompson said sarcastically, 'well, maybe now somebody's getting educated.' By then, NASA was out of it for all practical purposes. 85

What benefits did NASA derive from its participation in VARC? According to the two interviewees, NASA learned more about the political processes involved with getting something accomplished on a national level, they got a private university to offer graduate degrees, and they had the results of some space radiation testing. Duberg sums it up this way:

VARC served its short term purposes, if you want to say that it helped NASA in manned space craft research, but if you think of it in terms of the Harrison vision, then obviously, it failed. But it brought the attention of this community to a national facility operated privately, working with the organizations you have to work with to get things done on a national level. I think it was a good training ground and CEBAF could be the beginnings of long range success.

The site we were building was destined for the forefront of national activity and most of the schools were not prepared to support that kind of facility with the faculty they had—to be respected on the national level. Not even UVA and VPI, and William and Mary up until that time was just a service school for training high school teachers, so was the math department—it was not an institution to compete at the national level. Of course, that was the whole purpose, to drag

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85 Butler, op. cit. See also, numerous letters during the 1965 - 1967 period to the college presidents and to McFarlane from Floyd Thompson complaining about VARC's slow progress toward achieving the graduate education function. See also news articles from 1966 which quote McFarlane as predicting up to 1000 students enrolled at VARC by 1970. In reality, the center never saw an enrollment of even 100 graduate science students. All pertinent correspondence and articles found in Floyd Thompson's Papers, VARC files, Dept. of Correspondence and Records Management, NASA-LRC, LAFB, Hampton, VA.
all of this up to the national level.\textsuperscript{86}

If we take John Duberg's last statement at face value, then we must say that the VARC-NASA partnership was successful. The three schools in question definitely compete on the national level in this decade, some 30 years after VARC began. If that was NASA's purpose, then the purpose was achieved.

The next section discusses the higher education institutions and their associations with VARC. Did the schools benefit from their association with the VARC/SREL/NASA project? Each of the three original institutions gained a reputable physics faculty and a stronger physics research program.

Klaus Ziock, from UVA, gives his analysis of the benefits to the three schools.

I see VARC as an essential stepping stone to what they are doing now. They all have major groups in the field of medium and high energy physics departments. I don't think that could have happened without their involvement with SREL. Their start, the character of the three departments would have been different if not for SREL. I was attracted to UVA because of SREL, as was Gugelot. McCarthy [the man who designed CEBAF's accelerator] would not have come here if it had not been for our involvement with SREL. I doubt CEBAF would have come here if we did not already have a strong showing in the field of medium energy

\textsuperscript{86} Duberg, op. cit.
The VPI physics professors in the interviews had similar comments about VARC's stimulus to their departments. David Jenkins reports:

The consortium had a big influence on the physics program at Virginia Tech. Up to that point, the physics program had been rather small. They had a small nuclear research program coming on campus, but with VARC, the department had hired a bunch of new young physicists who were involved directly in the VARC program and others who were involved in other areas of nuclear and particle physics and I think we can sort of date the growth of our department from that time.

Kazuo Gotow, also from the VPI Physics Department, responded that VARC had influence that extended beyond his immediate department.

The consortium certainly enhanced greatly the physics departments at the universities. In fact, it created or helped to create strong nuclear physics programs in the member institutions. This area of physics, particle or nuclear physics of SREL's cyclotron, had been completely absent from Virginia universities prior to 1962. This field is now called medium or intermediate energy particle or nuclear physics. The legacy of this laboratory's history extends to the establishment of CEBAF. CEBAF was won primarily by the efforts of many of these physicists who came to Virginia to fill VARC positions or to become VARC faculty members.

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87Ziock, op. cit. And, CEBAF refers to the Continuous Electron Beam Accelerator Facility, located on the former VARC/SREL site. Currently CEBAF is owned by the Department of Energy and managed by the Southeastern Universities Research Association.

88David A. Jenkins, Professor of Physics, Virginia Polytechnic Institute and State University, tape recorded interview, December, 1992.

89Gotow, op. cit.
The benefits to William and Mary have already been mentioned and will be discussed at length in Chapter V. Briefly, the college was transformed during the VARC years from a lean undergraduate institution to a modern university with millions of dollars worth of new construction. The physics department gained a doctoral program, including numerous new faculty. One of those new faculty members, Robert Siegel, later became the director of SREL when VARC was re-organized as a part of the College of William and Mary in 1967. Robert Siegel spoke about some personal benefits that accrued to him as a result of having participated in VARC/SREL.

It was an amazing time where I learned how people interact, a lot I wouldn't have learned otherwise. Of course I learned a lot while I was down at SREL for ten or eleven years, but I think I also learned a great deal from what preceded and what followed our participation in VARC. I think I learned more than my colleagues who never had been out of academics. When I came back, I swore to myself that I would never become involved with administration, would never even try to get involved in administrative responsibility on campus, because I felt that I would be too frustrated.

I quickly saw that it was a heavy responsibility being in control of people's jobs, in the sense that you could hire or fire. Realizing that you didn't make casual remarks if you felt like it, because a man could go home and take it out on his family, if you thoughtlessly took it out on him. There are all these things that academics have no hint of.

Academics, for what they are paid, have the least responsibility for any of this type of thing than probably any other segment of society. I mean, for what they are paid, what do they do? They teach courses and have all these admiring students, none of whom really
gives them a hard time and if they do, it's their job and it's not too hard to stay ahead of them in knowledge of your subject, of course you recognize that you have to do that. The day to day responsibility that real administrators have on their job, academics have no idea.\(^9\)

Siegel's comments could apply to a broad range of people, certainly beyond the physics department faculty. He learned some things that the entire academic community could benefit from hearing.

In spite of the common wisdom's portrayal of VARC as a miserable failure, the complete opposite was in fact the case, at least from the college's perspective. The colleges derived the most benefits from the VARC association. All of the three schools have attained a greater measure of national rank and stature as a direct result of the growth they experienced during the NASA association. All three colleges now participate in the Southeastern University Research Association Consortium which has the management and operations contract for CEBAF [Continuous Electron Beam Accelerator Facility]. In addition, individual physics faculty members reflect fondly on their VARC years and plainly state that their departments owe their growth to the VARC/SREL association. A 1993 letter to the researcher from Kazuo Gotow contains this bit of insight:

The history of VARC has not been documented well, and

\(^9\)Siegel, op. cit.
as you might guess, I spent my best years in research at VARC/SREL. I would like to know as much as possible about what transpired in many people's minds involved in this venture.91

What would things be like for the colleges and NASA if VARC had achieved the goals Thompson had intended? One can speculate that not only would the colleges and the LRC be different, but that the entire Commonwealth of Virginia would have been affected in a positive way. To summarize the answers to the questions at the beginning of this section: The higher education consortium definitely benefitted the programs and objectives of its member institutions. In contrast, NASA was not an official member of VARC, but it provided the bulk of finances required for the system's operation. In a real sense, NASA spent millions of dollars on the SREL/VARC idea and never realized the fruits of the investment.

"Did each member institution develop a sense of gain and strength from their participation in VARC?" Certainly the colleges did. William and Mary and VPI both achieved university status during that decade and all three colleges acquired better physics departments along with the associated benefits of more faculty and more research funds. NASA leaders felt that VARC did not achieve its stated goal

91Kazuo Gotow, Professor of Physics, VPI, Blacksburg, VA, January 12, 1993 personal letter to the researcher.
of graduate education and consequently, NASA had to resort to a private institution, George Washington University to provide their needs in this area. NASA leaders also felt like they had wasted their money at VARC.⁹²

"Did each of the members perceive the consortium as useful?" This question has been thoroughly covered, but to reiterate, the colleges used the consortium as a means to an end. For William and Mary and for VPI, in addition to building stronger physics departments, VARC became a stepping stone to university status. For UVA, VARC heralded a greater physics program and the recruitment of a physicist who would later design a new accelerator for the Department of Energy. For NASA, the consortium caused multiple frustrations. All that NASA derived were the results of its Space Radiation Effects experiments and three stronger universities in the area. In the epilogue, the author will describe the development of NASA's graduate education program under the George Washington University influence.

One last research question remains to be answered. "Was there a fear on the part of member institutions that VARC could grow to usurp their autonomy, identity and distinctive functions?" In view of all the evidence, the answer must certainly be yes for William and Mary and for

⁹² See various articles in Appendix E.
VPI. Near the end of VARC’s consortium life-span, when UVA had planned to offer graduate degrees as the original VARC agreement specified, the other two colleges deliberately sabotaged the plan, as described in Part I of this Chapter. Though UVA’s Edgar Shannon may have suspected sabotage, he did not mention any. Rather, he summed up the other institution’s fears with the following comments:

They [VPI and William and Mary] had institutional ambitions, particularly with the physics departments, they wanted them to develop. VPI didn’t want to be left out but were not as interested in participating in it as we were. I guess they thought that we were going to get some kind of advantage if we went ahead with this [degree granting at VARC]. And I guess the State Council and the Governor saw that William and Mary could do it and they did not want us to [offer degrees] because it would create duplication and cost the state more money. I suppose there would be some tendency if we were offering this degree in physics and had a better reputation, more standing as a graduate institution than William and Mary, that we would have attracted more students."

Some of the specific interview questions could be quantified. The quantitative results appear in TABLE III, Appendix A. In the next chapter, the researcher will explore the conclusions of this consortium analysis, present recommendations for further study and describe some of the implications of this study.

\[93\] Shannon, op. cit.
CHAPTER V
CONCLUSION

The Virginia Associated Research Center consortium ceased to exist on September 1, 1967. In its place, the State Council and Governor Godwin recommended "The Virginia Associated Research Center, a Graduate Center for the College of William and Mary." When William and Mary took over the Center there were a total of 117 graduate students enrolled, representing the three original colleges.\(^1\) Joseph E. Blackburn recalls that the State Council became sorely concerned several years after the reorganization when there was only one student enrolled in a Ph.D. VARC program.\(^2\) As mentioned in Chapter IV, the news reports during the early '60s projected great quantities of graduate students for VARC. For instance, the Richmond Times-Dispatch reported: "Estimates of the number of students who eventually will be enrolled in VARC research and study programs ranged between

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\(^1\)"LRC Graduate Enrollment in VARC Member Institutions (FY 1967)." In Residence: UVA, 16; VPI, 27; W&M, 74. At LRC (UVA and VPI Extension Courses): 135. Document located in VARC file, NASA-LRC Department of Correspondence and Records Management, LAFB, Hampton, VA.

\(^2\)Joseph E. Blackburn, letter to researcher, February 23, 1993. Note: Blackburn also remembers that Bill McFarlane "left the job long before VARC became a major issue for the Council."
The following excerpt from the Newport News paper, *The Times-Herald*, describes the ultimate disappointment faced by NASA-Langley Research Center’s Director Floyd Thompson. Thompson’s ideas for a great research and teaching center crumbled as Myrtle Barnes reports:

Langley Research Center is rather like a bridegroom, who lavished a $16 million dollar gift on his wife, only to be left standing at the church. The gift was a synchrocyclotron. The bride was the Virginia Associated Research Center in Newport News. Langley’s top echelon is plainly unhappy at the confusion which is preventing VARC from accomplishing its prime purpose—furnishing graduate programs leading to degrees without students ever having to leave the Peninsula. The current confusion seems to begin with the State Council of Higher Education’s summer 1967 study which led to Gov. Mills E. Godwin’s reorganization of VARC last fall.

‘I think it would be appropriate for the State Council to show itself on the Peninsula...I think it owes the community an explanation of its purposes,’ [Floyd] Thompson challenges.

Thompson says there is no doubt in his mind that Virginia’s leaders saw VARC as he did back in 1961 when talks first began. Langley officials aren’t angry at the state—they’re not trying to be critical, rather, they are bewildered that a project which held such promise now wallows in a sea of uncertainty. They didn’t say it, but you get the feeling they see themselves like a fellow at the racetrack who put all his money on the wrong horse.4

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Floyd Thompson died in 1976. Did he find the reason VARC wavered off course? According to conversations with his contemporaries, Duberg and Butler, who were interviewed for this study, he did not. In the preceding chapters, we have discovered what stymied Thompson and his colleagues years ago. Based on information disclosed by the narrative and analysis sections of Chapter IV, certain conclusions emerge. The purpose of this chapter will be to explore these conclusions, to suggest various implications of the conclusions, and to make recommendations for further study.

**Conclusions**

The original research hypothesis is not supported. VARC never functioned as a successful consortium; and internal factors, rather than external forces, directed the re-organization in 1967. The consortium analysis in the preceding chapter discussed the various answers to the research questions. This discussion will go further, looking beneath the surface of events for the rationale behind the actions recorded in the narrative.

From the literature review, a statement made by Emmert and Crow in their 1989 article on cooperative university research laboratories provides pertinent context:

...if those who are being served are offered incentives that are attractive enough, that is, in their self-interests, an inter-university consortium can be one useful option through which to gain resources, improve
quality, and sustain institutional missions.5

Early in 1962, the three Virginia institutions seized the opportunity to obtain the use of the Space Radiation Effects Laboratory cyclotron as a physics research tool and as a drawing card for recruiting additional physics faculty. NASA offered each of the colleges a significant multidisciplinary grant in exchange for management and operation of the facility and the promise of a graduate program leading to degrees at the VARC site. The presidents and physics faculty of all three institutions agreed to meet NASA's needs in exchange for the grant money and research time on the cyclotron. At the heart of this agreement was the idea that each of the three institutions would gain a higher quality physics department.

All three institutions were also interested in upgrading their campuses, increasing their enrollments, hiring new faculty, and attracting the favorable publicity that came from an association with NASA during its great race-for-the-moon years. Newspapers as far away as Chattanooga, Tennessee ran stories hailing VARC-SREL as a significant step forward for science and education in the

5Emmert and Crow, op. cit.
Dr. Clark Kerr, president of the University of California System...said in the annual Godkin lectures at Harvard University this year, that the great breakthrough of the academic community was the development of the multi-university. Dr. Kerr said that multi-universities were now emerging in full force in such academic complexes as the Eastern area ranging from Boston to Washington, the Big Ten area including the University of Chicago, the California complex centered at his university system, and the developments occurring in the Texas area. He added that vital to success was the concentration of highly trained personnel and faculty.

It is in this context that the Virginia project opens the door for a significant 'leap forward' in the South. It is entirely designed to develop the well-qualified scientists, engineers, and technicians required to meet the nation's needs in the technological transformation of modern times. And with this kind of quality human resource, the project will serve as one of the magnets for industry that orients itself to urban centers of technology.

What college or university president would not want to have that kind of publicity? On the other hand, what college president would want his particular institution to stand in the shadow of a more prominent one in the pursuit of some great technological achievement? In 1961, the state of Virginia had no coordinated system of four-year colleges


to support the NASA-SREL endeavor. Although the State Council for Higher Education served an advisory function, it had only been active since 1958, and it had little real power or authority. Instead of a state-wide, centrally coordinated university system of higher education, such as is found in California or North Carolina, Virginia went into the NASA agreements with a different governance structure. On recommendation by the State Council, and with the approval of the Governor and the General Assembly, the three state-supported, but fiercely independent institutions, loosely affiliated themselves into a consortium.

One of those institutions, the University of Virginia, had already achieved premier status in the state. It had the top physics department and one of the top two engineering departments in the state at the time. UVA had nothing to lose and stood to gain even more prestige by entering into the contract with NASA. The largest state institution, Virginia Tech [also known in Virginia as VPI, Tech, and VPI and SU, see Footnote 1, Prologue], ranked with UVA as having the one of the state’s finest engineering schools at the time and an established graduate program in physics. VPI could gain an even stronger physics program by

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8For more on UVA’s status at the time see Virginius Dabney, Mr. Jefferson' University: A History, Charlottesville: The University Press of Virginia, 1986.
entering the VARC agreement. Even more important, Marshall Hahn, the VPI President at the time, was on a crusade to elevate VPI to University status. But what of William and Mary? The undergraduate institution had very little to offer the VARC/SREL organization except proximity to NASA-Langley and with NASA’s financial backing, the promise of graduate physics and engineering in the near future. William and Mary, characterized earlier as a "sleepy little college" by Bill McFarlane, literally had the most to gain by joining the VARC association. As Director of SCHEV in 1960, McFarlane remembers, "Paschall asked me when he’d first been appointed president what I thought of his college and I said to be quite honest, it is not in the front ranks of Virginia’s colleges."10

Like the UVA and VPI executives, William and Mary’s leaders wanted the grant money NASA offered. William and Mary’s leaders also wanted additional physics faculty and a quality physics doctoral program because, at that time, it had no doctoral programs. Unlike the two stronger institutions, William and Mary could potentially have lost the most if VARC became as huge a success as its creators envisioned. What would have become of a fledgling graduate

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9See Footnote 44, Chapter IV, Part I.
10McFarlane, interview with researcher, January, 1993.
program in science at William and Mary if potential Hampton Roads area students could just as easily have enrolled in established programs offered by the two stronger, more reputable institutions on the VARC site?

Davis Paschall knew his institution stood on a threshold of change. If the college did not spring forward into the modern world of the American university, it could fall even further down the ladder of four-year colleges in the Commonwealth. From a written memorandum to the author, Paschall’s words describe the situation as follows:

William and Mary had a excellent master’s program in physics, but was deficient in faculty for high energy nuclear offerings and research. It was in the process of constructing the first classroom facility on the new campus, a physics building. It needed, I felt, an approved doctoral program to attract faculty and resources, especially federal grants, to compete adequately in the new venture. The College was offered an enormous grant for this purpose.

Realizing that William and Mary had never offered programs at the doctoral level, I sought an appointment with Governor Harrison to discuss the implications of accepting the grant. I was accompanied by Dr. Melville Jones, Dean of the Faculty of Arts and Sciences—he had been my teacher of English Literature when I was a student many years earlier.

I explained to the Governor that William and Mary needed the additional competence promised by the grant in order to ‘hold its own’ with the other two institutions in the VARC development, but that it would launch programs at the doctoral level, and this would transform the traditional image of the College. The Governor appreciated my ‘frankness,’ and said that it was obvious that the State, as well as NASA-Langley expected William and Mary to ‘do its part,’ and that it should move ahead aggressively in doing so.
The grant was accepted; [in 1963] the College recruited Dr. Robert T. Siegel, an outstanding physicist with highly regarded competence at the high energy nuclear level. He, in turn, recruited a team of several ably qualified physicists...

Soon thereafter, Dr. Thompson [NASA], Rector of the [College] Board of Visitors who was President of the Newport News Shipbuilding and Drydock Company, the President of the Newport News Chamber of Commerce, and Mr. Lewis McMurran, an influential member of the General Assembly [all] appeared before the State Council of Higher Education, and spoke in behalf of my presentation for approval of a doctoral program in physics.

It was approved, and subsequently, the College demonstrated a major role in the VARC development. Incidentally, this VARC 'thrust' heralded a doctoral program in marine science, and two others, as well as an academic Renaissance overall that enabled the College to be officially recognized in 1968 as having achieved modern university status, but retaining its Royal Charter name.11

In order to more fully understand Paschall's perspective and his interest in the events at VARC, it is helpful to look at the College of William and Mary prior to the 1962 VARC agreement. Without going into the details of how and why the College was originally granted a charter from the King and Queen of England in 1693, making it the second oldest institution of higher education in America, the discussion will proceed from the College's history after the revolutionary war. The war of independence left the colonial town of Williamsburg in a virtual coma; the state

legislature moved to Richmond, taking many Williamsburg merchants with them. According to William Oliver Stevens in *Old Williamsburg and Her Neighbors*, the college had no more revenue from the British, and "worried along on a hand-to-mouth basis by selling parcels of land out of the original royal grant."\(^{12}\)

For the next sixty years the college struggled to stay open, but was forced to close its doors as Virginia seceded from the Union in 1862 and all the students and faculty, including the President, enlisted in the Confederate Army. During the Civil War, the Wren building was burned to the ground for the second time in its history. After the war ended, the pitiful little town of Williamsburg had nothing left but its college.

In 1869, the Wren Building was repaired, and a brave effort was made to open the college again, but there was not money left in Virginia to pay tuition or professor's salaries. It was hard enough just to keep alive. After a desperate struggle, the college again gave up the ghost.

In order to keep the charter, the President, old Colonel Ewell, went through the formality of enrolling one student a year. Then, he would come in from his farm, ride up to the campus, tie his horse to a tree and, climbing the steps of the Wren building to the bell rope, give it several pulls. Mournfully the bell clanged to announce that the college was 'in session.' Colonel Ewell would go sadly down the steps and all was silence on William and Mary campus for another year. As a newspaper put it, 'the college halls were left

again to the bats and the echoes."\(^{13}\)

This picture of a deserted campus remained accurate until 1888 when yet another attempt at restoration was made. The college endowment of thirty thousand dollars had been preserved by President Ewell. Newly appointed President Lyon Gardiner Tyler, son of President John Tyler, worked to renew the "five badly burned buildings, and a weedy, unkempt campus of twenty acres."\(^{14}\) Of William and Mary, Stevens wrote, "...the town was as dead as Pompeii, but there was still a great tradition, and there were those, as Webster said of Dartmouth, who loved it." The Commonwealth appropriated enough funds to repay the college for its wartime losses and hire five professors and the president. Beginning in 1888, the General Assembly made an annual grant to the college of $10,000 to "educate male students for the profession of teaching."\(^{15}\) Even with this annual grant money, "it had a desperate fight to keep going until, in 1906, it was transferred to the state."\(^{16}\)

\(^{13}\)Ibid., p. 259-260.

\(^{14}\)Ibid., p. 261.


\(^{16}\)Stevens, op. cit., p. 261.
Just twenty two years later, Davis Paschall entered the College in the fall of 1928. "His [high school] history teacher, Ashton Ozlin, a graduate of William and Mary with an appreciation for the great traditions of the College, encouraged his student to follow in his footsteps."\(^{17}\) Paschall worked his way through the College, serving faculty tables and developing his political skills. On many occasions, Paschall waited on the President of the College, J. A. C. Chandler.\(^{18}\) Paschall recalls:

There were so many outstanding persons who dined with him, and I was privileged to meet them and hear the delightful repartee, discussion of political events, the needs and potential appropriations and gifts for the College. Dr. Chandler was a master in articulating the needs and interpreting the traditions of William and Mary. It was clearly manifest to everyone that he had a deep love for the College, and he imparted it artfully, sincerely and with distinctive success.

I recall his hosting about ten members of the House Appropriations and Senate Finance Committees. He entertained them with interesting stories about the College's history and the great promise it had for Virginia. In a somewhat veiled, but very impressive manner, he revealed the support needed by the College to fulfill its mission for the Commonwealth. After partaking of a sumptuous meal, one of the senators


\(^{18}\)This President Chandler, Julian Alvin Carroll Chandler is the father of Vice-Admiral Alvin Duke Chandler that was mentioned in Chapter IV, Part I. J. A. C. Chandler and Alvin Duke Chandler have the distinction of being father-son Presidents of the College of William and Mary. Approximately 30 years separates their tenures. Paschall served under both of these men, once as a student, once as a campus president.
said, 'Dr. Chandler, if the College can provide meals like this it hardly needs the financial support you talk about!' Dr. Chandler replied, 'Senator, we anticipated your visit and saved up because we knew you deserved the best, just as the College does.'

Later, Chandler helped Paschall acquire a scholarship and young Pat landed a new job, working as the first evening clerk for the Williamsburg Inn. Paschall also earned a membership in Phi Beta Kappa and a degree in history before graduating from the College in 1932.

From Chandler, he had learned lessons of politics and human relations. And from his clerkship at the Inn, he learned the feel and traditions of the community and the people who embodied them. In the challenges that would face him later in life, these experiences provided invaluable insights into the affairs of government, an appreciation of people from all stations in life, the joy of challenging work, humor, the practicalities of getting along under difficult times, and the value of cultivating the 'common touch.'

In 1938, after several summers of graduate work in Williamsburg, Paschall earned his Masters Degree in education from the College. During those years, Paschall worked as a teacher and an administrator in Virginia public schools. He completed successful military service as a communications officer during World War II, and in 1945, Paschall joined the Virginia State Department of Education. The next twelve years of service in this department culminated with his appointment as State Superintendent of

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19 Kale and Smith, p. 4.
20 ibid, p. 6.
Public Instruction in 1957. He served during the crisis of desegregation in Virginia to "keep the lamp of learning burning."\(^{21}\)

No man had had such a spectacular rise in the role of leadership in public education, or held more top positions in the state department of education. Still, when the call came for him to return to his beloved William and Mary as President in 1960, it was an offer he couldn't refuse, an opportunity to return to his alma mater.\(^{22}\)

When Paschall returned to the campus in 1960, what type of conditions greeted him? The conditions were certainly not those of a beautiful, prosperous campus like the one that decorates Williamsburg in the 1990s. Consider the following excerpts from the Kale, Smith history of Paschall's leadership. This list partially documents exactly what the new College president had to work with in the fall of 1960.

When Paschall became president of William and Mary in 1960, he faced the most acute crisis in facilities since the burning of the Wren Building during the War between the States. Enrollment had more than doubled since 1934, but no new classroom buildings had been constructed. For instance:

* More than half the library holdings were in five storage areas on campus.

* Mathematics and physics classes were taught in three Quonset huts and in the ends of maintenance warehouses.

* The biology department was jammed in the basement of

\(^{21}\)ibid., p. 8.

\(^{22}\)ibid., p. 8.
Washington Hall, a classroom budding.

*The Marshall-Wythe School of Law was housed in the basement of a men’s dormitory.

*The psychology department was crammed in the attic of the historic Christopher Wren Building.

*The chemistry department was located in the dilapidated quarters of old Rogers Hall with its exposed pipes and the dangers of explosions.

*The newly established geology department was housed in the basement of a men’s dormitory.

*Women’s physical education was housed in the basement of Jefferson Hall, built in 1925 and the oldest women’s dormitory on campus, where the swimming pool was so small as to be termed, "the bathtub."

*Men’s physical education was in old Blow Gymnasium, a building constructed in the 1920s. It had a substandard pool, an inadequate indoor track, and a basketball area so small that spectators were crowded into bleachers dangerously close to the playing floor.

*The Reserve Officer’s Training Corps (ROTC) was squeezed into the basement of Blow Gymnasium, which was viewed by Army officials as the most inadequate college accommodation on the East Coast.\(^2\)\(^3\)

More details appear in the book about the drab, run-down and over-crowded conditions of the College when Paschall took office; in sum, the new president saw a critical need to improve his institution.

After surviving nearly two centuries of desperate conditions, the college was still struggling to tread water.

Kale and Smith report:

When Governor Almond and his budget committee visited

\(^{23}\)Kale and Smith, op. cit. p. 91-92.
the College while touring state institutions in 1961, he took President Paschall aside and said, 'Pat, don't show us anymore of these desperate needs. This committee might decide that it's better to close up this place than to try to fix it!'\textsuperscript{24}

Not only did Paschall face a buildings and grounds crisis, he also faced the "Colleges of William and Mary System" that had been instituted a few years earlier by the State Council in an effort to centrally coordinate all of the College's branch campuses. The story of the "System" is well documented in the Kale and Smith book. Briefly, Paschall was able to convince McFarlane [at this time, prior to VARC, McFarlane was Director of SCHEV] and the rest of the Council that the Colleges system was not in the state's best interests. In early 1962, months before an official VARC agreement was signed, the State Council recommended that "System of the Colleges of William and Mary" be officially dissolved. Paschall's mode of operation and his deep seated love for the College warrant consideration:

I feel a deep concern in realizing that all real and personal property of William and Mary had been transferred to the system. This, somehow, seems to me to be selling a birthright for something unknown in substantive definition... I am concerned about the legislative provision that the governor may appoint Visitors from a list of qualified persons submitted by the alumni associations of the Colleges of William and Mary. With exception of the ancient College of William and Mary, there are no such alumni associations, and I can envision problems eventually as to alumni of other institutions in the system claiming to be graduates of

\textsuperscript{24}ibid, p. 92.
the College of William and Mary. For example, the Norfolk College, only now attaining four year status, is designated 'The Norfolk College of the College of William and Mary of the Colleges of William and Mary!' I [also] am concerned that the long-time seal of William and Mary, bearing its royal Coat of Arms, is, in effect, supplanted.

Paschall did not reveal these concerns publicly because he recognized that the system was then a fait accompli, and such a revelation would invite justifiable criticism of 'not giving the system a chance to work.' The situation required adroit moves by Paschall, who said later, 'I admit that although I detested the ideology of Andrei Gromyko, the Soviet diplomat, I admired his strategy, a combination of constructive ambiguity and flexible response. I employed that strategy from time to time during those months.'

Paschall successfully implemented this "constructive ambiguity and flexible response strategy," not only with the dissolution of the Colleges of William and Mary System in 1962, but also with the dissolution of the VARC consortium in 1967. Chapter IV revealed Paschall's additional strategy of "going around the flanks of the enemy, rather than confronting him head on." The Kale and Smith book presents many examples of Paschall's political wisdom. This final excerpt contains a description of Paschall's smoothness; it refers to the 1961 visit by Governor Almond and his budget committee which was described previously.

Paschall, who had been reappointed state superintendent by Governor Almond and had worked closely with the committee members in his former role, took the group into the Great Hall of the Wren Building for a

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25 ibid, p. 73-74.
sumptuous meal.

During that visit, Paschall, utilizing his history background and his politician's flare for oratory, reminded the legislators that they sat on 'hallowed ground—where Jefferson moved and had his being as a student and where Marshall, Wythe, Monroe, the Randolphins and others of the Founding Fathers were inspired to pen the great documents that undergird this Republic; where Washington received his first badge of office, a surveyor's license, and his last as the first American chancellor of William and Mary.'

L. M. Kuhn, then state budget director, told R. T. English, bursar of the College: 'That man, Paschall, has done it again. This crowd will now go down the road and talk about that old Virginia ham, crab cakes, and spoon bread he fed them, and about all that history business. They will help him. You can count on it.'

Kuhn's prophecy proved accurate. During Paschall's presidency, 1960-1971, the General Assembly would approve more than $44 million for facilities, equipment, and landscaping at William and Mary. At that time it was the largest accumulated state support in the history of the College.26

President Paschall employed his political skills in out-maneuvering the enemies of his beloved College. This approach included his response to a graduate degree-granting program at VARC offered by the University of Virginia.

The University was founded in Charlottesville (1819) by a famous William and Mary alumnus, Thomas Jefferson. Jefferson had wanted to transform his alma mater into Virginia's first State University and expand on its traditional, classical curriculum. When the State Legislature refused, Jefferson decided to erect another

26 ibid, p. 92-93.
institution near his home in Monticello. Since its inception, there has always been a rivalry between the University of Virginia and its predecessor, the College of William and Mary. After having read through the brief history of the College and Paschall’s relationship to it, perhaps now the reader can partially grasp what must have concerned Paschall when VARC was proposed: He was confronted with the distinct possibility that UVA could supplant William and Mary’s hopes to become a graduate institution by offering UVA degrees at VARC. VARC’s location was less than 20 miles from Williamsburg.

Did Paschall see Virginia Tech as an equally threatening institution? Probably not, considering the partnership that allegedly formed between Paschall and VPI president, Marshall Hahn. VPI, established in 1872 as one of the State’s Land Grant colleges, was the largest and the youngest institution in the consortium. VPI had notable graduate programs established in science and engineering, but they placed second to UVA in prestige and status in the Commonwealth. As previously mentioned, Marshall Hahn had ambitions for his institution. The notion that Hahn joined forces with Paschall to keep UVA from extending its influence to the Tidewater region of the state has been described in previous chapters. Hahn’s specific motivations and specific contributions remain unclear, with the
exception of the Strother interviews documented in Chapter IV.27

The conclusion of the matter? The factors that made VARC attractive to all three of the colleges—favorable publicity, increased funds, better faculty, larger physics departments, increased laboratory capacity—very likely would have strengthened the two well established institutions, UVA and VPI. However, William and Mary, from its recently described status as the weakest of the three schools, was in real danger of being run over by these other institutions in its own backyard. Two independent interviews attest to this situation. John Duberg, formerly of NASA, recalls:

William and Mary was nothing then, and not only was it nothing then, it was intended to be nothing. Because of UVA and some other politicos who didn’t want it to be any bigger than it was...28

Robert Siegel, William and Mary physics professor, remembers the antagonism between UVA and the two other institutions:

Shannon and UVA tried to take it [VARC] over at one point, tried to offer everything from physics to engineering. Paschall and Hahn [were] operating together and had a common interest, but Paschall saw it not just as a matter of obstruction on his part—he

27See pages 70-72, Chapter IV Part I and Footnotes 18 and 19. As previously noted, one gap in this oral history is that Marshall Hahn refused to be interviewed for this case study.

28Duberg, op. cit.
could never just protect William and Mary's interests—but to survive, he had to use the opportunity to strengthen programs of William and Mary so that they would negate the need for another institution down here.29

...the only way he could prevent UVA from taking over graduate education in this area was not to just be wily and chose VPI as an ally to help defeat them, but that William and Mary had to change, had to build and change with what was happening. I think that was pretty unusual (while his natural instincts were as a politician in this area), that he recognized that this institution, which he knew and loved, had to change—that was the way to preserve it—pretty remarkable.30

Earlier, in Chapter IV, it was noted that Paschall said, "It was a time of empire building, if you didn’t do what you had to do, you wouldn’t survive."31 Siegel remembers when the VARC reorganization came down from the Governor’s office in 1967, "...they all thought it had been the result of political scheming on the part of Dr. Paschall to gain control."32 Paschall was struggling to establish a new William and Mary identity in an age of the modern

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29Siegel, op. cit. See also, UVA Proposal, circa 1961-62, to have the cyclotron managed completely by UVA, on UVA property. Proposal located in Thompson files, NASA-LRC, Department of Correspondence and Records Management, LAFB, Hampton, VA. Copy of UVA proposal located in Appendix G. Also note, previous to the VARC years, common wisdom in Virginia referred to UVA as "The University." See Virginius Dabney's Mr. Jefferson’s University: A History.

30ibid.

31Paschall interview, op. cit. See also, Kale and Smith, p. 143.

32Siegel interview, op. cit.
university. He was not about to let the second oldest college in the country sink further into obscurity during his watch. Had Paschall not employed his political connections and his political astuteness, the College of William and Mary may have been relegated to a permanent post as a mediocre, under-funded undergraduate college in Virginia during the age of the university.

Successful Consortium?

Chapter II disclosed many characteristics of successful consortia. Which of these, if any, did VARC possess during its lifetime from 1962-1967? Glazer described an ideal consortium as having "academic complementarity, joint long-range planning, a willingness to take risks, a central budget, a strong individual to spearhead activities, and sufficient esprit de corps to overcome institutional rivalry." Where did VARC fall out along these Glazer observations? It did not exhibit any of the characteristics of an ideal consortium except a central budget, which was provided by NASA.

In addition to the characteristics of strong, effective leadership and incremental planning, Mark Poland offered four other attributes of successful consortia: Clear, concise goals; open, two-way communication; the support of

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33Glazer, op. cit., 192.
member presidents; and the consortium’s perception of being useful to all members. VARC had clear goals on paper, but in practice, only one of the three individual institutions actually supported the consortium goals. VARC never managed to achieve open, two-way communication. For example, one president and the VARC director were entirely surprised by the VARC reorganization in 1967. The VARC consortium did not sustain the full support of all of the member presidents, as the Paschall-Hahn partnership will attest.

Finally, the consortium was perceived as useful to all members because they each saw the opportunity to bolster their own institutions. The consortium’s usefulness ended when the possibility existed that VARC could usurp the identity and function of one or more of the member institutions, i.e. by offering graduate degrees on the Peninsula, potential Hampton Roads graduate students probably would elect to attend VARC over William and Mary, VPI, or UVA. For UVA this potential was not intimidating, they actively sought the right to grant UVA degrees at VARC. Why did VPI and William and Mary not seek the same opportunity? Perhaps because the two less powerful institutions did not want to have to compete with the more powerful UVA. Or, perhaps they believed that potential students would prefer a degree from UVA.

Can successful business and industry consortium...
characteristics be found in the VARC venture? What of the Ford-Mazda keys to successful partnerships that were listed in Chapter II? VARC's lack of the seven keys has already been discussed in either Chapter IV or the present Chapter. Briefly, they are: 1. Keep top management involved—often, the VARC directors and at least one member of the executive committee were not involved in decision making. 2. Meet often and informally—the formal executive committee meetings usually took place every month or bimonthly, and apparently were supplemented with covert meetings or conversations which were used to set overall direction. 3. Use a third party to mediate—the meetings were closed to everyone except the member presidents and the director, who had no real mediating authority.

The remaining keys, 4 - 7: Maintain the independence of all parties, allow no sacrifice deals, maintain overall balance among members, appoint a primary monitor for all aspects of the alliance, and stay flexible in anticipating cultural differences—were not found in the VARC consortium. Had these keys to successful operation been in force, perhaps William and Mary would not have had to resort to behind the scenes maneuvering. Clearly, the VARC consortium did not follow the majority of guidelines for successful partnerships found in the literature review.
Failed Consortium?

To what extent did the VARC episode demonstrate the characteristics of a failed consortium? In the Review of Literature, lack of funds (or the lack of an adequate funding policy) appeared as one of the nine Offerman characteristics of failed consortia. Did the VARC consortium fail because of a lack of funds? Evidence from the interviewees says "no." In fact, NASA fronted the lion's share of funds for the entire venture. The only part of the consortium-SREL complex that was funded by the state was the VARC building. The federal government donated the land and NASA funded the laboratory. NASA also provided each of the three institutions with substantial grant money to build up their physics departments. The State Council used the lack of state funds as an excuse not to allow UVA the right to grant degrees from the VARC site in 1967, but was state funding a true factor in VARC's failure? No, because in view of Paschall and Hahn's partnership, the funding question becomes moot.

Which of the other eight Offerman characteristics of failed consortia did VARC possess? All of them. In fact, VARC demonstrated all of the nine Offerman characteristics of a failed consortium. VARC lacked sustained institutional

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34 Offerman, op. cit., p. 143. See also Offerman's characteristics of failed consortia in Chapter II.
commitment and support from at least two of its three original members. Though VARC contracts specified a clear mission, two of the three participating institutions did not agree with or fully support an essential part of that mission (granting graduate degrees); so in a real sense, there was a lack of mission clarity. There were definitely inadequate organizational structures, as no safeguards were introduced to protect weak members. There was ineffectiveness as a graduate education consortium, though the success of the research part of the mission helped to make the individual institutions more effective in physics research. There was a clear lack of formal leadership and a lack of community support—the national physics community did not support SREL and the local business support was probably stymied by the William and Mary/VPI agenda for VARC. This study has demonstrated the fear among some members that the consortium could evolve into an important institution in its own right, usurping power and prestige from the members themselves. The study has also demonstrated that VARC exhibited Offerman's lack of member complementarity, i.e., the perception that one member could stand to benefit more than another, or perceived inequalities in distribution of rewards.

Summary of Conclusions

VARC demonstrated more of the characteristics of failed
consortia than it did characteristics of successful consortia. However, success was achieved for the individual members, especially for the weakest member, the College of William and Mary. The VARC consortium became a means to an end. Though VARC fell victim to circumstances, William and Mary survived and prospered, as did UVA and VPI. All three schools continued to achieve significant growth in their physics departments and all three now enjoy a greater measure of national prominence.

Ironically, in the 1980s, the three schools joined another physics related consortium to manage a different federal laboratory, one which stemmed partially from the VARC-SREL arrangements. A research-industrial park eventually began to take shape in the late 1980s on the land purchased for the park during the VARC years. On the VARC idea, NASA lost out; but, it later managed to gain the graduate education it had sought from George Washington University. Even later, Old Dominion University [Formerly, the Norfolk branch of the College of William and Mary which was spoken of in an earlier segment] formed a teleconferencing arrangement with UVA and VPI.35

Though no one will ever know what success VARC might

35See Epilogue. See also a forthcoming dissertation from the College of William and Mary, subject: The Peninsula Graduate Engineering Center by Mary Stout, expected publication date December 1993.
have achieved had there been a more sincere attempt at cooperation, all was not lost. Approximately 20 years later, there emerged from the VARC/SREL "ashes" a phoenix of sorts in the form of a new consortium and a new federal laboratory.36

Implications of the Study

For those who are interested in learning how consortia work and how they are best managed, this history of VARC's saga tells a great deal. In order to have a successful consortium, leadership needs to be strong and effective. VARC vested its leadership in an executive committee composed of three rival college presidents. Should NASA administrators have been more aware of college lore and tradition, they might have known that this executive committee arrangement would not work. Common sense says that a three-headed operation is doomed to be forever tugged in three different directions. The VARC scenario describes this exactly as Siegel recounts in his interview: "It's just that they all had different goals. It's another principle, all men mean well,...but they had different objectives."37

VARC's directors had limited powers, always subject to

36See forthcoming publication on the history of the Continuous Electron Beam Accelerator Facility, written by Michigan State University's Catherine Westfall.

37Siegel interview, op. cit.
the executive committee, having no real or decision making authority. Effective, strong leadership must come from impartial, third parties who have no vested interest in the individual consortium members, but rather, have a vested interest in the success of the consortium. If a consortium has a chance for success, the leadership must have real power and decision making, policy making authority.

To safeguard consortium members, governance structures should be set-up to protect the weaker members from being dominated by the stronger ones. In this sense, the VARC consortium's executive committee governance allowed one president to access the safeguard that he needed, by forming an alliance with a fellow committee member. But what of other consortia whose weaker members may not have a politically powerful leader to protect them from dominant members? A successful consortium must find a way to protect the weaker members and insure that the stronger members do not exert disproportionate influence. Some system of checks and balances is needed to assure each institution a level playing field.

In addition, a healthy consortium must not threaten the prosperity and distinctive function of the individual members. The VARC consortium, if it had been successful, may have kept William and Mary from developing into the university that it has become over the last 30 years. For
example, VARC had no built in safeguards to protect its weaker member from the more powerful UVA. The other two presidents had to take matters into their own hands, so to speak. This inevitably killed the consortium and left some question about the ethical considerations of their methods. For genuine success, a consortium must try to foresee weak areas and circumvent problems that could arise in those areas.

The VARC agreement entailed the establishment of graduate programs leading to degrees from the participating institutions on the VARC site. One hypothesis says it was unsuccessful because of residency requirements of the institutions. As Dr. Gotow mentioned in his interview, the consortium seemingly failed to consider the residency requirements of the institutions before signing such an agreement on graduate degrees. But did they? The NASA people interviewed for this study (Duberg and Butler), the Times-Herald investigatory reports after the re-organization (see Appendix E), letters from legislators and the business community (see Appendix F), and the interview with Edgar Shannon all say that in fact, there was an "understanding" among the three colleges that this residency requirement would be waived.

On this crucial issue, the consortium failed to achieve consensus on paper. The presidents agreed, using the
"constructive ambiguity and flexible response" strategy, but they did not agree in writing. The colleges were supposed to have made special petition to the Southern Association of Colleges and Schools accrediting board for permission to grant degrees from classes offered strictly from the VARC site. There is no record that they did this and after the reorganization, the State Council and the Governor’s office used this residency requirement of the Accrediting Board to imply that VARC never had any intention of offering graduate degrees on site.38

Every facet of a consortium agreement should be specified in a legally binding contract which is signed by all members. This seems especially important for government or other agencies who contract with consortiums for particular services. Had NASA relied on a legally binding contract for this waiver of residency requirement, they might have protected themselves from some of the disappointments that came after the 1967 reorganization. Instead, NASA relied on the informal, "gentleman’s agreements" between friends in 1962; and in 1967, William and Mary’s president promised Thompson that a "full complement of graduate courses will be offered in the fall

38Barnes, op. cit.
of 1968. The full complement of science courses never materialized. By the fall of 1971, William and Mary offered lots of courses, but they were in Business and Education, not science. Again, the implication is to get every detail of the agreement in writing, up front, and have it checked thoroughly for possible legal loopholes.

Every consortium should face the possibility of hidden agendas. Consortium leadership should acknowledge that individual members will try to protect their own interests. The challenge of good consortium governance would be to protect the members' interests, while simultaneously promoting the interests of the consortium. Both individual members and the consortium as a whole should prosper from the association. Real efforts should to be made to obviate the need for hidden agendas, especially those like the VARC scenario where one institution had to fight for its welfare. A successful consortium would not usurp the identity of its individual members, nor put them in danger of extinction.

**Summary of Implications**

A consortium must insure strong, effective leadership.

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39ibid.

40For instance, Spring 1971 enrollments at VARC were: Applied Science, 29 part-time students enrolled in 7 courses; Engineering, 59 part-time students enrolled in 9 courses; Business Administration, 114 part-time students in 5 courses; Education, 304 part-time students enrolled in 13 courses. Source: Thompson VARC files, op. cit.
Consortium leadership must have adequate power and authority to enact policy and make decisions. The leadership must have a vested interest in the success of the consortium, yet be able to maintain the prosperity of the individual members. Adequate governance structures need to be in force to insure a system of checks and balances among members. These governance structures should be designed to protect the weaker members from dominance by the stronger members. Those agencies or institutions that contract with a consortium for a particular service should require a legally binding, formal contract that discloses every facet of the consortium agreement. The potential for hidden agendas rooted in self-interest needs to be acknowledged and guarded against throughout the life of the consortium.

Recommendation for Further Study

Recommendations for further study can be divided into three broad categories: State coordinated systems of higher education; hidden agendas in other consortia; and a comparison of VARC with newer consortia such as the one located on the Virginia Peninsula, the Southeastern Universities Research Association, SURA. In addition to these broad categories, the researcher would like to recommend that Marshall Hahn be interviewed on some occasion to verify or contradict the rationale behind his involvement with the VARC consortium that has been presented in this
study.

Higher Education Coordination Systems

What can the Virginia state system of higher education learn from the VARC scenario? If Virginia wanted to participate in a technological adventure with NASA, if it truly wanted to take advantage of the vast laboratory facility that existed and still exists on the Hampton Langley site, then perhaps a centrally governed, state-wide university system should be considered. That old Virginia conservatism may get in the way of progress, but it could be overcome under the right set of conditions.

Limited financial resources may force the Commonwealth to consider some similar alternative for its state-supported institutions. In the NASA-SREL case, a centrally governed state system may have been preferable to the three-headed consortium of VARC. The researcher would recommend that the State Council or other interested party undertake a comprehensive study of effective state university systems of higher education (such as is found in North Carolina or California) to draw comparisons and contrasts between those systems and the Virginia system of independent institutions.

Hidden Agendas in Other Consortia

VARC's failure may partially be due to a latent agenda, a fairly elaborate and involved system of political workings that functioned beneath the surface of publicized events.
How many other consortia carry this same phenomenon as a potent agent of destruction? A hidden agenda can be compared to the function of a virus. A virus can either go into a cell and destroy it immediately, or it can lie dormant, waiting until conditions are more favorable for viral reproduction and then actively destroy its host. The viral analogy has been used by the computer industry for several years. A computer "virus" can sneak into a computer memory and destroy all of the contents. Some of these computer viruses use triggering devices such as the infamous Michelangelo’s birthday virus of 1992. Computer software now includes various virus detection programs, designed to seek out and destroy any latent viruses the computer hard-drive may have acquired.

Carrying this virus analogy to consortia: Do apparently successful consortia have a latent agenda waiting in the wings, as the alleged Paschall-Hahn partnership waited over five years to emerge as a real threat to the VARC consortium? Have other failed consortia been "killed" by hidden agendas? It may be well worth the effort involved for those who are financially backing a consortium to investigate their membership, looking for hidden agendas and potential triggering devices. Hereafter, in business and industry and in higher education, complete studies of failed consortia should always include an investigation for
possible hidden agendas. In consortia operations, as previously mentioned, care must be taken to protect the weaker members from the stronger ones, so that a fight for survival should not be necessary.

**VARC and Other Consortia**

Are there any VARC "ghosts" lurking in the new SURA consortium? The Department of Energy executives, responsible for funding the SURA project in Newport News, may want to take a hard look at this VARC study and determine now what, if any, VARC problems could arise in the SURA consortium. The SURA organization should find the weak areas of their consortium and work to strengthen them. They should be aware of the VARC study and make efforts now to insure that a hidden agenda does not arise from a weak link in the SURA alliance, one which could potentially destroy the consortium.

In 1993, the Department of Energy has another very expensive consortium, the University Research Association (URA) in Texas which manages the construction of the Super- Conducting Super-Collider Laboratory. The DOE and the URA may want to take note of the VARC analysis. The researcher recommends that all state and federal agencies which fund consortia run independent analyses, looking for the characteristics of failed consortia and for hidden agendas. In 1993, both of the previously mentioned DOE funded
consortia reportedly experience problems now, before construction has been completed at either site. The Department of Energy could conceivably find itself like NASA did in the late sixties, wondering what went wrong with such a seemingly brilliant potential. The costs have escalated, instead of sinking millions of dollars into a consortium, the DOE is sinking billions of dollars into the two consortium-managed projects. The ordinary taxpayer could lose even more of his hard earned wages if government does not get on top of consortium problem areas. Monetary considerations alone demand more research into the operation of all present and future federally and state financed consortia.

Summary

One pivotal point of this investigation has been the unexpected finding of a hidden agenda. Perhaps the hidden aspects of organizations pervade and literally control society. Academicians should acknowledge that un-seen political struggles definitely occur and that they influence even the purest of characters. Self-interest should be taken as a given in any collective endeavor. Though the promise of individual reward may empower initiative and extraordinary effort from participants, the self-interest should not be left un-checked. As this study has demonstrated, uncontrolled self-interest can destroy an
entire project. Conversely, strong, effective, perceptive and well-informed leadership could potentially harness the energy of member self-interest for the good of the whole consortium. Higher education should investigate these types of phenomena, not only in consortia and state systems, but in individual institutions as well.\footnote{See Rebecca S. Lowen’s analysis of the Stanford Physics Department evolution: "Transforming the University: Administrators, and Industrial and Federal Patronage at Stanford, 1935-49," \textit{History of Education Quarterly}, Vol. 31, No. 3, Fall, 1991, p. 365ff.}

Maybe the researcher was lucky enough to have initiated this investigation at a time when VARC participants were still alive, or maybe a glimpse of the truth would have been apparent between the lines of old documents, whatever the case, the journey has been invigorating and worthwhile. Many of the needs for this type of qualitative research (presented in Chapter I) have been addressed with this historical study. Future generations of historians could profit from this investigation and its lessons. Current consortia participants and backers can draw on this study to initiate their own investigations. What other secrets wait to be discovered beneath the surface of current and historical events?
EPILOGUE

Less than six years after the VARC reorganization, NASA withdrew financial support from the SREL laboratory. For a time, the SREL operated with funds from the National Science Foundation, but according to local news reports, the laboratory closed in 1978. Hans Von Baeyer, a physics professor from the College of William and Mary, became the VARC director in July, 1979. Together with University of Virginia physicists, Von Baeyer campaigned for a new accelerator facility to replace the outmoded SREL. Von Baeyer and his colleagues formed the Southeastern Universities Research Association (SURA) consortium in August, 1980, "for the purpose of conducting scientific research." The original consortium incorporators were the College of William and Mary, the University of Virginia and Virginia State University. Later, several Virginia institutions joined the consortium including Virginia Polytechnic Institute and State University.

The SURA consortium proposed a new accelerator design to replace SREL’s obsolete proton accelerator. This time, the federal funding agency was the Department of Energy. Once again, a heated controversy erupted within the physics community over where the new facility would be located. A huge, widely publicized struggle ensued between SURA and
Argonne Laboratory as they each fought to win the contract for the Department of Energy’s new laboratory. The SURA consortium won the contract and acquired the federal property that once belonged to NASA. The accelerator facility (CEBAF) is under construction in 1993 on the site of the former VARC/SREL in Newport News, Virginia. The construction project managers anticipate completion by 1994. NASA’s hopes of a large science center may be partially realized by the new accelerator facility—albeit, NASA is not the contractor.

Under William and Mary’s management, the VARC building eventually became the home of teacher, business, and continuing education courses. The graduate science education function deteriorated rapidly. According to one report, the graduate science enrollment peaked in 1967 with 70 students. In 1968, VARC science enrollment dipped to less than 40 students. NASA finally gave up on VARC fulfilling its graduate science education function. In 1968, NASA-LRC accepted an offer from George Washington University to come to Langley and initiate degree programs. The graduate education NASA acquired through George Washington University allowed NASA employees to earn their

\[^{1}\text{NASA draft document, "Virginia Associated Research Center," located in F. L. Thompson’s VARC files, NASA-LRC Correspondence and Records Management Section, LAFB, Hampton, VA.}\]
degrees without leaving the Peninsula. Old Dominion University became actively involved in NASA's engineering needs and currently (1993) the Old Dominion Graduate Engineering Center successfully operates with video teleconference courses from universities all around the state, including UVA and VPI. According to NASA's Department of University Affairs, Langley now has multiple graduate offerings from institutions around the nation on site. George Washington University still plays a significant role in Langley Research Center graduate education.

The educational growth at NASA-LRC seems to have happened in spite of William and Mary's and the State Council's efforts to impede it. To examine the details of the NASA struggle to bring graduate science education to the Peninsula, please consult Appendix E and Appendix F at the end of this paper. Appendix E contains news articles that cover an investigation of VARC after the 1967 reorganization. The articles are well-written and need no editorial comments. Appendix F contains some of the correspondence that was discovered in the Thompson files regarding the many complaints that William and Mary and the Governor's office received after the reorganization of VARC.

This study of VARC closes with one final excerpt from a Floyd Thompson memorandum, Draft dated May 15, 1968 and found in the Thompson VARC file, NASA-LRC Correspondence and
Records Management Section, LAFB, Hampton, VA. Thompson had just visited Governor Godwin in Richmond, accompanied by the entire legislative delegation from the Peninsula, where they had discussed the crisis at VARC. After returning from this meeting in Richmond, Thompson writes:

Mr. McMurray reviewed the general history and background events covering the entire history of VARC up to the present. He pointed out that the reorganization of 1967 had solved the administrative problem at SREL, but had not provided the basis for resident graduate education at VARC, and that it was the concern about this aspect of the entire project that brought about the meeting.

In summarizing the cost of the venture, Mr. Bateman indicated that the state of Virginia has actually been required to put very little money into the program in comparison with the federal investment and the value of the program.

About this time, the Governor took over the discussion and said in effect, that he was familiar with all these arguments but that he was greatly concerned with any attempts to provide full residence credit at VARC. The Governor pointed out that the presence of the Council of Higher Education in the current situation was at his request to provide him with guidance and help in dealing with the problems. It was clear that any help that the Council has been able to provide has not given him an adequate understanding of the many factors involved in this educational problem.

The impending entrance of The George Washington University into this area with a graduate residence program in engineering leading to master's degrees was brought into the discussion. I stated that our most recent information indicated that they were prepared to embark on this program in September of this year. The Governor stated he had information indicating that this would not happen. Such a statement, of course, implies that he is aware of a move with which we are not acquainted, to prevent the entrance of the George Washington University with such a program into this area. The thought that the administration of Virginia
is against Virginia colleges giving full residence credit in engineering at VARC, and in addition, may be party to an attempt to block any other college from giving full residence credit in this area is very disturbing.

Under pressure of the argument that ensued during this discussion, the Governor finally stated that he would have no objection to the University of Virginia giving full residence credit at VARC if they are prepared to do so without the introduction of non-technical courses not now offered [sic]. This point arose because it had been stated that the University of Virginia saw no reason for withholding from giving full residence credit for degree work at VARC.

In summary, I must state that the position assumed by the Governor represents a reversal of attitude of the state administration toward the development of higher education at the graduate level. This comes as a shock to all those in this area who had been led to believe [sic] and had worked so hard to create a much needed capability for graduate education in this area and in the state as a whole.

Whether or not the situation can be salvaged wholly or in part by forthright action by the University of Virginia, and success on the part of The George Washington University in installing their graduate program in this area, remains to be seen. It is clear that any success in developing the program now will not come as a result of help and assistance from the administration of Virginia, from the Governor’s Office, or from the Council on Higher Education. It can only be hoped that they will not interfere with the development of this program, which is so badly needed in this area.
### Table I. ARCHIVAL DOCUMENTS USED FOR THE STUDY

<table>
<thead>
<tr>
<th>ARCHIVAL DOCUMENTS</th>
<th>Description</th>
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<tbody>
<tr>
<td>NASA</td>
<td>1960-1971, various pieces of correspondence between Director Floyd Thompson and VARC participants, original VARC prospectus, VARC dedication ceremony memorabilia, interoffice memos from NASA staff, personal files of Floyd Thompson regarding VARC reorganization, news articles and news releases, news articles of post VARC developments</td>
</tr>
<tr>
<td>UVA</td>
<td>Papers of Edgar Shannon, Jr. (President), minutes of VARC governing committee meetings, correspondence from Klaus Ziock, acting VARC/SREL director, VARC quarterly reports</td>
</tr>
<tr>
<td>VPI</td>
<td>Notes taken from Warren Strother's on-going biographical study of VPI President Marshall Hahn, Hahn letter from VPI archives, several pieces of Hahn correspondence found at other archives</td>
</tr>
<tr>
<td>W&amp;M</td>
<td>Papers from President Paschall's files, interoffice memos of Paschall and various physics professors, news articles from local and regional newspapers, VARC minutes, VARC budgets, VARC quarterly reports</td>
</tr>
<tr>
<td>VA State Archives</td>
<td>Papers and records of two Virginia Governors who were involved with VARC, Albertis Harrison, Jr. and Mills E. Godwin, Jr.; official report of the Oyster Point Steering Committee on Research Park development at VARC/SREL (1967); General Assembly House Bills for VARC creation and dissolution</td>
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Table II. INTERVIEWEES FOR THE STUDY

<table>
<thead>
<tr>
<th>Organization</th>
<th>Name &amp; Title During VARC Early Years (1962-67)</th>
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<tbody>
<tr>
<td>NASA</td>
<td>John E. Duberg, Technical Assistant Director to Associate Director</td>
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<td></td>
<td>T. Melvin Butler, Administrative Director</td>
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<td>UVA</td>
<td>Edgar F. Shannon, Jr., President of the University</td>
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<td></td>
<td>Klaus O. Ziock, Professor of Physics, 1st VARC/SREL Director</td>
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<td></td>
<td>Piet C. Gugelot, Professor of Physics, 1st permanent SREL Director</td>
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<tr>
<td>W&amp;M</td>
<td>Davis Y. Paschall, President of the College</td>
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<td></td>
<td>Robert T. Siegel, Professor of Physics, 2nd SREL Director</td>
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<tr>
<td>VPI</td>
<td>Kazuo P. Gotow, Professor of Physics, Research Scientist at VARC</td>
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<td></td>
<td>David A. Jenkins, Professor of Physics, Research Scientist at VARC</td>
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<td></td>
<td>Warren H. Strother, Director of Public Relations</td>
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<tr>
<td>Commonwealth of VA</td>
<td>Albertis S. Harrison, Jr., Governor 1962-1966</td>
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<td></td>
<td>Mills E. Godwin, Jr., Governor 1966-1970</td>
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<td>SCHEV</td>
<td>William H. McFarlane, Director of SCHEV, and 1st VARC Director</td>
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<td></td>
<td>Joseph E. Blackburn, SCHEV Member, Former State Legislator</td>
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<tr>
<td>Question</td>
<td>Yes</td>
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<td>-------------------------------------------------------------------------</td>
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<tr>
<td>1. Did the consortium leaders and institutions establish a consensus on</td>
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<td>the mission and purpose of VARC?</td>
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<td>2. Were cooperative efforts among the institutions participating in</td>
<td>2</td>
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<tr>
<td>VARC real, not token?</td>
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<tr>
<td>3. Did VARC have clear, concise goals?</td>
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<tr>
<td>4. Did each member president or CEO support the VARC Mission</td>
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<tr>
<td>A. in theory?</td>
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<tr>
<td>B. in practice?</td>
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<tr>
<td>5. Were all member institutions equally represented in the governance</td>
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<tr>
<td>of the organization and in practice, were all members able to exert</td>
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<td>equivalent influence?</td>
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<td>6. Was there community support for VARC and how was it manifested?</td>
<td>7</td>
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<tr>
<td>7. Was there open, two way communication among the institutions</td>
<td>4</td>
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<tr>
<td>belonging to VARC?</td>
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<tr>
<td>8. Did the consortium leaders engage in systematic, future-oriented</td>
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<tr>
<td>planning for the consortium?</td>
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<tr>
<td>9. During the period 1962-1967 when VARC functioned as a consortium,</td>
<td>0</td>
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<tr>
<td>was there strong, effective leadership?</td>
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<td>10. Was funding adequate to meet the goals of the mission?</td>
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</tr>
<tr>
<td>11. Were the organizational structures of VARC adequate to carry out</td>
<td>2</td>
</tr>
<tr>
<td>the mission?</td>
<td></td>
</tr>
<tr>
<td>12. Did you and your institution perceive the consortium as useful? i.e.</td>
<td>7</td>
</tr>
<tr>
<td>did you realize any benefit from participating in the venture?</td>
<td></td>
</tr>
<tr>
<td>13. Was there a fear on the part of member institutions that VARC</td>
<td>8</td>
</tr>
<tr>
<td>could grow to usurp their autonomy, identify and distinctive function?</td>
<td></td>
</tr>
<tr>
<td>14. Did each of the cooperating institutions develop a sense of gain</td>
<td>6</td>
</tr>
<tr>
<td>and strength by participation in VARC? (Your institution.)</td>
<td></td>
</tr>
</tbody>
</table>
APPENDIX B

ORIGINAL VARC PROSPECTUS

MAY 1, 1963
A Prospectus in Support of A Request

for

A Grant of Federal Surplus Land

submitted to

The U.S. Department of Health, Education, and Welfare

on behalf of

The Virginia Associated Research Center

by

The Commonwealth of Virginia

May 1, 1963
"Because of the seriousness of this problem (increasing Soviet scientific advantage) for the long-range future of the U.S., I have asked my Science Advisory Committee, in cooperation with the Federal Council for Science and Technology, to review available studies and other pertinent information, and to report to me as quickly as possible on the specific measures that can be taken within and without the Government to develop the necessary and well-qualified scientists, engineers, and technicians to meet our society's complex needs -- governmental, educational, and industrial."

President John F. Kennedy
The time has come when Virginia's graduate institutions of higher learning must respond in new and constructive ways to the mounting needs of our state and nation for increased scientific manpower and knowledge. Urban centers of technology, in particular, must have readier access to the Commonwealth's most advanced resources in science and engineering.

The Virginia Associated Research Center is a timely answer to these needs. It will bring to the Hampton Roads metropolitan area new opportunities for graduate training essential to technological progress. Its development will coincide with, and reinforce, a major expansion of research activities at the Langley Research Center of the National Aeronautics and Space Administration.

The progress of this forward-looking project is of vital interest to me, and its continuing development has the fullest endorsement of my office.

A. S. Harrison, Jr.
Governor of Virginia

The State Capitol
Richmond
November 9, 1962
SUMMARY

This prospectus supports an application by the Commonwealth of Virginia for 347.97 acres of surplus Federal land, situated within the Oyster Point Back-up Storage Area (Department of the Air Force) at Newport News, Virginia. The application is made on behalf of the Virginia Associated Research Center (VARC), an off-campus graduate facility, sponsored by three institutions of higher learning.

VARC is an answer to mounting demands in the State and nation for more high-level specialists and increased research, notably in aerospace science and engineering, and military and industrial technology. Its location in the Hampton Roads area, currently served by undergraduate colleges only, will stimulate advanced work in these fields through its close proximity to the Langley Research Center of NASA, to other extensive Federal installations, and to a growing center of technological industry.

VARC will specialize in applied aerospace research, basic research in several critical areas, and will develop graduate training programs related to these activities. Research activities will include operation of the Langley Center’s new Space Radiation Effects Laboratory. Graduate training programs, utilizing as well Langley's other extensive laboratories, will expand and supplant Langley's existing graduate program which currently enrolls 460 students.

Langley's projection of future graduate training needs (750 students by 1967), combined with the general need for more technological specialists, indicate that VARC's total graduate registrations will reach 1000 students in a relatively short time.

Plans for VARC are being implemented through the joint efforts of the sponsoring institutions and the Langley Research Center, assisted by the State Council of Higher Education for Virginia. Initial research facilities will be completed by early 1965, with instructional facilities scheduled to open by late 1965 or early 1966.
# VIRGINIA ASSOCIATED RESEARCH CENTER

## TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>TITLE</th>
<th>PAGE NO.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>1</td>
</tr>
<tr>
<td>Educational Needs</td>
<td>3</td>
</tr>
<tr>
<td>Authorization</td>
<td>7</td>
</tr>
<tr>
<td>Organization</td>
<td>9</td>
</tr>
<tr>
<td>Research and Instructional Programs</td>
<td>13</td>
</tr>
<tr>
<td>Selection and Acquisition of Site</td>
<td>19</td>
</tr>
<tr>
<td>Development of Site and Facilities</td>
<td>21</td>
</tr>
<tr>
<td>Financing</td>
<td>24</td>
</tr>
<tr>
<td>Index of Appendices</td>
<td>27</td>
</tr>
</tbody>
</table>
INTRODUCTION

A NEW EDUCATIONAL CENTER

The Virginia Associated Research Center (VARC) is a new off-campus graduate center, sponsored by the College of William and Mary in Virginia, the University of Virginia, and the Virginia Polytechnic Institute. It will manage and operate, under contract, a space radiation effects laboratory for the Langley Research Center of the National Aeronautics and Space Administration, and promote the adjacent development of a graduate campus offering programs for resident credit towards masters and doctoral degrees in several fields of science and engineering.

A STATE-AUTHORIZED PROJECT

VARC has been authorized by appropriate legislation in the Virginia General Assembly, and by implementing resolutions of the sponsoring institutions' governing boards. It has been formally organized through a joint agreement signed by the presidents of the sponsoring institutions, and approved by the Governor of Virginia.

A MUTUAL UNDERTAKING

Plans for VARC are being implemented through the combined efforts of the Langley Research Center, the sponsoring institutions, and the State Council of Higher Education. An assessment of the needs which have led to the creation of VARC, and a summary of its status, organization, and plans are presented in the following pages.
Figure 1. - Hampton Roads metropolitan area showing proposed location of Virginia Associated Research Center.
EDUCATIONAL NEEDS

THE HAMPTON ROADS AREA

State and national educational authorities have recognized for some time that higher education in the Hampton Roads area (comprising the cities of Norfolk, Newport News, Portsmouth, and Hampton, together with surrounding communities) has not kept abreast of its growth as a major metropolitan area on the East Coast. Long the site of extensive military installations, this urban complex is now the third largest commercial port in the country, and a population center of over 600,000. With the mushrooming advance of the national space program, it has become an important center of space technology as well.

Figure 1 is a map of the area. In Appendix A are listed local colleges, together with a general description of technological activities supported by federal installations and local industry.

The six local colleges are wholly or largely undergraduate institutions, with no extensive graduate programs in science and engineering. Recent manpower surveys emphasize a continuing shortage of trained scientific and technological personnel.

It is apparent from the evidence at hand that the area's greatest educational need is for programs to increase its supply of technological manpower, and to serve its continuing educational and research demands. Yet these are precisely the kinds of programs in which it is most deficient.

THE LANGLEY RESEARCH CENTER

Foremost and largest among the technological activities of the Hampton Roads area is the Langley Research Center's program of aerospace research. This agency does the research and development which provides fundamental scientific information and basic engineering data for the development of future spacecraft and aircraft. It faces a continuing need for enlarging and upgrading its sizable technological staff in highly competitive science and engineering fields (see table 1).
The Langley Research Center employs a growing staff of technological specialists (now in excess of 1400) in the following engineering and scientific disciplines for research and development in the indicated fields of specialization.

<table>
<thead>
<tr>
<th>Disciplines</th>
<th>Fields of Specialization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aeronautical Engineers</td>
<td>Fluid and Flight Mechanics</td>
</tr>
<tr>
<td>Aerospace Engineers</td>
<td>Thermodynamics</td>
</tr>
<tr>
<td>Ceramic Engineers</td>
<td>Heat Transfer</td>
</tr>
<tr>
<td>Chemical Engineers</td>
<td>Structures</td>
</tr>
<tr>
<td>Electrical Engineers</td>
<td>Dynamic Loads</td>
</tr>
<tr>
<td>Electronic Engineers</td>
<td>Solid State Physics</td>
</tr>
<tr>
<td>Engineering Physicists</td>
<td>Materials</td>
</tr>
<tr>
<td>Mathematicians</td>
<td>Vibrations</td>
</tr>
<tr>
<td>Mechanical Engineers</td>
<td>Acoustics</td>
</tr>
<tr>
<td>Metallurgical Engineers</td>
<td>Instrumentation</td>
</tr>
<tr>
<td>Metallurgists</td>
<td>Communications</td>
</tr>
<tr>
<td>Physicists</td>
<td>Guidance and Control</td>
</tr>
<tr>
<td>Structural Engineers</td>
<td>Orbital Mechanics and Navigation</td>
</tr>
<tr>
<td></td>
<td>Propulsion Systems</td>
</tr>
<tr>
<td></td>
<td>Physics of the Atmosphere</td>
</tr>
<tr>
<td></td>
<td>Magnetogasdynamics</td>
</tr>
<tr>
<td></td>
<td>Simulation</td>
</tr>
<tr>
<td></td>
<td>Flight Systems</td>
</tr>
<tr>
<td></td>
<td>Data Systems</td>
</tr>
<tr>
<td></td>
<td>Conceptual and Engineering Design</td>
</tr>
</tbody>
</table>
As with most technological specialists, candidates for employment at the Langley Research Center are putting increased emphasis upon the ready availability of opportunities for continuing education, leading to graduate degrees from recognized institutions of higher learning. This has also been an important factor for Langley in maintaining and upgrading the technological proficiencies of its permanent staff.

The dearth of advanced educational programs in the Hampton Roads area has been offset to some extent by cooperative arrangements with the University of Virginia and the Virginia Polytechnic Institute, through which extension courses are made available to Langley employees, and supplemented by leaves of absence to selected staff members for completing degree requirements in residence on campus. In spite of relatively large enrollments, however, the program has had to operate under limiting factors that are not entirely satisfactory to either the institutions or the Langley Center.

Figure 2 traces the enrollment history of the Langley graduate study program since 1949, and projects it for the next 5 years. Currently there are 360 Langley employees enrolled in graduate study courses, with an additional 100 on leave in college residence.

![Figure 2. - Growth of graduate study enrollments at Langley Research Center.](image-url)
VIRGINIA ASSOCIATED RESEARCH CENTER

Increased responsibilities for supporting research and development in connection with Project Apollo mean an expanded technological staff for Langley, with consequent increases in graduate enrollment, estimated at 750 by 1967. The present extension-plus-leave graduate program, deficient for Langley's current needs, would be wholly inadequate by 1967.

THE IMPACT OF VARC

The VARC program is designed for the general characteristics of the Hampton Roads area, in keeping with its status as a major metropolitan complex and its growth as an urban center of technology. Simultaneously, it is oriented to the immediate and specific needs of the Langley Research Center.

Langley's requirements for an intensified research program, and for improved graduate training opportunities, will constitute an initial focus of support and development for VARC activities.

These activities, in turn, are certain to generate renewed educational interest among other federal installations in the area with significant technological activities; the same is true of technological industry. All of these employ scientists and engineers to promote their own research and development programs.

The local undergraduate colleges are destined to play an important role as feeder institutions for the graduate programs at VARC. Although VARC will attract students from the rest of the State, from the region, and from the nation, its location within commuting distance of several undergraduate institutions will be a special stimulant to increased interest among undergraduates desiring to pursue graduate careers in science and engineering.

Because of its location, therefore, VARC will be the hub of educational interest and trends that collectively provide an unequalled opportunity for growth and service.
AUTHORIZATION

ENABLING LEGISLATION

House Joint Resolution No. 48, and House Bill No. 725, Acts of the Assembly, 1962, provide the legislative sanction for the Virginia Associated Research Center as an official project of the Commonwealth of Virginia. The joint resolution authorizes the State Council of Higher Education to initiate negotiations on this project, and the Governor to acquire land for the Center in the name of the Commonwealth.

House Bill 725 authorizes the governing bodies of the sponsoring institutions to enter into joint agreement for the management of the Center, and to negotiate and execute contracts with NASA for the operation of the space laboratory.

In addition, the General Assembly appropriated $250,000 to the Governor's Office, under Item 29.1, Chapter 640, Acts of the Assembly, 1962 (Appropriations Act), for preliminary planning of "graduate study facilities and programs in the Hampton Roads area".

Copies of these legislative documents are included herein as Appendix B.

BOARD RESOLUTIONS

In accordance with the provisions of House Bill No. 725, the Boards of Visitors of the sponsoring institutions have passed appropriate resolutions authorizing their Presidents to enter into joint agreement to create the Virginia Associated Research Center, and authorizing their Rectors jointly to negotiate and execute a contract with NASA for the operation of the space laboratory.

Copies of the board resolutions are included herein as Appendix C.
A draft of the joint agreement creating the Virginia Associated Research Center was submitted to the Governor before being signed by the Presidents, and was reviewed and approved by him on May 23, 1962. A copy of the Governor's letter of approval is included herein as Appendix D.
ORGANIZATION

JOINT AGREEMENT

The formal agreement, setting forth the purposes and organizational structure of the Virginia Associated Research Center, was signed by the Presidents of the sponsoring institutions on July 1, 1962. A copy of the agreement is included herein as Appendix E.

PURPOSE

As stated in the formal agreement, the purpose of the Virginia Associated Research Center is

(a) To develop procedures and methods whereby the College of William and Mary in Virginia, the University of Virginia, and the Virginia Polytechnic Institute may enter into contract with the National Aeronautics and Space Administration for the management and operation of the proposed space radiation effects laboratory;

(b) To develop a research program in which qualified institutions of higher learning and other research organizations may use the laboratory;

(c) To develop a coordinated program of resident graduate instruction under the joint sponsorship of the College of William and Mary in Virginia, the University of Virginia, and the Virginia Polytechnic Institute, and such other institutions as may subsequently become affiliated with the Center.

MANAGEMENT

The tentative organizational chart identifies the important management committees and operating personnel, and portrays the relationships between them (figure 3). Following are brief explanations of responsibilities and duties.
Figure 3. - VARC chart of organization.
The governing committee, composed of the three presidents of the sponsoring institutions, has been delegated ultimate authority by the several Boards of Visitors for the management and operation of VARC.

The Director of VARC will be appointed by the governing committee and responsible to the committee for implementation of basic policy. He will be in charge of the day-to-day operation of the Center.

The administrative council, composed of staff members from the sponsoring institutions and NASA, will develop and recommend policy for the day-to-day management of the Center. It will advise with the Director on matters concerning research administration and needs of the Center.

The scientific advisory board, composed of scientists from the institutions and the country at large, will review the research program and advise with the Director and administrative council on the technical development of the research program.

The graduate study advisory board, representing the sponsoring institutions, will serve as an advisory group to the governing committee in the development of the program of graduate studies.
Figure 4. - Space Radiation Effects Laboratory.
VIRGINIA ASSOCIATED RESEARCH CENTER

RESEARCH AND INSTRUCTIONAL PROGRAMS

APPLIED RESEARCH IN SPACE RADIATION

The initial research facility of VARC will be the NASA Space Radiation Effects Laboratory (figure 4), containing a 600 mev synchrocyclotron and a linear electron accelerator in the 10 mev range. Its primary function will be to simulate the radiological conditions of outer space, in order to test and appraise structural, shielding, electronic and other materials and equipment used in the construction of space vehicles.

There are specific and well-defined needs for this kind of scientific and engineering data in the development of Project Apollo. The Langley Research Center will reserve a sufficient portion of the facility's available capacity to carry out its program without delay.

BASIC RESEARCH

While the initial activities of VARC are centered in the priority needs of space technology, the sponsoring institutions and their contractual partner, NASA, are committed to the development of advanced research opportunities in broad areas of science and engineering.

The design and capacity of the space laboratory exceeds the present requirements of applied research in radiation effects on materials and equipment. Accordingly, the total research program will promote the facility's potential in related areas, including -- but not limited to -- such fields as high-energy nuclear physics, chemistry, metallurgy, biology, and medicine.

Associated with these studies will be the development of new experimental techniques, as well as the design and fabrication of instruments, equipment, computers, and other supporting facilities for research.

VARC's policies will encourage, not only breadth of research activity, but wide participation as well. Through cooperative programing,
# Table II

**Graduate Programs at Langley Research Center**

## A. Current Programs through Extension

(In cooperation with U. of Va. and V.P.I. Credits may applied to advanced degrees.)

<table>
<thead>
<tr>
<th>Masters Programs</th>
<th>Doctoral Programs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aerospace Engineering</td>
<td>Aerospace Engineering</td>
</tr>
<tr>
<td>Engineering Physics</td>
<td>Engineering Physics</td>
</tr>
<tr>
<td>Mechanical Engineering</td>
<td>Physics</td>
</tr>
<tr>
<td>Electrical Engineering</td>
<td>Statistics</td>
</tr>
<tr>
<td>Physics</td>
<td></td>
</tr>
<tr>
<td>Metallurgical Engineering</td>
<td></td>
</tr>
</tbody>
</table>

## B. Current Resident Degree Programs

(In cooperation with the College of William and Mary)

### Masters Programs

- Mathematics
- Physics

## C. Desirable Expansion of Programs in Terms of Need

- Chemistry
- Chemical Engineering
- Nuclear Engineering
- Biophysics
- Astrophysics
- Solid State Physics
- Applied Mathematics

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research opportunities will be extended to the scientific staffs of the sponsoring institutions and to other qualified scientists and research enterprises.

GRADUATE TRAINING FOR RESIDENT CREDIT

The research activities at VARC will generate the requisite conditions for the development of organized instructional programs. The full-time professional staff of the space laboratory will be scientists with specialties in physics and engineering. Visiting scientists in many specialties will be at the VARC facilities for extended periods of time, setting up, monitoring, and otherwise participating in research projects.

A graduate advisory board representing the sponsoring institutions can utilize the services of research personnel in the teaching of graduate courses and the supervision of graduate theses. As the sponsoring institutions develop full-time faculties in major program areas, resident credit can be awarded toward master's and doctoral degrees at the sponsoring institutions.

PROGRAM DEVELOPMENT

The initial demand for graduate programs, like the research program, arises from the needs of NASA for improved opportunities in continuing education for their technological staff.

There will be a transitional phase during which the buildup of resident programs at VARC will parallel, and then supplant, to a large extent, the current extension programs at Langley.

Priorities for program development will be determined by the sponsoring institutions.

PROGRAM AREAS

In table II (items A and B) are listed the current extension and resident graduate programs available through the Langley Research Center.
With the development of VARC, these programs will be transferred to VARC facilities, and augmented as indicated under Item C.

Particular degree offerings will remain identified with particular institutions, although cooperative agreements will be worked out between the sponsoring institutions for interchange of faculty and transfer of credit.

ADDITIONAL LABORATORIES

To avoid wasteful proliferation of facilities, VARC will promote cooperative agreements with the Langley Research Center for the use of their laboratories and equipment in the VARC graduate programs. In addition, the College of William and Mary -- just 15 miles away -- has under construction a $1.4 million science building.

The fact is that many of the facilities at the Langley Research Center are being used for thesis work by students enrolled in the current graduate program at Langley. The major laboratories at Langley, representing an investment of over $200 million, include transonic, supersonic, and hypersonic facilities, high-temperature materials and structures research laboratories, gas dynamics facilities, instrument research laboratories, and space structures and vehicles testing devices.

Thesis research can easily be supported by auxiliary laboratories of Langley’s major facilities. These contain a wide variety of research equipment, for electronics, physics, structural testing, computing (both analog and digital), space mechanics, and aerodynamics. At the present time, 35 masters and 8 doctoral theses are being prepared as a result of research accomplished in these auxiliary facilities.

The availability of such extensive facilities as these to a beginning graduate center will be a notable asset in the growth of VARC as a first-rate institute of science and engineering. In the long run, it will also be possible for VARC to augment its own research facilities gradually, through the acquisition of surplus equipment, and through appropriations and Federal grants.
ENROLLMENTS

Since a primary objective of the VARC Graduate Center is to supplant and expand the existing programs at Langley (table II), minimum enrollments at VARC are based on enrollment trends at Langley (figure 2).

Enrollment at Langley is currently 460 graduate students. The need to accommodate 750 graduate trainees is projected for 1967.

In addition, however, VARC will meet graduate training needs for other Federal installations and local industry, and will attract many 4-year college graduates seeking further specialized training.

The combined demand for the VARC program therefore represents an enrollment potential of 1,000 students in the immediate future, and a long-range potential of 2,000 students.
Figure 5. - Aerial photograph of Oyster Point Back-up Storage Area showing location relative to Langley Research Center.

A - Portions retained by Air Force.
B - Site of SREL.
C - Land requested by Commonwealth of Virginia.
SELECTION AND ACQUISITION OF SITE

ADJACENT DEVELOPMENTS FOR COMMON INTERESTS

Because the total research and training program projected for VARC requires a close association between the space laboratory and the graduate campus, NASA has agreed to build the laboratory outside the boundaries of its present installations at Langley Field, and to work with the Commonwealth in developing the laboratory and the graduate campus on adjacent tracts of land.

An adequate basic site has been selected, and tentative agreements as to its availability and usability have been reached between NASA, the Commonwealth of Virginia, and the Department of the Air Force.

LOCATION

The site is located on the Lower Virginia Peninsula in the City of Newport News, approximately 11 miles west of Langley Field, fronting on State Route 143, the main highway between Newport News and Williamsburg. It consists of 457.97 acres surrounding an Air Defense Command Bomarc Facility, and is the northwesternmost portion of an Air Force installation designated as the Oyster Point Back-up Storage Area.

The Air Force has declared this portion of the installation as excess to its needs.

The site and its location relative to Langley Field may be determined by referring to the aerial photograph (figure 5). Metes and bounds are given in Appendix F.

THE SPACE LABORATORY TRACT

The Langley Research Center has selected 110 acres of the basic site for construction of the space laboratory. Because of priorities enjoyed
VIRGINIA ASSOCIATED RESEARCH CENTER

by Federal agencies in the disposition of surplus Federal land, it is anticipated that title to this portion of the site will pass directly to NASA from the Air Force, as soon as the necessary clearances have been received.

THE GRADUATE CAMPUS TRACT

The remaining 347.97 acres are considered by the Commonwealth of Virginia as desirable for the long-range development of the graduate center. It is proposed that this acreage be transferred, with maximum public benefit allowances for educational purposes, under the provisions of the Federal Property and Administrative Services Act of 1949.

Figure 6. - Long-range site development plan.
VIRGINIA ASSOCIATED RESEARCH CENTER

DEVELOPMENT OF SITE AND FACILITIES

THE SPACE LABORATORY

Langley Research Center has received title to its 110 acres and proposes to begin basic site improvements and construction of the laboratory immediately.

Completion of the building and installation of the linear accelerator is scheduled for the spring of 1964, with the accelerator becoming operational by July 1964. The synchrocyclotron is scheduled for installation by early 1965, becoming operational by July 1965.

THE GRADUATE CENTER

This major educational undertaking will necessarily be developed in progressive stages, beginning with general purpose facilities and advancing into specialized facilities for major program areas at later stages. Initial facilities will be designed to house administrative, instructional, laboratory and library operations, and to provide an auditorium for large lecture sections or conferences.

Figure 6 is a long-range site development plan which earmarks specified parcels of land for progressive development in accordance with the future needs of the Center for expanded facilities. Such needs will be basically determined, as previously indicated (pages 13 and 15), by the development of research activities and related instructional programs in support of space technology, beginning with the activities of the Space Radiation Effects Laboratory. Table III on the next page outlines a proposed timetable for beginning developments on each separately identified parcel of land.

The access road to the Bomarc facility will be relocated in the long-range plan to provide for more orderly development of the graduate center. At the appropriate time, the Commonwealth will undertake negotiations with the Air Force for the land exchange necessary to move the access road from its present location as shown on the survey map and described in the metes and bounds (Appendix F).
TABLE III
ACREAGE ALLOTMENTS AND SCHEDULE OF DEVELOPMENT
FOR
LONG-RANGE PLANS AT VIRGINIA ASSOCIATED RESEARCH CENTER

<table>
<thead>
<tr>
<th>Parcel</th>
<th>Acreage</th>
<th>Date for initial development</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>62.97</td>
<td>July 1, 1964*</td>
</tr>
<tr>
<td>B</td>
<td>57.00</td>
<td>July 1, 1969**</td>
</tr>
<tr>
<td>C</td>
<td>57.00</td>
<td>July 1, 1969***</td>
</tr>
<tr>
<td>D</td>
<td>57.00</td>
<td>July 1, 1974</td>
</tr>
<tr>
<td>E</td>
<td>55.86</td>
<td>July 1, 1979</td>
</tr>
<tr>
<td>F</td>
<td>58.14</td>
<td>July 1, 1984</td>
</tr>
</tbody>
</table>

*Initial planning has begun for facilities to house administrative, instructional, and research activities in high-energy nuclear physics.

**Parcel B will be reserved for the development of such student and faculty housing as the future growth of the Center may require. These facilities will be planned as 100 percent self-liquidating projects.

***Parcel C will be reserved for the initial development of specialized instructional and research facilities in program areas determined by the future growth of the Center.
THE FIRST PHASE

Detailed plans and cost estimates for the first phase are being prepared and will be submitted to the 1964 session of the Virginia General Assembly. Construction would begin in the fall of 1964, with the buildings ready for occupancy by late 1965 or early 1966.

In the meantime, organized instructional programs would be temporarily accommodated in existing facilities elsewhere in the area -- at the College of William and Mary, at the Langley Research Center, or in other available classroom facilities.

SUBSEQUENT PHASES

The long-range plan will be kept under continuing review. The timing and direction of its development will be subject to evolving conditions. Its implementation would be based on detailed plans and cost estimates reviewed and approved by succeeding General Assemblies.

THE NEED FOR FLEXIBILITY

Although the VARC plan is based on well-defined needs and clear objectives, it must remain evolutionary in its development. It has the basic potential to become a major scientific and engineering institute, serving the State and nation in critical fields of training and research. But it needs protection to grow in response to technological demands, trends, and developments that cannot be anticipated with any precision at this time.

For these reasons especially, the determination of acreage to be transferred should be based primarily on contingencies of the long-range future, more than on specifiable conditions of the present. It is proposed that the total surplus acreage at the Oyster Point site be made available for VARC's future growth, by direct transfer to the Commonwealth, or through other suitable arrangements that would prevent incompatible developments from stifling expansion to its full potential.
FINANCING

THE SPACE LABORATORY

Site development and initial construction of the Space Radiation Effects Laboratory will be financed by NASA at an estimated cost of slightly under $13 million.

Operation of the laboratory, estimated at a yearly cost in excess of $1 million, will be financed through a cost reimbursable contract between NASA and VARC. As the research program develops, and additional institutions and agencies sponsor research projects at the laboratory, a substantial portion of the operating costs will be recovered by VARC through research contracts with individual sponsors.

THE GRADUATE CAMPUS

The 1962 General Assembly appropriated $250,000 to the Governor's office, to assist VARC in planning "graduate study facilities and programs in the Hampton Roads area". A substantial portion of this appropriation will be expended within the next year by the sponsoring institutions, to augment their scientific staffs and to prepare for research operations at the space laboratory. The remaining portion will be devoted to planning basic site improvements and initial capital facilities.

The progressive development of instructional and supporting facilities will be financed by State appropriations and through such other sources as may become available for the construction of educational buildings. Revenue-producing facilities will be largely self-liquidating projects, financed through the customary sources of funds available for such facilities.

Operating costs for the educational programs will be financed through fees and services charges, supplemented as necessary by State appropriations. An initial source of revenue for instruction is assured by contract arrangements NASA has had for many years with the sponsoring institutions.
The Governor of Virginia has received from the governing committee of VARC request for $1,100,000 in appropriations for initial capital outlay, equipment, and operating costs for the 1964-66 biennium.
INDEX TO APPENDICES

<table>
<thead>
<tr>
<th>TITLE</th>
<th>PAGE NO.</th>
</tr>
</thead>
<tbody>
<tr>
<td>APPENDIX A</td>
<td>29</td>
</tr>
<tr>
<td>Collegiate Institutions and Significant Technological Activities in the Hampton Roads Area</td>
<td></td>
</tr>
<tr>
<td>APPENDIX B</td>
<td>30</td>
</tr>
<tr>
<td>Enabling Legislation</td>
<td></td>
</tr>
<tr>
<td>APPENDIX C</td>
<td>35</td>
</tr>
<tr>
<td>Governing Board Resolutions</td>
<td></td>
</tr>
<tr>
<td>APPENDIX D</td>
<td>41</td>
</tr>
<tr>
<td>Governor's Letter</td>
<td></td>
</tr>
<tr>
<td>APPENDIX E</td>
<td>42</td>
</tr>
<tr>
<td>Joint Agreement</td>
<td></td>
</tr>
<tr>
<td>APPENDIX F</td>
<td>49</td>
</tr>
<tr>
<td>Metes and Bounds of Oyster Point Property</td>
<td></td>
</tr>
</tbody>
</table>
APPENDIX A

COLLEGIATE INSTITUTIONS AND SIGNIFICANT TECHNOLOGICAL ACTIVITIES IN THE HAMPTON ROADS AREA

INSTITUTIONS OF HIGHER LEARNING

1. College of William and Mary (Williamsburg)
2. Old Dominion College (Norfolk)
3. Virginia State College (Norfolk)
4. Frederick College (Portsmouth)
5. Hampton Institute (Hampton)
6. Christopher Newport College (Newport News)
7. Virginia Wesleyan College (Princess Anne) (Opens 1964)

TECHNOLOGICAL RESEARCH AND DEVELOPMENT

1. Aerospace Research and Development (NASA)
2. Ordnance Research and Development (Naval Weapons Station)
3. Transportation Research and Development (Fort Eustis)
4. Underwater Explosives Research (Naval Shipyard)
5. Synthetic Fibres (Dow Chemical Company)
6. Electronics (Hastings-Raydist, Incorporated, Maida Development Corporation)
7. Training Devices (Transdyne)
8. Oceanography (Virginia Institute of Marine Science)

OTHER ENGINEERING ACTIVITIES

1. Shipbuilding and Repair (Naval Shipyard, Newport News
   Shipbuilding and Dry Dock Company, Norfolk Shipbuilding and Dry Dock Company)
2. Naval Mine Engineering (Naval Weapons Station)
3. Air Force Logistics and Operations (Tactical Air Command)
4. Transportation Engineering (Army Transportation Command)
5. Petroleum Refining (American Oil Company)
6. Materials Processing (Union Ore Corporation, Virginia Chemical and Smelting Company)
APPENDIX B

COMMONWEALTH OF VIRGINIA

GENERAL ASSEMBLY

HOUSE JOINT RESOLUTION NO. 48

Relating to the Space Radiation Effects Laboratory in the Hampton Roads area.

Agreed to by the House of Delegates January 31, 1962
Agreed to by the Senate of Virginia January 31, 1962

The Langley Research Center of the National Aeronautics and Space Administration proposes to build a Space Radiation Effects Laboratory in the Hampton Roads area, and desires that Virginia's State-supported institutions of higher learning participate in the management and operation of the laboratory.

The University of Virginia, the Virginia Polytechnic Institute, the College of William and Mary in Virginia, and the Norfolk College of William and Mary have expressed to the Council of Higher Education their willingness to develop a cooperative program for the management and operation of the laboratory, and have further expressed their willingness to cooperate with the Council in the development of a program of graduate studies in the Hampton Roads area.

The Governor of Virginia has called upon the Council of Higher Education to bring together said institutions for the purpose of planning such a program. The establishment of the Space Radiation Effects Laboratory will add substantially to the resources of the Commonwealth in technological education and research, and will be of vital importance to the development of graduate studies in the Hampton Roads area. It likewise has significant implications for future industrial growth in the area and the Commonwealth at large.

The Langley Research Center and the said institutions of higher learning will of necessity enter into certain contractual arrangements for the management and operation of the laboratory. It is desirable
to the development of the associated graduate studies program that land, adjacent to the laboratory, be reserved by the Commonwealth of Virginia for such purposes.

Now, therefore, be it resolved by the House of Delegates, the Senate of Virginia concurring, That the General Assembly does hereby express to the Langley Research Center of the National Aeronautics and Space Administration its unqualified endorsement of the proposal to build a Space Radiation Effects Laboratory in the Hampton Roads area.

Resolved, further, That the General Assembly does hereby express its endorsement of the Governor's recommendation that the Council of Higher Education cooperate with the several aforementioned institutions of higher learning and coordinate their plans and programs designed to provide graduate work on a cooperative basis in the Hampton Roads area, adjacent, if possible, to the laboratory.

Resolved, further, That the State Council of Higher Education be and hereby is authorized to initiate and conduct negotiations with the National Aeronautics and Space Administration to the end that an agreement be reached with one or more of said institutions for the general management and operation of the laboratory, subject to the approval of the Governor.

Resolved, finally, That the Governor be authorized by appropriate legislation to acquire in the name of the Commonwealth of Virginia a suitable portion of land adjacent to, or in the vicinity of, the proposed Space Radiation Effects Laboratory for development of such a graduate program as the General Assembly and the Governor may direct.

Richmond, Virginia.

October 16, 1962.
The Honorable Albertis S. Harrison, Jr.
Governor of Virginia
State Capitol
Richmond 19, Virginia

Dear Governor Harrison:

In the preparation of material in support of the Commonwealth's request for a grant of surplus Federal land on behalf of the Virginia Associated Research Center, it has been noted that House Joint Resolution 48, Acts of Assembly, 1962 did not expressly authorize you to accept such land. It is manifest from the tenor of the resolution, however, that the Assembly has expressed its unqualified endorsement of the negotiations in which we are now engaged.

As your officially designated representative in these negotiations, I will appreciate your counsel and advice on the procedures you now wish me to follow.

Sincerely yours,

[Signature]

William Hugh McFarlane,
Director
November 9, 1962

Dr. William H. McFarlane, Director
State Council of Higher Education
301 Finance Building
Richmond 19, Virginia

Dear Dr. McFarlane:

With respect to your inquiry concerning negotiations for a grant of surplus Federal land, House Joint Resolution 48 indicates the General Assembly's desire that the Governor acquire land adjacent to, or in the vicinity of, the proposed Space Radiation Effects Laboratory for the development of such graduate program as the General Assembly and Governor may direct.

The specific tract of land in question is, in fact, contiguous with the site of the space laboratory. Although legislation effectuating the intent of the joint resolution was not offered at the regular session of the General Assembly in 1962, the Governor can accept at any time title to the land in question under the authority of Section 15, Chapter 640, Acts of Assembly, 1962. At the regular session of the General Assembly in 1964, I will recommend legislation expressly validating any conveyance of the land in question to the Commonwealth of Virginia made in the intervening period.

Accordingly, you are authorized to proceed with negotiations as previously directed.

Sincerely yours,

A. S. Harrison, Jr.
An Act to authorize The College of William and Mary in Virginia, the University of Virginia and Virginia Polytechnic Institute to enter into a joint agreement and to contract with the National Aeronautics and Space Administration for the operation and management of a space radiation effects laboratory in the area of Hampton Roads, Virginia.

Approved March 31, 1962

Be it enacted by the General Assembly of Virginia:

1. The governing bodies of The College of William and Mary in Virginia, the University of Virginia and Virginia Polytechnic Institute, or duly authorized committees of such governing bodies, are hereby authorized and empowered to enter into a joint agreement on behalf of their respective institutions for the operation and management of a space radiation effects laboratory to be constructed by the National Aeronautics and Space Administration in the area of Hampton Roads, Virginia. The joint agreement shall be approved by resolution of the governing bodies of each institution, duly entered upon the minutes thereof, and shall be executed on behalf of each institution by an official designated in such resolution. The governing bodies of said institutions, or duly authorized committees thereof, are also authorized and empowered to negotiate and execute a contract with the National Aeronautics and Space Administration for the operation and management of such space radiation effects laboratory by said institutions in conformity with the terms and conditions of the joint agreement.
The President advised the Board of the passage by the General Assembly of Virginia in the 1962 Session, of House Bill No. 725 (to become effective as Chapter 604, Acts of Assembly, 1962), which authorizes and empowers the governing bodies of The College of William and Mary in Virginia, the University of Virginia and Virginia Polytechnic Institute, or duly authorized committees of such governing bodies, to enter into a joint agreement on behalf of their respective institutions for the operation and management of a space radiation effects laboratory to be constructed by the National Aeronautics and Space Administration in the area of Hampton Roads, Virginia. The Act provides that such joint agreement shall be approved by resolution of the governing bodies of each institution, duly entered upon the minutes thereof, and that such joint agreement shall be executed on behalf of each institution by an official designated in such resolution.

The Act further authorizes and empowers the governing bodies of said institutions, or duly authorized committees thereof, to negotiate and execute a contract with the National Aeronautics and Space Administration for the operation and management of such space
radiation effects laboratory by said institutions in conformity with the terms and conditions of the joint agreement.

In order to carry out the provisions of this Act, the President reported that at his request the University's Counsel had prepared a tentative draft of a joint agreement between the three institutions for the operation and management of the contemplated space radiation effects laboratory and that at a meeting of representatives of the three institutions held on May 10, 1962, which was also attended by representatives of the National Aeronautics and Space Administration and by Mr. William H. McFarlane, Director of the State Council of Higher Education, a final draft of such joint agreement to be submitted to the governing bodies of the three institutions had been agreed upon.

Copies of such final draft were then distributed to the members of the Board for examination.

After full discussion and careful consideration, upon motion duly seconded and carried, the following resolution was adopted:

BE IT RESOLVED, by the Board of Visitors of The Rector and Visitors of the University of Virginia, that the Joint Agreement between The College of William and Mary in Virginia, the University of Virginia and Virginia Polytechnic Institute bearing date of July 1, 1962, for the operation and management of a space radiation effects laboratory to be constructed by the National Aeronautics and Space Administration, in the form submitted to this meeting, be and the same hereby is, approved:

C

- 36 -
BE IT FURTHER RESOLVED, That Edgar F. Shannon, Jr., President of the University of Virginia, be and he is hereby, authorized, empowered, and designated to execute said Joint Agreement, bearing date of July 1, 1962, in the same and on behalf of The Rector and Visitors of the University of Virginia, and that Weldon Cooper, Secretary of this Board, be and he is hereby, authorized, empowered, and designated to affix the corporate seal of this institution thereto and to attest the same:

BE IT STILL FURTHER RESOLVED, That the Rector be and he is hereby authorized, empowered, and designated, as a committee of one of this Board, in conjunction with the governing bodies of The College of William and Mary in Virginia and Virginia Polytechnic Institute, or duly authorized committees of such governing bodies, to negotiate and execute a contract with the National Aeronautics and Space Administration, for the operation and management of such space radiation effects laboratory by said three institutions in conformity with the terms and conditions of said Joint Agreement dated July 1, 1962; and that Weldon Cooper, Secretary of this Board, be and he is hereby, authorized, empowered, and designated to affix the corporate seal of this institution to such contract and to attest the same.

June 1, 1962
WHEREAS, House Bill No. 725 (to become effective as Chapter 604, Acts of Assembly, 1962) was enacted by the General Assembly of Virginia in the 1962 Session, and

WHEREAS, This Act authorizes and empowers the governing bodies of The College of William and Mary in Virginia, the University of Virginia and Virginia Polytechnic Institute or duly authorized committees of such governing bodies, to enter into a joint agreement on behalf of their respective institutions for the operation and management of a space radiation effects laboratory to be constructed by the National Aeronautics and Space Administration in the area of Hampton Roads, Virginia, and

WHEREAS, This Act provides that such joint agreement shall be approved by resolution of the governing bodies of each institution, duly entered upon the minutes thereof, and that such joint agreement shall be executed on behalf of each institution by an official designated in such resolution, and

WHEREAS, This Act further authorizes and empowers the governing bodies of said institutions, or duly authorized committees thereof, to negotiate and execute a contract with the National Aeronautics and Space Administration for the operation and management of such space radiation effects laboratory by said institutions in conformity with the terms and conditions of the joint agreement,

NOW, THEREFORE BE IT RESOLVED, By the Board of Visitors of the colleges of William and Mary, that the joint agreement between the College of William and Mary in Virginia, the University of Virginia and Virginia Polytechnic Institute bearing date of July 1, 1962, for the operation and management of a space radiation effects laboratory to be constructed by the National Aeronautics and Space Administration, in the form submitted to this meeting, be and the same hereby is, approved; and
BE IT FURTHER RESOLVED, That Davis Y. Paschall, President of the College of William and Mary in Virginia, be and he is hereby, authorized, empowered, and designated to execute said Joint Agreement, bearing date of July 1, 1962, in the name and on behalf of the Board of Visitors of the colleges of William and Mary, and that W. Brooks George, Secretary of this Board, be and he is hereby, authorized, empowered, and designated to affix the corporate seal of this institution thereto and to attest the same; and

BE IT STILL FURTHER RESOLVED, That the Rector be and he is hereby, authorized, empowered, and designated, as a committee of one of this Board, in conjunction with the governing bodies of The University of Virginia and Virginia Polytechnic Institute, or duly authorized committees of such governing bodies, to negotiate and execute a contract with the National Aeronautics and Space Administration, for the operation and management of such space radiation effects laboratory by said three institutions in conformity with the terms and conditions of said Joint Agreement dated July 1, 1962; and that W. Brooks George, Secretary of this Board, be and he is hereby, authorized, empowered, and designated to affix the corporate seal of this institution to such contract and to attest the same.

May 22, 1962

- 39 -
BE IT RESOLVED, by the Board of Visitors of the Virginia Polytechnic Institute, that the Joint Agreement between The College of William and Mary in Virginia, the University of Virginia and Virginia Polytechnic Institute bearing date of July 1, 1962, for the operation and management of a space radiation effects laboratory to be constructed by the National Aeronautics and Space Administration, in the form submitted to this meeting, be and the same hereby is, approved:

BE IT FURTHER RESOLVED, That Louis A. Pardue, Vice President of the Virginia Polytechnic Institute, be and he is hereby, authorized, empowered, and designated to execute said Joint Agreement, bearing date of July 1, 1962, in the name and on behalf of Virginia Polytechnic Institute and that Elva M. Redding, Clerk of this Board, be and she is hereby, authorized, empowered, and designated to affix the corporate seal of this institution thereto and to attest the same:

BE IT STILL FURTHER RESOLVED, That the Rector be and he is hereby, authorized, empowered, and designated, as a committee of one of this Board, in conjunction with the governing bodies of The College of William and Mary in Virginia and the University of Virginia, or duly authorized committees of such governing bodies, to negotiate and execute a contract with the National Aeronautics and Space Administration, for the operation and management of such space radiation effects laboratory by said three institutions in conformity with the terms and conditions of said Joint Agreement dated July 1, 1962; and that Elva M. Redding, Clerk of this Board, be and she is hereby, authorized, empowered, and designated to affix the corporate seal of this institution to such contract and to attest the same.

May 15, 1962
APPENDIX D

COMMONWEALTH OF VIRGINIA
GOVERNOR'S OFFICE
RICHMOND
May 23, 1962

Dr. William H. McFarlane
State Council of Higher Education
Room 301, Finance Building
Richmond 19, Virginia

Dear Dr. McFarlane:

I have reviewed the proposed joint agreement concerning the operation and management of NASA's space radiation effects laboratory. It appears to accomplish the desired objectives very satisfactorily and meets with my general approval.

Thank you for the careful attention accorded this important project by your office.

With kindest regards,

Sincerely,

[Signature]

hme

- 41 -
APPENDIX E

JOINT AGREEMENT OF THE COLLEGE OF WILLIAM AND MARY IN VIRGINIA, UNIVERSITY OF VIRGINIA, AND VIRGINIA POLYTECHNIC INSTITUTE FOR AN OPERATION TO BE CONDUCTED UNDER THE NAME OF "VIRGINIA ASSOCIATED RESEARCH CENTER"

WHEREAS, under the provisions of Chapter 604, Acts of Assembly, 1962, the governing bodies of The College of William and Mary in Virginia, the University of Virginia and Virginia Polytechnic Institute, or duly authorized committees of such governing bodies, were expressly authorized and empowered by the General Assembly of Virginia to enter into a joint agreement on behalf of their respective institutions for the operation and management of a space radiation effects laboratory to be constructed by the National Aeronautics and Space Administration in the area of Hampton Roads, Virginia; and

WHEREAS, the governing bodies of said institutions, or duly authorized committees thereof, were also expressly authorized and empowered to negotiate and execute a contract with the National Aeronautics and Space Administration for the operation and management of such radiation effects laboratory by said institutions in conformity with the terms and conditions of such joint agreement; and,

WHEREAS, the purpose of such joint venture will be threefold:

(a) To develop procedures and methods whereby The College of William and Mary in Virginia, the University of Virginia and Virginia Polytechnic Institute may enter into a contract with the National Aeronautics and Space Administration for the management and operation of the proposed space radiation effects laboratory;

(b) To develop a research program in which qualified institutions of higher learning and other research organizations may use the laboratory;

(c) To develop a coordinated program of resident graduate instruction under the joint sponsorship of The College of William and Mary in Virginia, the University of Virginia and Virginia Polytechnic Institute and such other institutions as may hereafter be affiliated;
(2) The guiding principle for the development of graduate instruction to be that it is a cooperative venture, utilizing the capacities and resources of existing institutions. The venture is not to be regarded as a new institution, completely separate in function and control from the institutions that will join together to provide such service. The institutions will share cooperatively in the responsibilities for a sound program, each according to its capacities, with no unnecessary duplication of programs; and,

WHEREAS, in pursuit of the objectives hereinabove set forth and pursuant to the authorization contained in said Chapter 604, Acts of Assembly, 1962, The College of William and Mary in Virginia, the University of Virginia and Virginia Polytechnic Institute desire to enter into such joint agreement, the terms and conditions of which are set out below.

NOW THEREFORE, this JOINT AGREEMENT made and entered into this 1st day of July, 1962, by and between THE COLLEGE OF WILLIAM and MARY in Virginia, (hereinafter generally referred to as the "College"), of the first part, the UNIVERSITY OF VIRGINIA, (hereinafter generally referred to as the "University"), of the second part, and VIRGINIA POLYTECHNIC INSTITUTE, (hereinafter generally referred to as "V.P.I."), of the third part.

WITNESSETH:

That for and in consideration of the premises and pursuant to the authority and power conferred upon them by the General Assembly of Virginia, the parties hereto jointly agree that, in order to pursue the objectives hereinabove set forth, they will mutually and jointly operate and manage the space radiation effects laboratory to be constructed by the National Aeronautics and Space Administration, (hereinafter generally referred to as "NASA"), in the area of Hampton Roads, Virginia, under the following terms and conditions:

1 - NAME

The operation shall be conducted under the name of "Virginia Associated Research Center," (hereinafter generally referred to as the "Center").
II - GOVERNING COMMITTEE

The Governing Committee shall constitute the governing body of the Center. It shall have the ultimate authority, hereby delegated by the Boards of the three institutions, parties hereto, for the operation of the Center. It shall consider and determine all contractual and operating matters. Operating policy, however, shall be determined after consideration of recommendations of the Administrative Council. All matters of internal administration and operation shall be subject to the control of the Governing Committee.

The Governing Committee shall be charged with the ultimate responsibility for the operation of the laboratory and the development and maintenance of a research program in connection therewith. It is authorized and empowered to employ the necessary operational staff, including a director, business manager or agent, operating technicians and housekeeping personnel. Selection of a director shall be subject to the advice and concurrence of NASA.

It is not expected that the Governing Committee will be concerned with day-to-day management of the Center or for scheduling the research program, these matters being considered the responsibility of the Administrative Council, officers and staff, whose decisions, however, shall be subject to review by the Governing Committee.

The Presidents of the three institutions, parties hereto, shall constitute the Governing Committee. The Governing Committee shall elect its own Chairman who shall serve for 1 year from the date of his election or until his successor has been elected and qualified. The Chairman shall be the chief executive officer of the Center and shall perform such duties as may be directed by the Governing Committee. The Chairmanship shall be rotated annually among the three institutions, parties hereto.

III - ADMINISTRATIVE COUNCIL

It shall be the responsibility of the Administrative Council to develop a policy for the day-to-day management of the Center and the research program and scheduling; to recommend policy to the Governing Committee as needed; to determine the research priorities and similar
The Administrative Council shall be composed of two representa­tives each from the College, the University, V.P.I., and NASA. The Director shall be ex officio a member of the Administrative Council and shall act as Chairman thereof.

IV - SCIENTIFIC ADVISORY BOARD

The Scientific Advisory Board shall be a visiting group of scien­tists knowledgeable in the areas of activity of the Center. It will review the research program of the Center at appropriate intervals and shall serve as an advisory group to the Director and Administrative Council in the technical development of such program. It shall perform such other functions as may be referred to it by the Governing Committee or the Administrative Council.

The Scientific Advisory Board shall be composed of two repre­sentatives each from the College, the University, V.P.I., and NASA, and no fewer than three nor more than five scientists, who are not members of the staff of any of the three institutions, parties hereto, or of NASA. Members of the Scientific Advisory Board shall be appointed by the Governing Committee upon the advice of the Admini­strative Council. The Director shall be ex officio a member of the Scientific Advisory Board and shall act as Secretary thereof. The Scientific Advisory Board shall select its own Chairman.

V - DIRECTOR

The Director shall be appointed by the Governing Committee, subject to the advice and concurrence of NASA, and with the advice of the Administrative Council. He shall be directly responsible to the Governing Committee. He must be a ranking scientist as well as a capable administrator. He shall have responsibility for the day-to-day operation of the Center and the implementing of the policies established by the Governing Committee and the Administrative Council. He shall be ex officio a member of the Administrative Council and act as Chair­man thereof. He shall also be an ex officio member of the Scientific
Advisory Board, and shall act as Secretary of that body. He shall perform such other duties as may be delegated to him by the Governing Committee or the Administrative Council.

VI - BUSINESS MANAGER OR AGENT

The Business Manager or Agent shall be appointed by the Governing Committee and shall be responsible to the Director and through him to the Governing Committee. The Business Manager or Agent shall act as purchasing agent, collect and disburse funds, keep all financial records, prepare financial reports and contracts and manage all other fiscal affairs of the Center. The Business Manager or Agent shall perform such other duties as may be designated by the Director or the Governing Committee.

The Governing Committee, in its discretion, may appoint one of the three institutions, parties hereto, to act as Business Agent for such length of time as it deems wise.

VIII - RESEARCH PROGRAM

A research program will be developed to utilize the laboratory. Other qualified institutions of higher learning or research organizations may participate in the research program.

VII - AFFILIATED INSTITUTIONS

It is contemplated that the Norfolk College and possibly other institutions may become affiliated with the Center and the Governing Committee is expressly authorized and empowered to enter into supplementary contracts with such institutions with respect to their affiliation, at such time or times and upon such terms and conditions as may to it seem fair and just.

IX - GRADUATE INSTRUCTION PROGRAM

As the laboratory becomes operative, and members of the scientific faculties of the several institutions are in continuous residence at the Center, a joint coordinated program of resident graduate instruction will be developed. The program of graduate instruction shall
conform to the standards of the Southern Association of Colleges and Secondary Schools.

The institutions that will sponsor the graduate studies program are the three institutions, parties hereto, and upon affiliation, the Norfolk College and such other institutions as may become affiliated with the Center.

In its discretion the Governing Committee may appoint a Graduate Studies Advisory Board, consisting of a representative or representatives from each of the institutions sponsoring the graduate studies program. Such Board shall be charged with the responsibility of developing interinstitutional coordination with respect to the offering of degrees, the teaching of courses and the transfer of credits.

It shall perform such other duties as may be delegated to it by the Governing Committee.

Such Board shall be responsible to the Governing Committee through such channels as the Committee may designate.

X - AMENDMENT

This Joint Agreement may be changed or amended at any time or from time to time by and with the consent in writing of the governing bodies or duly authorized committees thereof of the three institutions, parties hereto, but not otherwise.

XI - TERMINATION

This Joint Agreement may be terminated only by and with the consent in writing of the governing bodies or duly authorized committees thereof of all three of the institutions, parties hereto; provided that the effective date of such termination may not be earlier than the completion date of the contract hereinafter referred to under Article XII.

XII - CONTRACT WITH NASA

The contract with the National Aeronautics and Space Administration for the operation and management of the space radiation effects laboratory shall be in conformity with the terms and conditions of this Joint Agreement.
All that tract or parcel of land situate in the City of Newport News, Commonwealth of Virginia, being more particularly bounded and described as follows:

Beginning at a point which is located on the original east right-of-way line of Virginia State Road No. 143 and the centerline intersection of Oyster Point Road, said point having a Lambert coordinate value (Virginia South Section) of N 287,050.14 E 2,584,939.61, said point being the point or place of beginning; thence along the centerline of Oyster Point Road the following bearings and distances: (1) S 84°-58' E 834.2 feet, (2) N 71°-02' E 475.2 feet, (3) N 58°-32' E 402.6 feet, (4) N 78°-47' E 356.4 feet, (5) S 74°-13' E 277.2 feet, (6) S 77°-13' E 277.2 feet, (7) S 73°-58' E 528 feet, (8) S 82°-58' E 398 feet, (9) N 67°-02' E 435.6 feet, (10) N 74°-47' E 831.6 feet, (11) S 78°-28' E 99 feet, (12) S 71°-13' E 402.6 feet, (13) S 87°-28' E 481.8 feet, (14) N 89°-02' E 217.8 feet, (15) S 69°-58' E 468.6 feet, (16) S 58°-43' E 567.6 feet, (17) S 14°-54' W 15.63 feet to the south right-of-way line of Oyster Point Road, (18) thence along said right-of-way line N 58°-43' W 46 feet to a point on the west right-of-way line of the Virginia Electric and Power Co., thence along the west right-of-way line of said Power Co. the following bearings and distances: (19) S 03°-09' E 230 feet, (20) S 32°-57' E 701.42 feet, (21) S 27°-31' E 1496.3 feet, (22) thence over and across the land of the United States of America the following course S 63°-28' W 5784.94 feet to the original east right-of-way line of Virginia State Road No. 143, (23) thence along said right-of-way line N 27°-28' W 4273.55 feet to the south right-of-way line of the access road to the ADC Missile Facility, (24) thence along said south right-of-way line N 62°-30'-00'' E 194.38 feet, (25) easterly 47.13 feet along a curve to the right having a radius of 40.00 feet, (26) S 49°-59'-20'' E 115.00 feet, (27) easterly
182.61 feet along a curve to the left having a radius of 465.00 feet, (28) S 72°-29'-20" E 1439.97 feet to the boundary line of the ADC Missile Facility, (29) thence along said boundary line S 17°30'-40" W 439.72 feet, (30) S 72°-29'-20" E 3180.80 feet, (31) N 17°-30'-40" E 1546.00 feet, (32) N 72°-29'-20" W 800.00 feet, (33) N 17°-30'-40" E 250.00 feet, (34) N 72°-29'-20" W 510.00 feet, (35) S 17°-30'-40" W 250.00 feet, (36) N 72°-29'-20" W 1870.80 feet, (37) S 17°-30'-40" W 850.00 feet to the north right-of-way line of the access road to the ADC Missile Facility, (38) thence along said north right-of-way line S 77°-07'-42" W 210.13 feet, (39) N 72°-29'-20" W 1258.70 feet, (40) westerly 123.70 feet along a curve to the right having a radius of 315.00 feet, (41) N 49°-59'-20" W 115.00 feet, (42) westerly 223.88 feet along a curve to the left having a radius of 190 feet, (43) S 62°-30'-00" W 194.30 feet to said original east right-of-way line of Virginia State Road No. 143, (44) thence along said east right-of-way line N 27°-28' W 50 -
of 2974.37 feet to point 47 (Lambert coordinates N 284,610.90, E 2,586,207.60) on said right-of-way line; thence, N 62°-28' E, a distance of 1395.06 feet to the point of beginning; containing 110.294 acres, more or less; the net area herein described containing 346.83 acres, more or less.

The United States of America reserves the right of ingress and egress over the following described easements:

1. A road easement 30 feet each side of centerline described as follows: Beginning at a point located S 72°-29'-20" E 973 feet from the southwest corner of ADC Missile Facility, thence S 27°-32'-09" E 1971 feet to the boundary line of Oyster Point Ammunition Storage Area.

2. A drainage easement 25 feet each side of a centerline described as follows: Beginning at a point which is located S 72°-29'-20" E 2770 feet from the southwest corner of ADC Missile Facility; thence (1) S 47°-23' W 408 feet, (2) S 27°-32'-09" E 586 feet to the boundary line of Oyster Point Ammunition Storage Area.

3. A drainage easement 25 feet each side of a centerline described as follows: Beginning at a point which is located S 72°-29'-20" E 2840 feet from the southwest corner of ADC Missile Facility, thence S 27°-32'-09" E 645 feet to the boundary line of Oyster Point Ammunition Storage Area.

4. A road and drainage easement 30 feet each side of a centerline, described as follows: Beginning at a point which is located N 17°-30'-40" E 275 feet from the southeast corner of ADC Missile Facility; thence (1) southeasterly 293 feet along a curve to the right having a radius of 1432.69 feet, (2) S 27°-32'-09" E 302 feet to the boundary line of Oyster Point Ammunition Storage Area.
5. A drainage easement 25 feet each side of a centerline described as follows: Beginning at a point which is located N 17°-30'-40" E 740 feet from the southeast corner of ADC Missile Facility; thence (1) N 47°-23' E 1325 feet, (2) N 77°-35' E 483 feet, (3) N 54°-12' E 168 feet to the west right-of-way line of Virginia Electric and Power Co.

6. A drainage easement 25 feet each side of a centerline described as follows: Beginning at a point which is located N 17°-30'-40" E 1110 feet from the southeast corner of ADC Missile Facility, thence S 72°-29'-20" E 211 feet to the centerline of an existing ditch.

7. A revocable permit power line easement to the Virginia Electric and Power Co. described as follows: Beginning at a point which is located N 17°-30'-40" E 399 feet from the southeast corner of ADC Missile Facility, thence S 72°-29'-20" E 951 feet to a point.

The above described tract is subject to the following easements:

A. A water line easement from the United States of America to the Newport News Waterworks Commission, said parcel or strip of land being 30 feet wide, lying 15 feet on either side of the following described centerline: Beginning at a point which is located N 27°-28' W 50.00 feet from the south corner of the above described tract on the original right-of-way line of Virginia State Road No. 143; thence (1) N 62°-28' E 4116.0 feet, (2) N 74°-04' E 210 feet to the south boundary line of said tract.

B. A road right-of-way easement from the United States of America to the Virginia State Highway Department, said parcel or strip of land being 30 feet wide and 5712 feet long, lying adjacent to and east of the original right-of-way line of Virginia State Highway No. 143.
C. A Gas Pressure Regulation Station easement from the United States of America to Virginia Electric and Power Co. of Virginia, being more particularly described as follows: Beginning at a point located N 27°-28' W 85 feet from the centerline intersection of the access road to the ADC Missile Facility and the east 30-foot easement line granted to the Commonwealth of Virginia for additional right-of-way for Virginia State Road No. 143; thence N 27°-28' W 70 feet along said east easement line, thence N 62°-32' E 40 feet, thence S 27°-28' E 70 feet, thence S 62°-32' W 40 feet to the point or place of beginning.

D. A telephone line right-of-way easement from the United States of America to the Chesapeake and Potomac Telephone Company of Virginia, said parcel or strip of land being 20 feet wide, lying 10 feet on either side of the following described centerline: Beginning at a point which is located easterly 2154 feet along the centerline of Oyster Point Road from the northwest corner of the above described tract at the intersection of the original right-of-way line of Virginia State Road No. 143 and the centerline of said Oyster Point Road, thence S 23°-15' E 1615 feet to the boundary line of the above described tract.

E. A power line right-of-way easement in two sections from the United States of America to the Virginia Electric and Power Co., said parcels or strips of land being 30 feet wide, lying on the south side of Oyster Point Road and more particularly described as follows: Beginning at a point which is located easterly 1992 feet along the south side of Oyster Point Road from the northwest corner of the above described tract at the intersection of the original right-of-way line of Virginia State Road No. 143 and the centerline of said Oyster Point Road, said point being the point of beginning of Section No. 1, thence 261 feet along said road to the end of Section No. 1, thence 1107 feet along said road to the beginning point of Section No. 2, thence 588 feet along said road to the end of Section No. 2 of the above described easement.
Being a part of tract No. 1 acquired for the Oyster Point Back-up Storage Area by deed from Martha Woodroof Hiden, widow and executrix of the estate of Phillip W. Hiden, dated 24 November 1942. Being a part of tract No. 4 acquired for the Oyster Point Back-up Storage Area by deed from Watson Long dated 3 October 1942. Also, being a part of tract No. 11 acquired for the Oyster Point Back-up Storage Area by declaration of taking No. 1, miscellaneous No. 11, dated 8 July 1942, owner unknown. Being all of tract No. 2 acquired for the Oyster Point Back-up Storage Area by deed from Noah S. Blough, dated 20 October 1942. Also being all of tract No. 3 acquired for the Oyster Point Back-up Storage Area by declaration of taking No. 1, miscellaneous No. 11, dated 8 July 1942, owner Phillip W. Murray, et ux.
APPENDIX C

TALK BY DR. FLOYD L. THOMPSON
DIRECTOR, LANGLEY RESEARCH CENTER
VARC DEDICATION
DECEMBER 15, 1965
We are pleased to welcome so many distinguished people to this joint NASA-VARC program of dedication. This program highlights an important phase in a developing pattern of cooperative endeavor involving a large Government laboratory devoted to research in aeronautics and space, and educational institutions in the Commonwealth of Virginia. The Government laboratory is the Langley Research Center of the NASA and the educational institutions are the University of Virginia, the Virginia Polytechnic Institute, and the College of William and Mary in Virginia. This pattern of operation, we believe, is a sound and significant one that has mutual advantages to the participating organizations, to the public in general, and in particular to this rapidly developing portion of the country here in Tidewater. We feel that this pattern will enhance the effectiveness of the research
programs for which the research center is responsible and the effectiveness of the educational programs for which the educational organizations are responsible.

The two facilities being dedicated here today are the NASA Space Radiation Effects Laboratory in which we are now located and which we call SREL and the nuclear science building of the Virginia Associated Research Center or VARC organization. The location of these facilities is as shown on the map. The SREL facility is located here in the center of a 110-acre tract that was obtained as surplus land of the Oyster Point property under the custody of the Air Force prior to its release to us. An additional 348 acres for this tract was obtained by the Commonwealth of Virginia for use as a site for a graduate center of which the first building is the science building that will be dedicated today. The highway mileage from this site is 11 miles to Langley, 19 miles to William and Mary, 137 miles to the University of Virginia, and 284 miles to VPI.

The Langley Research Center has been in operation as a national laboratory dedicated to the studies of problems of flight with a view to their practical solution for nearly half a century. The role of this Center was broadened to include space flight as a result of the Space Act of 1958 which created the NASA with the former NACA or
National Advisory Committee for Aeronautics as a nucleus. During the many years we have operated as a research center we have designed, constructed, and extensively modified a great many research facilities of novel character, varied size, complexity, and cost to permit us to carry out the research required in the performance of our mission. The current book value of our research center at Langley Field is about one-quarter billion dollars. Thus, the addition of this Space Radiation Effects Laboratory to our inventory of facilities is not particularly noteworthy for its size, complexity, and cost but rather for its nature and capability and the pattern of operation that will be followed in its use.

As we became heavily involved in the problems of space flight it quickly became apparent that space radiation and an understanding of high energy physics in relation to space vehicles were essential factors in our areas of activity and responsibility. We soon found that proper attention to these problems would require extensive and convenient use of a research facility, especially designed for studies of the effects of high energy, particulate radiation on all types of matter to be flown in space. The recognition of this requirement led to the construction of the Space Radiation Effects Laboratory that we are dedicating here today. It turned out that requirements for the synchrocyclotron that constitutes the main element of this facility are basically similar to an
accelerator currently existing in Switzerland at the Central European Laboratory for Nuclear Research known as CERN. Fortunately, it was possible through suitable arrangements to utilize the CERN machine as a model to guide the design of basic features of the SREL machine. We were thus able to save a great deal of time in proceeding with the construction of this laboratory.

We elected to propose a pattern of operation with this facility that differs greatly from that which we have followed in the past. An important factor that influenced our reasoning was that a fuller utilization of the facility could probably be realized if we could contrive an operating arrangement that would permit scientists from surrounding educational institutions to assume a share of the responsibility for exploiting the capabilities of this machine. We thought such an arrangement would tend to insure proper utilization of the facility for basic research and stimulate educational opportunities in this area. The latter point is of great importance to us since the opportunity for participation in graduate educational programs is an essential requirement for attracting the type of personnel required in our research activities.

The proposition we developed involved: (1) The idea that the facility would be built on land convenient to the Langley Research
Center but far enough away to permit a new and different pattern of operation; (2) the educational institutions in Virginia, with whom we were involved in graduate programs, would be engaged to operate the facility and exploit its use as a research tool of the educational institutions for approximately half of the available time; and (3) the Langley Research Center would retain exclusive rights for use in its own programs for the other portion of the time.

This proposition, which was first advanced 4 years ago, was rapidly and enthusiastically endorsed by Governor Harrison, the newly elected Governor of Virginia, the three educational institutions involved, that is, William and Mary, the University of Virginia, and VPI. This endorsement was quickly followed in Virginia by unanimous action of both branches of the State Legislature in approving joint resolution number 48 on January 31, 1962, and later by enactment of House Bill 725 that specifically authorized the formation of VARC as now constituted. The United States Legislature approved the authorization and appropriation of $12.3 million for construction of this facility and we obtained the 110-acre site as previously mentioned. The facility was placed squarely in the center of this site to insure no reason for concern as to the hazards of radiation outside the plot on which the laboratory is located. Actual construction of the laboratory was started on August 26, 1963, with a schedule calling for completion in December 1965. In 1964 we obtained an additional
appropriation to permit broadening of the capabilities of the laboratory for studies of basic phenomena involved in these merged fields of high energy physics and space flight. With completion of this addition, the total investment at this site is about $15 million.

The response of the educational institutions of Virginia to the proposal that was made took into account the fact that in this fast developing region an increased opportunity for graduate education in technical fields would serve a general and important public need. This consideration led to a plan to construct a new graduate educational center on land adjacent to the SREL site to be operated by the newly created VARC organization. This aspect of the overall program developing here in Tidewater Virginia will be discussed by Dr. Shannon, President of the University of Virginia and current chairman of the governing body of VARC. The overall program of cooperative endeavor is expected to reach far beyond programs involving only the use of the SREL facility. It is expected that VARC and the LRC will be able to arrange cooperative agreements for the use of certain of the research facilities and equipment at LRC in the VARC graduate programs.

For a description of SREL I am going to depend upon the material with which you have been supplied and the subsequent tour of this facility that will take place after this brief program. Before I close,
however, I should like to express our gratitude for the cooperation of so many individuals and groups in achieving what has been accomplished here. Certainly we owe a great deal to Governor Harrison, and the entire legislative and administrative bodies of the Commonwealth; the presidents and governing bodies of the three educational institutions that constitute the VARC organization; the governing body and certain members of the CERN organization; and the local governing administrative bodies that have helped so effectively in such matters as accelerating the availability of necessary utilities in this previously undeveloped area. In addition to the current presidents of the three educational institutions of VARC, I should like to acknowledge the encouragement and cooperation that we received from Dr. Chandler, Chancellor of the College of William and Mary; and Dr. Newman, former president of VPI; the many contractors that have engaged in this enterprise are due great credit for the manner in which they have executed their responsibilities in the design and construction of the building and in the design, construction, installation, and adjustment of the equipment. I hope I may be excused for lack of detail or inadvertent omissions in this acknowledgment.

My final comment is that the operating contract on the basis of which we will turn the operation of this facility over to the VARC
organization is nearly in hand. I believe in a few days all necessary signatures will be affixed and I can now say to Dr. Shannon, in his capacity as chairman of the governing board of VARC, and to Dr. William McFarlane, the director of the VARC organization, that on January 1 we will place this facility in your hands to be operated in accordance with agreements set forth in the contract that we have discussed between us in such great detail.
APPENDIX D

VARC REORGANIZATION

SEPTEMBER 1, 1967
MEMORANDUM

TO: Virginia Associated Research Center
    Governing Committee

    President, Medical College of Virginia
    President, University of Virginia
    President, Virginia Polytechnic Institute
    President, William and Mary

FROM: Mills E. Godwin, Jr.
    Governor of Virginia

RE: Virginia Associated Research Center

August 3, 1967

In establishing the Virginia Associated Research Center in 1962 the Commonwealth significantly advanced the research and technological resources available to its graduate institutions of higher education. With the support and cooperation of the Langley Research Center of the National Aeronautics and Space Administration, and the use of NASA's research facilities, the VARC affiliated institutions have expanded their research capabilities and are increasing the State's production of scientific manpower and knowledge.

Recognizing the rapid developments in higher education throughout the Commonwealth and the unique potential of the VARC operation, I requested the State Council of Higher Education to review the current activities at VARC and offer such recommendations as it considered appropriate for the future development of this State facility.
Consistent with the recommendations of the State Council and after our discussion on August 1, I have concluded that the contributions of VARC to the Commonwealth will be enhanced by the revisions and changes outlined in the enclosed.

To effect the proposed changes, it is necessary that the Boards of Visitors of the participating institutions concur in the termination of the existing VARC Joint Agreement. In addition, and of equal importance, in my opinion, is the need for the continued support and participation of your institutions on a cooperative basis in future activities of the Center.

It is my hope that the Boards of Visitors of your institutions will approve the termination of the Joint Agreement and the proposed reorganization at their August meeting.

I shall appreciate being advised as soon as your Boards of Visitors have acted on this matter so that I may take the necessary final steps in this reorganization. I would hope that this matter may be resolved by September 1, 1967.

Should there be questions concerning this matter prior to your board meetings, please feel free to call my office.

Governor

Attachment

CC: State Council of Higher Education
Dr. Floyd Thompson, NASA
Dr. Floyd Thompson  
Langley Research Center  
Hampton, Virginia 23365  

Dear Dr. Thompson:

In view of our several conversations concerning VARC, I enclose for your information a memorandum which I am sending today to members of the Governing Committee.

I met with the Committee August first and each of them concurred in the proposed reorganization. It is my hope that the respective Boards of Visitors will take appropriate action so that we can proceed this fall under the new arrangement.

We are greatly indebted to you and Dr. Duberg for meeting with us and for your continued cooperation which is so essential to the attainment of the objectives we all seek.

I hope you will not hesitate to keep me apprised of any development which might have a bearing on this subject.

With kind regards and best wishes, I am  
Sincerely,

[Signature]

Enclosure

August 3, 1967
REORGANIZATION OF THE VIRGINIA ASSOCIATED RESEARCH CENTER

I. REDESIGNATION OF THE VIRGINIA ASSOCIATED RESEARCH CENTER

The Virginia Associated Research Center location shall be formally designated as a Graduate Center of The College of William and Mary. The Graduate Center shall be maintained and operated consistent with the definition and standards for "Centers" as adopted by the Southern Association of Colleges and Schools and, in addition, as specified in the following sections.

II. SPACE RADIATION EFFECTS LABORATORY AT THE GRADUATE CENTER

A. The College of William and Mary shall be responsible for the overall administration, management, and operation of the Space Radiation Effects Laboratory (SREL).

B. Consistent with the provision of the original VARC Joint Agreement, the National Aeronautics and Space Administration (NASA) shall continue to utilize the facilities of the Laboratory up to fifty per cent of its operating time.

C. The College of William and Mary shall insure that the four institutions participating in VARC under the previous Joint Agreement shall be afforded the opportunity to utilize the SREL equipment, space, and machine time as originally projected and for such other purposes as may be feasible in terms of the total demand for use of the SREL facilities.

D. Consistent with the desirability of realizing the fullest utilization of the unique research capabilities of SREL by all institutions of higher education in Virginia having research interests and capabilities compatible with the SREL facilities, The College of William and Mary shall give every consideration in scheduling use of the SREL facilities to any Virginia institution having appropriate research needs. In addition, appropriate institutions outside of Virginia should be given consideration for the use of SREL facilities, to the extent that such scheduling will not restrict the use of these facilities by Virginia institutions.

III. INSTRUCTION AT THE GRADUATE CENTER

A. It shall be the responsibility of The College of William and Mary, in consultation with other state-controlled institutions of higher education and the State Council of Higher Education, to arrange for the availability at the VARC location of
resident graduate credit courses uniquely related to the research activities and facilities of SREL and NASA-Langley.

B. It shall be the responsibility of The College of William and Mary, in consultation with other state-controlled institutions of higher education and the State Council of Higher Education, to arrange for the offering of other resident graduate credit courses not available on the campuses of state-controlled institutions within commuting distance of the VARC location (Old Dominion and William and Mary).

C. It shall be the responsibility of The College of William and Mary, in consultation with other state-controlled institutions of higher education and the State Council of Higher Education, to arrange for the offering of resident graduate credit courses which are available at state-controlled institutions within commuting distance of the VARC location as may be recommended by these institutions and approved by the State Council of Higher Education.

D. It shall be the responsibility of The College of William and Mary, in consultation with other state-controlled institutions of higher education and the State Council of Higher Education, to arrange for maximum offerings of extension courses at the VARC location consistent with the policies and procedures developed by the State Council of Higher Education for the coordination of extension offerings on a statewide basis.

During the 1967-68 academic year, as the transition in the operation and management of the Graduate Center is effected, resident graduate credit courses offered at the VARC location shall be those previously approved by the VARC Governing Committee.

The review and approval by the State Council of Higher Education of individual course offerings at the Center will be an extension of the Council's regular program approval functions only with respect to instruction at this location.

IV. FINANCIAL SUPPORT OF THE GRADUATE CENTER

A. The College of William and Mary shall be responsible for requesting all state funds for the general maintenance and operation and capital outlay needs of the Center. The budget and accounts prepared and maintained by the College for the Center shall be separate from those for the basic operations of the College.

B. State funds needed by any state-controlled institution of higher education to support its courses and/or research activities at the Center shall be duly identified in the budget request of that institution.
In view of the established schedule for the submission of institutional 1968-70 budget requests, a supplemental request may be submitted on or before September 30, 1967, by any institution anticipating a need for state funds to support activities at the Graduate Center at the VARC location.

August 3, 1967
August 18, 1967

Dr. Floyd L. Thompson  
Director, National Aeronautics  
and Space Administration  
Langley Research Center  
Hampton, Virginia 23365

Dear Dr. Thompson:

Your letter of August fifteenth is highly gratifying and I appreciate not only your own statement, but the report on the reception accorded the proposals in the Peninsula community.

I also appreciate your thoughts on the name "VARC", and I am pleased to report that this question has been discussed with Dr. Paschall and it is the intention of the College to carry forward the name under the re-organization. This can be done by retaining the wording "Virginia Associated Research Center", and adding some additional language such as "Graduate Center of the College of William and Mary". We want to preserve all of the benefits that may accrue from the original terminology.

May I add a note of personal appreciation for the tremendous help you have been in connection with the change.

With kindest regards and best wishes,

I am

Sincerely,

fwc
APPENDIX E

NEWS ITEMS RELATED TO VARC'S GRADUATE EDUCATION

1. VARC/SREL AN EXCLUSIVE REPORT--MARCH 1968

2. NASA LEADERS GIVE VIEWS ON VARC CONTROVERSY--APRIL, 1968

3. SOULE URGES GOV. GODWIN TO REORGANIZE VARC--APRIL, 1969

252
VARC, SREL: An Exclusive Report

The four-part series which begins today culminates an intensive two-month Daily Press investigation of the status of the Virginia Associated Research Center and NASA's Space Radiation Effects Laboratory.

Participating in the preparation of this exclusive report were Bill Bryant, assistant city editor of the Daily Press; Richard Price, member of the Williamsburg bureau; John Greif, political affairs writer with the Newport News staff; and Ben Althaler, aerospace writer with the Hampton bureau.

Virginia has seen few projects launched with higher expectations than the Virginia Associated Research Center and its companion Space Radiation Effects Laboratory.

Yet few have produced deeper disappointment.

When the facilities were dedicated here in December of 1968, Gov. Albertis S. Harrison Jr. declared: "I know of no undertaking that holds greater promise or potential."

Yet when one of the project's longtime participants reviewed matters recently, he privately expressed regret at the "death of a glorious idea, just about the most exciting thing ever tried in Virginia education."

Have VARC and SREL failed as the intended ignition for the Old Dominion's thrust into 20th century technology and education?

- Apparently not, according to insiders who ask more questions than problems.

- Despite a host of complications and setbacks, plus indications of further difficulties ahead, VARC and SREL still seem to hold much promise and potential.

- Even these most intimately involved cannot furnish easy answers to all of the questions raised since the creation of VARC and SREL ordered last August by Gov. Miltie E. Godwin Jr., a rethinking which gave the College of William and Mary all administrative control while retaining the cooperative efforts of Virginia Tech, the University of Virginia and the Medical College of Virginia.

- Among the chief questions being asked - and the answers being attempted:

  - Is VARC's fundamental orientation toward graduate-level engineering courses still intact or will the engineering curriculum be broadened and strengthened?

  - Does the addition of graduate-level education and business administration courses dilute VARC's function?

  - No. Such offerings do not conflict with the scheduling of science-oriented courses, are designed for the convenience of Peninsula residents and intended to make greater use of VARC's classroom space.

  - Is hope lost of securing graduate degrees through VARC from one of its associated institutions without having to satisfy the residency requirements of the degree-granting institution?

  - Perhaps a silver of hope remains, but the answer to this question demands a separate treatment, which it will receive in the second installment of this series. A serious debate exists over whether such a hope was ever really practical.

  - Has SREL's $54.4 million cyclotron ceased to be of significant value to the National Aeronautics and Space Administration?

  - No. William and Mary, which now administers SREL under the original state contract from NASA, has apparently improved the cyclotron's operation to the satisfaction of high NASA officials who were reportedly displeased before the reorganization of last August.

  - Will the state have to return to the U.S. Department of Health, Education and Welfare most of the 318 acres granted by the HEW to support VARC's long-range development?

  - Apparently not. Officials acknowledge HEW is concerned over the obvious shelving of the timetable for actually using the land - but report the federal agency is not pressing for a solution and has not indicated it will exercise its contractual right to reclaim the property.

  - If VARC and SREL do not attract aerospace industry, what will become of the nearby 600-acre surplus federal tract purchased by the city of Newport News for use as an aerospace industrial park?

  - Good question. City officials say they are proceeding with the purchase on the assumption the land can be used for aerospace industry, what will become of the nearby 600-acre surplus federal tract being purchased by the city of Newport News for use as an aerospace industrial park?

  - When VARC and SREL were planned, the project was considered a take-over by the city of Newport News for use as an aerospace industrial park.

  - Apparently not, according to insiders who ask more questions than problems.

Critics of the arrangement pointed to the difficulty in getting the busy jurisdictions together, pointing out that the project needed a take-over by the city of Newport News.

Whatever the actual cause, the development of faculty and student enrollment progressed with painful slowness.

Finally, Godwin directed the State Council of Higher Education to study the VARC situation, leading to the dramatic August decision to place VARC and the contract for SREL's operation under the College of William and Mary.

The move was necessary, Godwin repeated in a statement prepared for the Daily Press, "in the interest of simpler administration."

The changeover was approved by the four participating institutions and Langley.

Linked to this approach was the desire to increase the university's role in the region, and its services to both federal, industrial and educational sectors.

Dr. David Y. Pitchard, president of the College of William and Mary, affirmed VARC's mission immediately after the reorganization was announced, asserting that the college would "make this center a valuable piece of our metropolitan area's significant operation which will fulfill its promising potential as a center for economic impact and as a source of educational opportunity for the region and the nation."

"It's not a question of whether we want to or don't want to," he remarked. "It's our stated responsibility to maintain and strengthen the engineering curriculum."

See Report Page 2
**DESPITE GODWIN'S STATEMENT**

**Grad Situation At VARC Still Confused**

By MYRTLE BARNES

Times-Herald Staff Writer

Gov. Mills E. Godwin Jr. emphasized again today that he will not go along with any efforts to make Virginia Associated Research Center a graduate degree-granting institution.

In a statement to The Times-Herald, Godwin said "VARC was not designed originally, and it is not now designed as a degree-granting institution. Graduate degrees in engineering and in the sciences are offered at two state-supported colleges within a few miles."

"The General Assembly just authorized state bonds to increase the state capital outlay needs of higher education; all of our graduate schools are woefully short of funds."

"In light of these facts, it do not see how Virginia could justify another graduate degree-granting institution at the center site."

The basic confusion surrounding graduate degree work at VARC is not cleared up by Godwin's statement, however.

The governors stand is based on advice of the State Council of Higher Education, which clearly does not want another higher education institution at the graduate level established on the Peninsula even while the state is struggling to build up programs at institutions already established.

But the participating colleges at VARC's inception did not agree to be tied to both degree programs at VARC. They wanted to offer their own degree programs and retain firmly established as academic standards—their requirements—at the VARC site.

The colleges (College of William and Mary, the University of Virginia and Virginia Tech) knew two things: (1) Langley wanted a program which provided graduate degrees for its workers without their having to leave the Peninsula. Already in operation was an extensive UVA-VPI extension program which taught courses at Langley, often using Langley instructors. But the men were required to take half of their graduate work on campus (at Charlottesville or Blacksburg) and that required a semester or more missed time from work.

Talks went on for three years while VARC was being built with an aim to providing UVA and VPI degrees in engineering and W&M degrees in physics, with the possibility that the student might take all of his required courses at VARC and not on the home campus.

The idea was to use faculty members from the home campus as VARC instructors; it would not be an extension program—nor would it set VARC up as a competing institution with already existing colleges. VARC would just be a cooperative campus for all participating schools, and the Medical College of Virginia had joined and Old Dominion College had talked about coming in, too.

But VARC bogged down administratively. The prospectus written in 1952 when Virginia sought 347 acres of surplus land from the U.S. Department of Health, Education and Welfare spoke glowingly of supplementing and then supplementing the existing extension programs at Langley and enticing other students—from across the nation, even—with an eye toward 700 students by 1967 and 1,000 or more by the early 1970's.

But no classes started in 1958 as scheduled. Participants schools often couldn't agree on details—and it proved too cumbersome to try to run the center with a Governing Committee made up of the presidents of the three colleges, all of whom were busy running their own institutions.

When the Governor's Budget Committee visited VARC in spring, 1957 they found only a handful of students—and they panicked—the state had $1 million-plus invested in the classroom building there and no one was using it.

The Governor ordered a study by SCHE. It recommended reorganization, and the Governor carried through. In this last September putting W&M in at a substantially lower charge.

Godwin's statement today says that he feels the center is now doing better and more efficiently the job it was designed to do and "I expect to see that it continues to do so."

"Under the new designation of the graduate center of W&M, resident graduate credits can be transferred to graduate schools elsewhere in the state," he notes. "The center has unparalleled research capabilities, immense power as a magnet for industry and a great service potential to Virginia-based firms and students."

"These should be carefully nurtured," Godwin states. He adds that in the transition from tri-camp rule to W&M rule, no courses or services were abolished. "Instead, center—and they have since been considerably expanded," the Governor feels, "and its services to both resident courses and extension offerings will be available and in increasing numbers as demand indicates, not only from W&M but from other colleges and universities."

The reorganization possibly solved some of SREL's administrative problems. It soon became the charge of Dr. Robert T. Siegel, head physicist at W&M, and apparently now functions smoothly under contract to NASA which can use up to half the cyclotron's research time. The other half is available for participating institutions to use for research or for any other institution which has projects which qualify.
WHY HAPPENED TO VARC'S RESIDENT CREDIT PROGRAM

Daily Press
March 26, 1968

STATEMENT OF THE VIRGINIA ASSOCIATED RESEARCH CENTER AND NASA'S SPACE RADIATION EFFECTS LABORATORY

In the preparation of this exclusive report, we wish to thank the Daily Press, especially the editor, for the special permission to discuss the status of VARC. The center is currently facing a significant challenge as it works to overcome the challenges it has faced over the past several years.

The center has been under pressure to provide a more robust credit program, which has been a source of contention for some time. The VIRA and VARE have been working to address these issues, and we are pleased to report that progress is being made.

The center is currently in the process of revising its credit program to ensure that it is more accessible and responsive to the needs of students. We are confident that these changes will lead to a more successful and sustainable credit program for the future.

The center is also exploring new partners and collaborations to enhance its research capabilities and to improve the educational experience for students. We remain committed to providing the highest quality education and research opportunities for all who seek them.

We appreciate the support of our stakeholders and look forward to working together to create a bright future for the center and its students.
No Solution Seen For VARC Dilemma

Indications from Richmond are that Peninsula residents may drive degrees in their dreams; and that at least this type of education program will not be found in the near future. The State Board of Education, which governs Virginia's public schools, has not indicated any plans for establishing a college in the VARC area.

The principal reason for this is the lack of interest on the part of the peninsula residents. While there is a great deal of interest in obtaining advanced degrees in the area, there is no clear indication that the Richmond area has the resources to support such a program.

The lack of interest is partly due to the fact that the Richmond area already has a number of good colleges and universities. However, it is also true that the Richmond area has a large number of graduate students who are already enrolled in programs at other institutions. This makes it difficult to see how a new program could be established.

In the meantime, the Richmond area will have to rely on existing programs to meet the needs of its graduate students. It is likely that this will continue to be the case for some time to come.
The cyclotron's operation at Oyster Point, a naval installation, is vital for research and education.

Nasa's Cyclotron Apparently to Continue

This is the third installment in a four-part series culminating in an intensive two-month Daily Press investigation of the status of the Virginia Associated Research Center and NASA's Space Radiation Effects Laboratory.

In the Peninsula's bid to lead Virginia into the front ranks of aerospace education and related industrial development, the centerpiece was to be the National Commission of Space Administration's synchrocyclotron, at Oyster Point, a naval installation.

With the cyclotron as a primary tool for both research physicists and practical student training, the Virginia Associated Research Center, located on adjacent property, would serve as a valuable classroom companion.

In the instructional process, the question of whether VARC survives its own difficulties, the cyclotron—formally designated the Space Radiation Effects Laboratory—will be in demand for some time to come.

Such is the joint conclusion of Dr. John B. Dubeg, assistant director of NASA's Langley Research Center, and Dr. Robert Siegel, director of SREL.

Siegel has held the job since last Sept. 1, when the colleges of William and Mary assumed administrative responsibility for VARC and SREL under the organization ordered by Gov. Mills E. Godwin Jr.

The appointment of Siegel, then dean of graduate studies and professor of physics at William and Mary, was neither accidental nor casual.

It was accidental because Siegel, a physicist of national reputation, had performed similar work at the US Atomic Energy Commission before coming to Virginia and had recruited William and Mary's first group of high-energy nuclear physicists.

It wasn't casual because the SREL sponsorship had been vacant for several months since the resignation of Dr. P. C. Gugelot, and the space company operated SREL under a contract from NASA, was "in a jam," as one observer put it.

"Let's face it," declared the observer. "The government is paying out a lot of money to get that cyclotron operated efficiently, the educational benefits are secondary."
VARC FACES UNCERTAIN FUTURE AS KEY DEBATE

This is the final installment in a four-part series culminating in an intensive two-month Daily Press investigation of the status of the Virginia Associated Research Center and NASA's Space Radiation Effects Laboratory.

Participating in the preparation of this exclusive report were Bill Bryant, assistant city editor of the Daily Press; Will Moloney, manager of the Williamsburg bureau; John Greiff, political affairs writer, and Hampton News staff writer and Ben Alshuler, aerospace writer with the Hampton bureau.

Agreat deal on an intensified debate over the original intent of the Virginia Associated Research Center's creators, the educational undercurrents which swept VARC into existence may be generating a profound challenge to its fundamental ambitions.

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VARC's success at standing the test of the challenge, these sources further contend, will depend on how the debate itself is resolved.

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With the college and the State apparently intent on reasserting VARC's ambitions within the new, simpler administrative framework, the decision pending from George Washington — and its effects, if affirmative — will be scrutinized with great care. "VARC's future," one veteran observer suggested, "really depends on VARC. The State can make it as attractive as they want it to be. "And it will have to be attractive," he added, "if GW does go ahead with plans to develop a graduate program here."

**KEY — From Page 6**

Fall curriculum won't be fixed, even tentatively, until April 30. "But a prospective student," he continued, "is going to look hard at the residency angle, not merely the courses and facility. I don't think the decision-making process will be simple, however. You'd have to add up a lot of factors."

GW's home campus curriculum includes both masters and doctorates in electrical, mechanical, aeronautical, and civil engineering, as well as a masters in engineering administration. George Godwin, dean of the College of William and Mary, told the Daily Press it would probably be "difficult to say," what effect GW's entrance onto the scene would have on VARC's program. "We do not know much about this proposal," Jones added, "and how it has been met by those at Langley."

VARC's curriculum for the fall semester will be discussed at an April 30 gathering of William and Mary officials and the deans of engineering of Virginia Tech, University of Virginia and Old Dominion College.

**Efforts Continued from Page 8**

In cooperation with the San Jose, Calif., Unified School District, Lockheed Aircraft Corp. is designing an instruction program to encourage culturally deprived children to aim for scholastic success as a step toward job success. Avco Corp., Aerojet-Agnaral Corp., General Dynamics, McDonnell-Douglas and other firms are working with various cities in an effort to solve water pollution and water management problems.

**SOME OF THE MOST meaningful space spinoffs have occurred in the medical field.** Among them are:

- A "sight switch" developed for possible astronaut use is being tested as a means to help immobile patients gain some control over their environment. In some tests they have been able to operate an electric wheelchair merely by moving their eyes.

- In the nonmedical area, space technology has led to the invention of electromagnetic hammers to smooth and shape large panels of metal such as those used in shipbuilding; a camera system that senses radiant sources like runway lights to help bad weather airplane landings; remote sensors for temperature measurements in inaccessible places; long-wearing, highly-heat-resistant paint; and a 24-ounce battery-operated television camera the size of a package of cigarettes, now used for monitoring industrial processes.

**LESHER NOTED THAT the world readily recognizes the economic and practical benefits derived from communications, weather, navigation and other applications satellites.** "The task of our office," he said, "is to transfer the knowledge gained from those less conspicuous items of new technology. "We are, in effect, attempting to design a kind of bank — a knowledge bank. We are asking those who generate new knowledge to invest it in this bank and encouraging all citizens to withdraw knowledge from the bank."
NASA Leaders Give Views
On Controversy At VARC

By MYRTLE BARNES
Times-Herald Staff Writer

Langley Research Center is rather like a bridegroom who lavished a $10 million gift on his wife-to-be — only to be left standing at the church.

The gift was a synchrocyclotron. The bride was the Virginia Associated Research Center, in Newport News.

Langley's top echelon is plainly unhappy at the completion which is preventing VARC from accomplishing its prime purpose — furnishing graduate programs leading to degrees without students ever having to leave the Peninsula.

"We already had a good extension program at Langley — we obviously expected much more than that from VARC," says Dr. Floyd L. Thompson, director of the National Aeronautics and Space Administration's Langley Center.

Thompson and his three top aides — Deputy Director Charles J. Donlan, newly-named acting associate director Dr. John E. Dubberg and T. Melvin Butler, assistant director — spent almost 90 minutes this weekend in a roundtable discussion spelling out for the Times-Herald Langley's views in the controversy over the role of VARC and its future in education.

The current confusion seems to begin with the State Council of Higher Education's summer 1967 study which led to Godwin's reorganization of VARC last fall.

Godwin says now that VARC will not be a separate degree-granting institution and was never intended to be.

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Continuing From Page 12

"I have always taken the position that I would tell the state what we needed; I wouldn't try to tell them how to run their educational programs in supplying that need," Thompson explains.

Back in 1961 Langley hosted members of the state council plus all the college presidents concerned (University of Virginia, Virginia Tech and College of William and Mary; Medical College of Virginia and Old Dominion College...came into the picture later).

NASA men explained what they needed and how they felt VARC could supply it.

Gov. Albertis Harrison in 1962

"IfarrLson noted that "the time has come when Virginia's graduate institutions of higher learning must respond in new and constructive way to the mounting needs of our state and nation for increased scientific manpower and knowledge. Urban centers of technology, in particular, must have ready access to the Commonwealth's most advanced resources in science and engineering."

"VARC is a timely answer to these needs," he wrote. "It will bring to the Hampton Roads metropolitan area new opportunities for graduate training essential to the technological progress."

Thompson said the college presidents all agreed they were in favor of the VARC concept. They indicated they'd have to get agreement of their faculties on curriculum — and this took time. "We had just gotten to the point where they had staffs and seemed ready to move ahead, when this confusion developed after the reorganization," Thompson said.

Gov. Godwin continues to stress the enormous research capabilities of VARC and notes they serve as a magnet for industry and a great service potential to Virginia-based firms and students.

He feels that the reorganization gave simpler administration (VARC is now a graduate center of W&M under sole W&M control but for joint use by the other four institutions). "I feel the center is now doing better and more efficiently the job it was designed to do," Godwin said recently. "I expect to see that it continues to do so."

But the governor's statement was couched in vague generalities. Peninsulars need to know exactly how VARC's program is going to be enhanced.

Godwin's statement noted that the college presidents and boards and NASA officials agreed to the reorganization, but Thompson says that he understood in talks with the Governor at the time of the proposed change that the reorganization would give better administration (particularly more efficiency for SREL scheduling) without changing the basic educational direction of VARC.

Godwin notes that Virginia can't afford another graduate degree-granting center when its funds for graduate education are so woefully short.

Langley officials stress that VARC wouldn't be a separate center, but a joint venture which would strengthen the graduate program at all five participating colleges.

"With the combination of resources of the five schools VARC would have available a high-level staff plus unique research possibilities."
On VARC: It's Up To Va.

By MYRTLE BARNES

"If Virginia doesn't capitalize on the Virginia Associated Research Center, the state is losing an opportunity that may never come again. No college in the state is capable of offering the program VARC could," emphasizes Dr. Floyd L. Thompson, director National Aeronautics and Space Administration.

Thompson and his top NASA aides know the important role VARC can play—not as a separate institution but as a cooperative venture of five universities and colleges—if a graduate level program develops on the Peninsula as originally envisioned by Langley and state leaders.

"VIRGINIA'S got to make some hard decisions," Thompson says. "It lies on the southern edge of a megalopolis. It's got to decide if the state will continue just to supply the labor force, or if it wants to be right out in front of the most advanced fields of technology."

"We've seen great growth at the lower levels, but Virginia's in such a poor situation at the higher levels, the State Council of Higher Education should express itself on what it proposes to do about the situation, if anything," Thompson feels.

Virginia's slipping back in engineering capability all the time, it ranks near the bottom in the nation, points out Dr. John E. Duberg, Langley associate director.

With the combination of resources of University of Virginia, Virginia Tech, Medical College of Virginia, William and Mary Old Dominion Col lege, VARC could have available a high-level staff none of the institutions by themselves could hope to touch, Duberg said.

"Old Dominion's engineering program, for instance, is contrived along, but it will be years—if ever—before it could offer a similar program to what the five working together could have right now at VARC," Duberg stresses.

OLD DOMINION has a long way to go before it even gets to the level of VPI and UVa engineering schools, Langley experts feel.

Meanwhile, Langley's need for trained graduate level personnel—and the similar need of the more sophisticated types of industry communities here to attract—needs a more immediate solution.

"Comparison of the program VARC students have at its best there is in the nation," Thompson states flatly. "We can't be satisfied with one that just compares with the best in Virginia—it's got to equal MIT, California, Michigan State and other leaders."

"Right now VARC's program and the ground rules under which it operates, are not too attractive, says frankly.

"There seems to be a tendency to think too much of the status quo . . . to dismiss the additional staff from its personnel who are authorities of national note in their specialized aeronautical and space fields."

"The community should realize how much VARC program does offer to VARC students 5300 offers to retain programs and businesses."

"The community should realize how much it needs the VARC program," Donlan stresses.

"The Peninsula Industrial Commission has been using the VARC concept as a selling point to attract industry. It has been a dreamer. It needs the program to take advantage of these assets."

"Everything's been hush-hush on the Williamsburg campus. There is talk of VARC's 200-acre tract even being established on the Williamsburg campus. There is talk of VARC already has a good graduate level laboratory."

THE "ATMOSPHERE" of VARC with its predominance of high powered, heady science degree at the indicating potential for thesis work found at the Space Radiation Laboratory.

"We've seen with the VARC program it has a good atmosphere. It has a good graduate level laboratory."

But the Oyster Point plan was based on a VARC where it was possible to take enough courses to gain a graduated degree from one of Virginia's without ever leaving the Peninsula. So far that's not possible.

VARC already has the capacity for a good program on its present budget, with existing facilities and staff, Langley men point out, if Virginia would gain Southern Association of Colleges and Schools' approval of a similar program to what the Peninsula Industrial Commission could desire in its accreditation standards . . . VARC already has a good graduate level laboratory. It has been a dreamer. It needs the program to take advantage of these assets.
Researchers Take A Look At Accreditation Standards

By MYRTLE BARNES
Times-Herald Staff Writer

Accreditation standards would be nationwide — not strict jackets, Langley Research Center leaders say.

If Virginia colleges received a Southern Association of Colleges and Schools' waiver allowing them to offer degrees for work done solely at the Peninsula's Virginia Associated Research Center, it would not be a unique situation, they stress.

"As I see it, the SACS rules are ones which you either follow or give reasons why you are not following them . . . they are not ones to which no exception is ever allowed," says Dr. Floyd Thompson, director of National Aeronautics and Space Administration's Langley center.

Thompson is sure that the original intent was to obtain a waiver, and in fact the three-college governing board in charge before the Fall 1967 reorganization had submitted three tentative degree programs for the center, but has received no indication for approval unless they have university of Virginia and Virginia Tech degrees for study done away at VARC.

The reorganization study by SCHE and Gov. Mills Godwin's later order that the change be effected defined VARC for the first time as a GRADUATE CENTER, as the term is defined by SACS — and that says the center is not a degree-granting institution.

But the reorganization continues to say VARC will offer resident degree credit — i.e. credit that can be used in lieu of that performed in residency on a main campus.

SCHE says courses in the science line will continue to be added to VARC's curriculum. It has not answered the obvious question that results, however. What happens if a man earns enough resident credits through VARC courses to merit a degree under the stipulation of UVA or VPI? SACS approval of granting a UVA or VPI degree in this instance is what Peninsula universities want the statistics to get.

SACS standards encourage colleges to try innovative ways to improve their offerings. "SACS encourages member institutions to conduct experimental programs," says one paragraph. "If these programs are at variance with the standards, the institution is expected to submit the program for approval by the SACS Executive Council."

VARC is an experimental venture — but its concept is far from unique, as far as granting degrees for off-campus work goes. There are 30 universities in the nation which give master's degrees in engineering for off-campus work including UCLA and the Universities of Michigan, Michigan State, Florida, Tennessee, Wisconsin, Washington, New Mexico and several technological institutes elsewhere.

American Society for Engineering Education in its 1958 goals discusses the problems of off-campus instruction. ASEE calls for engineering schools to have part-time on-campus programs when the local situation warrants it, and that "new techniques and arrangements be devised for extending high-quality advanced degree education to engineering students employed at locations remote from established campuses."

The chief concern of ASEE is that feeing at off-campus programs would not be as highly qualified as those on campus which certainly doesn't apply at VARC where the faculty all hold doctorates.

"Meeting each standard of SACS is not all that is required for accreditation" says the rulebook, but SACS is also concerned with "the totality of the effort and the atmosphere in which it is carried on."

The atmosphere of VARC academically couldn't be matched anywhere else in the state, Thompson and his staff feel. There is the high-qualified VARC staff supplemented by Langley's own experts and the visiting professors who come throughout the year to LRC from across the nation and overseas. Research facilities — which SACS stresses as a prime factor in graduate work — can't be beat with the Space Radiation Effects Laboratory plus LRC's $300 million worth of labs all available for thesis work.

SACS also encourages "planned, coordinated inter-institutional programs" by allowing more credits to be transferred than the six normally allowed between schools.

VARC would be such a planned inter-institutional venture since UVA and VPI already recognize VARC courses as acceptable credit on their own campuses, regardless of which university teaches the VARC course. Careful agreement before hand on curriculum and matching the VARC course to its equivalent on the home campus made the arrangement possible. Now engineering departments of UVA, VPI and Old Dominion are slated to meet April 30 to review work done toward additional VARC courses.

Talk persists that W&M will suggest an applied science degree program at VARC. W&M has not confirmed this, but Langley officials indicate that colleges officials have talked with them about the possibility of offering such a degree (based largely on engineering courses taught by physics professors).

Dr. John E. Duberg, associate director of Langley students. He estimates optimistically about 20 per cent of the 500 might be interested; realistically it would probably be closer to 10 per cent, he says.

Langley students — and those of other Peninsula industries using high-level skills — need sophisticated programs aimed at their exact fields. Langley is particularly interested in electrical and aerospace engineering, naturally. The shipyard has an interest toward thermal engineering programs and those in nuclear science as well as the normal fields.

Dr. Thompson stresses that it is not just Langley's interests which are involved at VARC. Langley can easily get the degree program it wants elsewhere (from George Washington University or some other colleges), but it wanted to help Virginia colleges and the Peninsula because this is where Langley is located.

Hartley Soule, who was a Langley assistant director before his retirement and who served as a consultant for VARC's early stages, sums up the case against SCHE and the Virginia government very neatly: "Either they were trying to pull the wool over VARC's eyes, which I don't think was the case, or they have simply changed their minds about VARC's program and are too embarrassed to admit it."

LAST OF THREE PARTS

By MYRTLE BARNES
Times-Herald Staff Writer

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The chief concern of ASEE is that feeing at off-campus programs would not be as highly qualified as those on campus which certainly doesn't apply at VARC where the faculty all hold doctorates.

"Meeting each standard of SACS is not all that is required for accreditation" says the rulebook, but SACS is also concerned with "the totality of the effort and the atmosphere in which it is carried on."

The atmosphere of VARC academically couldn't be matched anywhere else in the state, Thompson and his staff feel. There is the high-qualified VARC staff supplemented by Langley's own experts and the visiting professors who come throughout the year to LRC from across the nation and overseas. Research facilities — which SACS stresses as a prime factor in graduate work — can't be beat with the Space Radiation Effects Laboratory plus LRC's $300 million worth of labs all available for thesis work.

SACS also encourages "planned, coordinated inter-institutional programs" by allowing more credits to be transferred than the six normally allowed between schools.

VARC would be such a planned inter-institutional venture since UVA and VPI already recognize VARC courses as acceptable credit on their own campuses, regardless of which university teaches the VARC course. Careful agreement before hand on curriculum and matching the VARC course to its equivalent on the home campus made the arrangement possible. Now engineering departments of UVA, VPI and Old Dominion are slated to meet April 30 to review work done toward additional VARC courses.

Talk persists that W&M will suggest an applied science degree program at VARC. W&M has not confirmed this, but Langley officials indicate that colleges officials have talked with them about the possibility of offering such a degree (based largely on engineering courses taught by physics professors).

Dr. John E. Duberg, associate director of Langley students. He estimates optimistically about 20 per cent of the 500 might be interested; realistically it would probably be closer to 10 per cent, he says.

Langley students — and those of other Peninsula industries using high-level skills — need sophisticated programs aimed at their exact fields. Langley is particularly interested in electrical and aerospace engineering, naturally. The shipyard has an interest toward thermal engineering programs and those in nuclear science as well as the normal fields.

Dr. Thompson stresses that it is not just Langley's interests which are involved at VARC. Langley can easily get the degree program it wants elsewhere (from George Washington University or some other colleges), but it wanted to help Virginia colleges and the Peninsula because this is where Langley is located.

Hartley Soule, who was a Langley assistant director before his retirement and who served as a consultant for VARC's early stages, sums up the case against SCHE and the Virginia government very neatly: "Either they were trying to pull the wool over VARC's eyes, which I don't think was the case, or they have simply changed their minds about VARC's program and are too embarrassed to admit it."

LAST OF THREE PARTS
Soule Urges Gov. Godwin To Reorganize VARC

By MYRTLE BARNES
Times-Herald Staff Writer

Gov. Mills Godwin should reorganize Virginia Associated Research Center again — this time with a local board or local lay representation — Hartley A. Soule, a founder of VARC, suggested today in an open letter to the Governor.

Soule says the reorganization of VARC in 1967 was “anything, less tenable than the plans.”

Since the reorganization, “the prospects of a technically-oriented center at VARC have been continually diminished,” Soule says. “University of Virginia and Virginia Tech were forced to change their plans to those of a sort of a glorified extension.”

“College of William and Mary has diverted the school facilities (VARC’s site in Newport News) and funds to handle overflow in education and business schools that were adequately conducted in other local facilities in previous years,” Soule charges.

“Much to the chagrin of state educators, George Washington University has moved into the gap created by the 1967 reorganization,” he adds.

Soule — noting that Godwin’s office asked college presidents to meet March 13 to consider what might be done about VARC — calls on the Governor to release publically recommendations resulting from that meeting.

He says, “I understand that the action was not unanimous and a minority report will be included for your consideration.”

Other Peninsula sources indicate that three of the five colleges (UVA, VPI, Old Dominion) voted to seek permissions to grant graduate engineering degrees for work done solely at VARC. This has been the goal of the Peninsula supporters of VARC since its inception.

Rumor has it that ODC would assume major control of VARC’s engineering offerings.

Nothing public has come out of the March 13 session or an earlier meeting of the presidents. A letter from the resident faculty asking for immediate action on the problem — aiming at degree work for 1969-1970 — has gone unanswered by the college leaders.

Soule, as then assistant director of Langley Research Center, was coauthor of the prospectus which won the free federal land on which VARC was built — with the understanding it would provide a graduate program to accompany the $12 million synchrocyclotron which National Aeronautics and Space Administration placed next door.

Soule, noting that operational control of VARC was originally given to a governing body of cooperating college presidents, says this may have been a tactical mistake. “No one thought to ask the presidents who were given charge of the implementation what they thought about, off-campus graduate education.”

Later it was found that, as a group, they were opposed to the idea, “hence the slowness of VARC’s evolution.”

This time, the Governor should be sure that the group who gets operating responsibility, and any lay representatives, have a clear and common understanding of the goals and terms involved, Soule says.

Soule sees four alternative actions which the college presidents could suggest to Godwin:

1. Engineering be closed out at VARC and operations continued as in the past, two years without engineering — a course which would be unpopular in this technically-minded community.

2. Schools offering programs at VARC may offer degrees based solely on work done there—or they may not. If they can’t then alternative one is the only one that makes sense, Soule feels.

3. The center can be operated as a joint venture as originally proposed, but “no single school should be assigned the janitorial chore of operating VARC, as at present, unless it indicates complete willingness to take on the chore without sole control.”

4. The solution which eliminates school rivalries — which “everyone seems to believe is the cause of much of the original delay in VARC’s educational program” — is assignment of the center as part of the campus of one of the schools, giving it complete responsibility for the operation.

Soule recognizes that the problem with this alternative is that the nearest campus, W&M, has no engineering program, UVA is the one which has been taking the initiative in the educational program and other schools have been only lukewarm to the whole idea of VARC.

Soule, acknowledging that Godwin holds the final decision on VARC’s fate, suggests that:

—Any decision cover distribution of VARC funds as well as other responsibilities. Now many VARC funds are still being spent on home campuses, Soule says. “A basic policy should be that money appropriated for VARC is spent at VARC.”

—Godwin seek advisors from the engineering fields instead of relying solely on those “with classical education backgrounds.”

Soule points out that the federal assistance act for graduate education facilities requires governing boards of institutions seeking aid to have local representation. “I suggest that in the VARC reorganization you give the persons most directly affected some representation on whatever organization you assign operating responsibility,” Soule emphasizes.

He concludes by urging Godwin to remember that VARC has been seven years in the building with goals still unrealized. “Its trend can be reversed by a directive,” but it will take time to convert the “present wariness of potential students,” he says, asking that any change be given time to prove itself.

Page 9
APPENDIX F

LETTERS

1. L. WAYNE SWENSON, SREL ACTING DIRECTOR, AUGUST 1967

2. TECHNICAL AND PROFESSIONAL DELEGATION, MARCH 1968

3. HERBERT H. BATEMAN, MARCH 1968

4. FLOYD L. THOMPSON, JUNE 1968

5. HUNTER B. ANDREWS, JULY 1968

6. KEES C. GUGELOT, JULY 1968

7. GENERAL ASSEMBLY OF VIRGINIA, NEWPORT NEWS-HAMPTON
   DELEGATION, JULY 1968

8. HERBERT H. BATEMAN, MARCH 1993

9. HUNTER B. ANDREWS, MARCH 1993
Dear Dr. Thompson:

Recent events prompt me to express my views on what I feel is an urgent matter. In reviewing recommendations which have very serious and long range implications affecting administration of the SREL research program I gain the impression that little attention has been given to several significant points; points which are best appreciated by those who are charged with the daily responsibility of the laboratory operation and its future development.

The present method of administrating the NASA contract for the management and operation of SREL by VARC, while perhaps not perfect, does provide an atmosphere whereby the SREL research program may be administered by the SREL Director impartially. At the moment, in matters of budgeting, scheduling, support of individual experimenter requirements, planning of future facilities, and purchase of research and test equipment, an impartial and balanced viewpoint is taken which serves equally well the NASA space program, VARC's high energy physics research, radiation biology, radiochemistry and development of the laboratory facilities, both for the Cyclotron and the electron machines. This balanced program is possible only as long as the SREL Director and his staff are permitted to function independently in an atmosphere free from unbalanced pressures from a single interest group. If a single institution is given the responsibility for administrative control of the laboratory, the SREL Director and staff could no longer serve these interests impartially.

During my tenure as Acting Director of SREL I have expended considerable effort toward improving the operational performance and capabilities of the laboratory. The laboratory staff has responded very well during this period and we are rapidly building a capable and dedicated staff. The recommendation that... "the Joint Agreement be terminated and full organizational responsibility and administration of VARC (operation of SREL and instructional offerings) be placed under the control of one institution, namely William and Mary", as set forth in a recent memorandum from the State Council of Higher Education for Virginia, can only have the effect of negating much of the recent progress made to improve the laboratory operation. This memorandum has already had considerable impact upon the laboratory staff and if the recommendations of the memorandum are accepted by the Governor of Virginia we can only look forward to another period of stagnation and deterioration in the laboratory program similar to that which was permitted to occur prior to Dr. Gugelot's resignation.
To: Dr. Floyd L. Thompson  

August 7, 1967

Page 2

Such events would serve the interests of no one. If this is to be avoided the SREL Director will need the assurance of a continued appointment without the strangling influence of any single institution.

Your careful consideration of this most important matter is kindly solicited.

Respectfully yours,

L. Wayne Swenson
Acting Director

LWS/bd
cc: Director, VARC
March 6, 1968

Honorable Mills E. Godwin, Jr.
Governor of Virginia
Richmond, Virginia

Dear Governor Godwin:

As a group of technical and professional persons sincerely interested in the growth of higher education in our state, we, the undersigned, wish to make known to you our views on the Virginia Associated Research Center (VARC) situation.

Without indulging in lengthy script concerning the early development of VARC which we have followed with interest over the years, we feel that a plan of action such as that outlined below is essential if VARC is to realize its full potential.

I. Constitute VARC as a Branch of the Virginia State Colleges such that degree offering programs with degrees being awarded by the State schools involved will be possible at VARC.

II. Appoint an Academic Committee at VARC, made up of representatives from the associated colleges, to represent VARC in all instances where graduate program proposals, budget allowances, and other areas which involve VARC are concerned.

III. Ensure that the associated universities allocate a sufficient amount of their funding for VARC.
IV. Remove the restriction that no course may be
offered at VARC which is available at a State College
within commuting distance.

It is imperative that all of the state powers be brought
to bear on the critical problem of future higher education in
our state, and while we realize your interest in this effort,
we feel that a few salient facts are being overlooked. These
are as follows.

1. From one peninsula organization alone, 43% of the
more than one hundred doctoral students went to out-of-state
schools last year.

2. There are many scientific and engineering personnel
on the peninsula who could help augment the graduate
departments of all state universities if these universities
would offer these programs at VARC. These people have
occupational and family responsibilities that preclude their
moving away from the area to do resident graduate work on
the parent campuses.

3. There are also many personnel who, in order to
complete their graduate degrees, do move to the parent
campus. But as noted in 1. above, a large percentage of these
people, once faced with having to move, leave the state
entirely, thus lessening significantly the "student capture
capabilities" of the graduate departments in Virginia
universities.

4. Under the recent Selective Service System ruling
relative to graduate student deferments, the State universities
will need as many students as possible from other sources,
e.g. those with occupational deferments, in order to justify
continuation of their respective graduate programs.

5. There are several graduate programs at the State
universities which have been generated specifically to meet
the needs of peninsula research organizations. Therefore, the
needs of the peninsula alone should be justification for
placing immediate emphasis on VARC's growth since this was one
factor which caused the initial location of VARC at its present
site.
In summary then, Governor, it seems that long range planning for the growth of higher education in our state must include not only the augmentation of graduate programs at the parent universities, but also the growth of branches such as VARC in those areas of our state which have a high concentration of scientific and technical people who require the graduate level training.

In the light of the pitifully slow evolution of VARC, it is evident that unless some stimulus to ensure rapid positive growth for VARC is provided from your office, VARC, as a branch of the State universities for graduate degree work, will die a sure death. Such a demise could have far reaching effects relevant to attraction of new industry as well as to future growth of the graduate departments of our State universities.

We, as members of the scientific and technical community, and as taxpayers and citizens, ask that you give our proposition for positive action at VARC your immediate and earnest consideration.

Very truly yours,

[Signatures]

[Handwritten list of signatures]
In summary then, Governor, it seems that long range planning for the growth of higher education in our state must include not only the augmentation of graduate programs at the parent universities, but also the growth of branches such as VARC in those areas of our state which have a high concentration of scientific and technical people who require the graduate level training.

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We, as members of the scientific and technical community, and as taxpayers and citizens, ask that you give our proposition for positive action at VARC your immediate and earnest consideration.

Very truly yours,

[Signatures]

Richard Budge
Joseph W. Brown
Grace Lawrence
Charles W. Whitlock

[Signatures]
Dr. R. Blackwell Smith, Jr., President  
Medical College of Virginia  
Richmond, Virginia

Dear Dr. Smith:

There is increasing concern among federal, state and local governmental figures and citizens at large on the lower Virginia Peninsula at the failure of the Virginia Associated Research Center to adequately serve the higher educational needs of the community in the field of science and engineering. The general view is that the academic program at V.A.R.C. is not a realization of the concept which occasioned the creation of that facility.

In the very near future I anticipate further discussions with Mr. Joseph E. Blackburn and Dr. Prince Woodard of the State Council on Higher Education with regard to this matter. It is my hope that through discussions with them and thereafter with Governor Godwin a greater sense of urgency on their part with respect to development of the educational program at V.A.R.C. might be excited.

In order that my discussion with the State Council on Higher Education might be more productive I am posing certain questions to the presidents of the educational institutions participating in the V.A.R.C. educational program. The questions, the answers to which will be most helpful and appreciated, are as follows:

1. What courses does the Medical College of Virginia contemplate offering at V.A.R.C. in 1968 and 1969?

2. What degree programs at V.A.R.C. are contemplated under the auspices of the Medical College of Virginia?
3. Will the Medical College of Virginia give credit to students for courses taken at V.A.R.C. under the auspices of other participating institutions?

4. Do you regard student residency at the Medical College of Virginia as a requirement for a degree under the rules and policies of the College or the Southern Association of Colleges and Universities?

5. If on-campus residency is a requirement for a degree under the rules of the Southern Association, would you be agreeable to a request to the Southern Association for a waiver of its rules or in the alternative for a ruling by the Southern Association that the Medical College of Virginia program at V.A.R.C. was operated as a branch of the College so as to obviate the residency requirement?

I believe you will be interested to know that officials of the Langley Research Center of the National Aeronautics and Space Administration are presently discussing with the administration of George Washington University a graduate program in science and engineering to be conducted at the Langley Research Center. It is contemplated that such a program would lead to conferral of degrees by George Washington University on students without any residency requirements at George Washington University.

Considering the tremendous potential for federal research grants at and through V.A.R.C. for the participating institutions and what this can do to reduce the costs of graduate, scientific education, consistent with the elevation and enrichment of such education in Virginia, it is alarming to me that Virginia higher educational institutions may be conceding these advantages to George Washington University. Langley Research Center is interested in a George Washington University oriented program only if the educational needs of its employees is not to be met through V.A.R.C. The opportunity for quality programs in graduate, scientific education at V.A.R.C. should not be lost to an out of state institution for failure to recognize the opportunity and to pursue it.

Your response to the questions posed herein and your comments with regard to the future role of V.A.R.C., as you envision it, will be deeply appreciated.

Sincerely,

Herbert H. Bateman

HHB/mor

Re: Mr. John Maxwell
SENATE
July 8, 1968

Honorable Mills E. Godwin, Jr.
Governor
State Capitol
Richmond, VA

Dear Governor:

I appreciate a copy of your letter of July 3, 1968, addressed to the Honorable Lewis A. McMurran, Jr., regarding the VARC matter.

Needless to say, I am disappointed in the position expressed in your letter and respectfully disagree with the conclusion reached by the Council of Higher Education as exhibiting a lack of understanding of the importance of VARC facility to the entire Commonwealth. It comes as somewhat of a surprise there has been "vigorous" opposition to VARC from the Norfolk area as set forth in two incidents in your letter. Heretofore, I have refrained from discussing this matter with anyone except the local delegations and representatives of the NASA, you, your staff and the Director and Chairman of the Council. I can only assume someone has, in a sense, "stirred up" the Norfolk area people to get "back up", to support the denial of our proposal by the Council. Whether it is recognized or not, we have proceeded on the basis VARC is important to all of the institutions of higher learning in Virginia and not just one. 

I certainly believe in the rightness and righteousness of our cause and regret the recent decision will, in my opinion, effectively commence the slow death of VARC for the immediate future, in view of the fact The George Washington University will offer resident courses at the NASA facility in fields contemplated by VARC this fall.

I shall confer with my colleagues herein Hampton and Newport News, and we shall determine whether we shall appear before the Council of Higher Education. It is my personal opinion at this time the case has already been judged and final verdict reached by the Council. The appeal would be to your office and I would understand your position relative to the matter, although I do not concur to the conclusion you reached. It is my hope we here lay our plan to pursue what we believe is correct, fully realizing the obstacles we shall have to overcome. I am
honestly amazed your letter so clearly indicated the "vigorous" opposition from our neighbors in the Norfolk area evidently influenced the decisions of the Council of Higher Education and you. We have no choice, believing in our cause, except to do everything possible to accomplish the results we think are correct for the future, even to the extent of taking on the Council of Higher Education and our neighbors in the Norfolk area.

The Council's feeling about duplication of effort is erroneous in view of their inconsistent position in other fields of higher education i.e. oceanography at VIMS and O. D. C., physics at W & M, U. V. A., V. P. I., O. D. C. — the question may be when is the Council consistent in its mission!! I certainly realize your position as Governor and respect your upholding the Council. I know you respect our position and the fact we are only at the end of about the third inning!!

Thank you for your courtesies in this prolonged situation and the fairness of your office with us even though we were not successful in convincing you to overrule the Council of Higher Education.

Respectfully,

[Signature]

Hunter B. Andrews

HBA:pip

cc: Honorable Lewis A. McMullan, Jr.
June 12, 1968

Dr. Davis Y. Paschall, President  
College of William and Mary  
Williamsburg, Virginia 23185

Dear Dr. Paschall:

A year ago, the reorganization of the Virginia Associated Research Center (VARC) was under consideration by the Governor of Virginia and shortly thereafter it was completed. By the terms of this reorganization, the College of William and Mary was given responsibility for the overall administration, management, and operation of the Space Radiation Effects Laboratory and also for responsibilities in developing the educational program at VARC. I feel that it is appropriate at this time for me to write you concerning my assessment of events at VARC and SREL since that date.

You will recall that a compelling reason for improvement in the administration of SREL had become very apparent. The large investment in the Space Radiation Effects Laboratory was in need of a greatly improved administrative management in order to develop its capability as a research facility. On that score, I can say that the assumption of responsibility for administration of that facility by William and Mary was marked by rapid progress in setting up an effective directorship and administrative staff that have removed our concern in that area. We feel the inherent capabilities of the facilities at SREL are now being effectively used to good purpose.

In the educational field, on the other hand, the idea that developments at the VARC site would bring to this area new and greatly needed opportunities for graduate education still lacks evidence of fulfillment. In reviewing this situation, I have reread the letter I addressed to Dr. T. Marshall Hahn, Jr., Chairman of the VARC Governing Committee, on April 1, 1965, which said in part:

"The prompt response to my suggestions of last April of the establishment of a program in the area of electronics and communications by a counterproposal from VARC which extended the suggestion to a resident program in the areas of aerospace engineering and engineering mechanics had
given me considerable hope that a program could have been initiated this fall. The enthusiasm for the program exhibited by the Professors of Engineering who visited Langley last summer had also led me to believe that this fall was not an unrealistic date for a start of the resident program in these branches of engineering. It was therefore a source of some disappointment to learn that the Graduate Study Advisory Board could not recommend establishment in September this year of the resident programs in the three fields of engineering under discussion.

"Although the particle accelerators at the Space Radiation Effects Laboratory have certainly added a new dimension for graduate education in Virginia, I have felt that far greater support existed at Langley for graduate education in the fields of engineering and this conviction led to my suggestion of the development of a plan for VARC students to use the already existing research facilities of Langley Research Center. It is to be regretted that realization of this opportunity for graduate engineering education in Virginia now appears to have moved into the future. I feel that it would be unfortunate for this opportunity to be delayed and wonder if there are any steps we could take to help expedite initiation of the program."

We had thought that in the reorganization of last year the assignment of administrative responsibility to the College of William and Mary to arrange for the offering of resident graduate credit courses at VARC could result in important progress in supplying the need we have so frequently expressed. The impression we have obtained from recent events, however, does not warrant this optimism. Our current understanding is that graduate level educational opportunities in engineering from Virginia institutions in this area will probably continue to be limited to extension course status as they have for so many years.

This situation is, of course, a matter of serious concern to the Langley Research Center and the entire community. While some students will be able to leave this area for an extended period to complete resident requirements for a degree, many others will not. It is unfortunate that we have not succeeded in developing the original VARC educational concept into a working pattern. It was our view in this concept that the State-controlled VARC site would provide an economical centralization of resources of the Virginia educational system in an area having a well defined and growing need and with an effective association with very extensive laboratory facilities to support graduate programs in science and engineering.
Another thought pertains to the use of the surplus land obtained for the VARC site. Without execution of the planned development of this site for educational purposes, I would expect the U.S. Government to require its return to their custody for disposal. We believe the SREL site is large enough so that developments on adjacent property will not jeopardize the use and effectiveness of that facility. Your thoughts on this matter would be appreciated.

We do feel fortunate that other means of meeting the obligation we owe to the Langley Research Center employees in providing opportunities for graduate resident engineering seem to be in the making. George Washington University has recently offered to expand their existing resident graduate educational opportunities in this area to include engineering subjects. We currently are in progress of negotiations with them for plans to start graduate courses this coming September. The development of such an affiliation with the Langley Research Center has important advantages to the Engineering College of George Washington University as well as to the Langley Research Center so we are optimistic regarding the prospects for a mutually satisfactory arrangement. Educational opportunities that result from this arrangement will, of course, be available to the entire community.

Although we expect to be successful in arranging for graduate residence education with George Washington University, I would hope that such success will not deter the College of William and Mary from continuing their efforts to arrange for the offering of resident graduate engineering courses from Virginia institutions. I think this area would profit greatly from the breadth of educational opportunities presented and, in addition, the educational capabilities of the Virginia institutions would be greatly strengthened.

In summary, therefore, the reorganization has been successful in dealing with a problem of administration that had become acute. On the other hand, the development of needed opportunities for graduate education in this area still seems to lag seriously. We feel that George Washington University will be able to do a very creditable job but it does seem as though Virginia institutions should play a more important role.

An expression of your thoughts relative to this matter would be appreciated.

Yours truly,

Floyd L. Thompson
Special Assistant to NASA Administrator

cc:
The Honorable Mills E. Godwin, Jr.
Governor of Virginia
State Capital
Richmond, Virginia 23219
July 16, 1968

Dr. Davis Y. Paschall
President
The College of William and Mary
Williamsburg, Virginia 23185

Dear Doctor Paschall:

We regret that our comments on the William and Mary Physics Program in our "Comments on Summary Analysis - Virginia Associated Research Center" have been misconstrued. No attack on the quality of the William and Mary Physics Program was intended. All our information indicates that the William and Mary Physics Program is of a high calibre in the areas covered. Our comments were not directed to the quality of the program; but to its breadth. It is our information that the William and Mary Physics faculty are specialists in high-energy physics. We are advised that the memorandum you attached to your letter of June 26, 1968, tends to confirm these observations.

Yet, this is not regarded by us as impugning the quality of the Physics Program that is offered. As the frontiers of science expand daily, we merely wish to point out the critical need for higher education in Virginia is to broaden the scope of graduate scientific education and the unique capability of VARC to attain this goal. Certainly as good as the William and Mary Physics Program is, it could be broader by use of the capabilities of the University of Virginia, Virginia Polytechnic Institute and Old Dominion College as each institution has a different competence. No single institution has the capability for a total physics, or other scientific, program equal to what the combined, cooperative efforts of all on a coordinated basis could achieve.
To us, it is most unfortunate that a stated concern to avoid duplication of programs ignores the essential element of proper breadth of program and the availability of programs where it will reach the greatest number at the least cost. Surely, the VARC concept if allowed to function could broaden the capability of higher scientific education in Virginia by utilizing the capabilities of several institutions beyond the capability of any single institution. All that is lacking at VARC is that degree of institutional cooperation necessary to make it what it could be, should be, and what the Commonwealth committed it would be.

It is to us ludicrous that a professor commutes from the Space Radiation Effects Laboratory (SREL) to the campus of William and Mary to teach students who commute from Langley Research Center, who pass VARC enroute. That this is done when the $16,000,000 laboratory that supports the William and Mary Physics Program is adjacent to VARC and when failure to offer resident graduate programs at VARC leading to a degree is a breach of the solemn commitment of the Commonwealth when VARC was created, makes this more than ludicrous.

Why the 116 NASA-Langley students in your Physics Program should not be permitted to take their courses at VARC and have the support of the other participating institutions in making available a broader offering and thereby attracting a significant number of additional students is beyond our comprehension.

If what we contend for has not been made clear to you to this point we would like to briefly state it here. We only ask that the Commonwealth honor its commitments and permit VARC to function as it was intended. To do this we merely ask that any participating institution be free to seek approval of the Southern Association of Colleges and Schools to confer degrees upon students taking courses at VARC where they meet the standards of participating colleges and
Dr. Davis Y. Paschall

universities, and that courses be offered at VARC which would meet the need and demand.

With best wishes, we are

Sincerely yours,

Hunter B. Andrews

Richard M. Bagley

Herbert H. Bateman

Alan A. Diamonstein

John D. Gray

Lewis A. McMurrynan, Jr.

T. V. Morrison, Jr.

cc: Honorable Mills E. Godwin, Jr.

Dr. Floyd L. Thompson

Dr. Prince B. Woodard
July 9, 1968

The Right Honorable Mills E. Godwin, Jr.
Governor of Virginia
State Capitol
Richmond, Virginia

Dear Governor Godwin:

In the following I take the liberty to address myself to you concerning the present situation and the future development of the Virginia Associated Research Center. The recent publications in the press of which I enclose one example describing the presentation of courses and the offering of degrees on the Peninsula by the George Washington University clearly proves that proper attention has not been given to the needs and requirements of this area and that the management of the Virginia Associated Research Center failed to understand the role which this educational and research center could have played.

As a former director of the Space Radiation Effects Laboratory, a member of the Virginia Associated Research Center faculty, and a faculty member of the University of Virginia, I am deeply concerned about the fate of this organization, its position in the State educational system and its name, its standing and its appreciation in the scientific community of this country. Being a scientist, I have so far preferred to stay outside of any political discussion.

The legislative action which established VARC showed great foresight and it opened many perspectives for the State and for this area in making possible a process of research and educational cooperation which was analogous to several modern developments between educational institutions in more progressive areas. The concept of VARC was based on scientific and educational needs and opportunities. However, the subsequent developments seem to have been based on political reasonings. Shortly after my arrival, I observed that the cooperation between the participants left much to be desired. In particular, the College of William and Mary preferred to take advantage of its proximity to the Center, meanwhile fearing that a major scientific development at VARC could obstruct any growth of the College at Williamsburg instead of foreseeing that the scientific departments of the College would benefit greatly from any development of national importance here.

The reorganization of last year made impossible any cooperative effort. It disregarded the needs of this area and of the State as a whole in cancelling all the former agreements. The original charter, as it was interpreted by all concerned, could have had the following effects:

In Co-operation • COLLEGE of WILLIAM and MARY • MEDICAL COLLEGE of VIRGINIA
UNIVERSITY of VIRGINIA • VIRGINIA POLYTECHNIC INSTITUTE
1) It would have been beneficial to attract students out of the working population of this area. A cooperative program attracts more students than single extension courses.

2) A larger faculty and probably a faculty of high caliber could have been attracted than that what would have been possible to attract to each school individually.

3) This faculty would have been available to the schools. In addition, a good faculty attracts good students; this is a self-perpetuating process.

4) Fields of study could have been initiated which are not taken up in any of the Virginia schools.

5) SREL, with a powerful in-house capacity, could have operated like one of the National Laboratories. It would have extended its facilities and it would have been in a position to attract interest from the U. S. Atomic Energy Commission and other Federal Agencies.

Last years development resulted in the following:

1) The organization favors strongly the colleges in commuting distance.

2) No physics courses can be offered on a cooperative basis and the engineering courses are severely limited.

3) The poorly defined status of VARC made impossible the attraction of additional faculty.

4) The limited scope and personality problems with the William and Mary direction of SREL induced several good people to leave this area and less capable people were promoted to high academic ranks.

5) NASA-Langley lost much interest in VARC and consequently George Washington University offerings were accepted, diminishing any significance of VARC.

6) NASA also lost interest in SREL. It has been stated that present budgetary considerations may lead to the cancellation of the SREL contracts. The interest of any other government agency in SREL is minimal partial as a consequence of the problems around SREL.

7) One more year of equal inactivity and uncertainty will induce most faculty members of the University of Virginia and of Virginia Polytechnic Institute to leave this area.

All those interested in a continuation of VARC and SREL would like to see a change in the present situation and a reestablishment of the original charter. At this time, a reactivation of VARC is still possible. It would be presumptuous on my part to propose changes in organization and management. However, it has been a public feeling that the University of Virginia possesses the objective distance, the impartial attitude, the capacity, and the capability to operate this center in the philosophy of the original charter. NASA never expresses its attitude openly because that organization contracted with the State and NASA does not want to prescribe or dictate how a contractor should operate its business. Therefore, the reorganization should come from the State of Virginia on the grounds of maxi-

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3 - Honorable Mills E. Godwin, Jr.

... mum returns in terms of education and research. An active educational and research center supported by the State institutions of higher learning which can make use of facilities provided by NASA will ultimately attract other Federal funds and contracts, and it will contribute to all the participating institutions. All of us concerned with the future of VARC look forward to your action.

I remain, dear Governor, your obedient servant.

Respectfully,

P. C. Gugelot
Professor of Physics
University of Virginia

Enclosure

cc: Dr. Floyd L. Thompson
    Herbert H. Bateman
Ms. Elizabeth B. Ward
917 Etna Drive
Newport News, VA 23602

Dear Ms. Ward:

I respond to your letter of March 8, 1993 regarding the Virginia Associated Research Center (VARC). Unfortunately, the copies of the two letters you enclosed do not jog my memory to the extent that I can be helpful.

It is accurate that there were significant "turf" considerations that embarrassed VARC as an institution operated by a consortium of institutions.

William and Mary was anxious to protect its graduate program in Physics. Other institutions were concerned that resources devoted to doctoral studies in science and engineering would siphon off state resources from such graduate programs at Virginia Polytechnic Institute/State University and the University of Virginia. Hence, the good or the evil is largely in the eye of the beholder.

Clearly, I developed a concern as to residency requirements of institutions which were a part of the consortium and how they would impact upon the program at VARC--especially in the context of an out of state university which had no residency requirements coopting the pool of potential enrollees.

I am sorry I cannot be more helpful.

With kind regards, I am

Sincerely yours,

Herbert H. Bateman
Member of Congress

HHB/gpn

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Ms. Elizabeth B. Ward
917 Etna Drive
Newport News, Virginia 23602

Dear Ms. Ward:

I read with great interest your recent letter concerning the 1968 controversy over graduate education at VARC.

You certainly have done your research. With the hindsight of some twenty-six years and with some memory, I do recall our concern that the NASA-Langley students in physics were not permitted to take courses at the Virginia Associated Research Center because they were not resident students.

I recall the ridiculous nature of the Southern Association of Colleges and Schools that had a residence requirement and the fact that George Washington University was not a member of the Southern Association of Colleges and Schools but was a member of the Atlantic Association and moved to Hampton and to this day operates a graduate program for persons at NASA and others in the region.

I am also conscious of the fact that at the time the late Dr. Prince Woodard who was then Director of the State Council of Higher Education was very vehement in his opposition to the granting of graduate degrees without residency.

I hope my recollections are of some help and I certainly do hope my memory is correct.

May I wish you the best of luck in writing your doctoral dissertation.

Sincerely,

Hunter B. Andrews

HBA:kjh
APPENDIX G

UVA PROPOSAL

CIRCA 1961

284
A PROPOSAL FOR THE OPERATION OF NASA ACCELERATOR

It is proposed that the University of Virginia act as prime contractor for the operation of the NASA 600 Mev synchro-cyclotron facility to be erected near the Langley Laboratories of NASA. In accepting this responsibility the University undertakes to make the necessary land available to NASA for the facility, to employ the necessary operating and housekeeping personnel, to perform the usual contracting and financial duties and to undertake the operation of the facility as a research and educational facility with the understanding that a specified portion of the accelerator time will be designated for use by NASA.

In undertaking the primary responsibility for the operation of this facility it is understood that cooperative use by neighboring institutions of higher learning is anticipated, and such use is reflected in the organization of the Administrative Advisory Committee.

The operation of the facility by the University of Virginia would attach the facility to an established Physics Department with high competence and an international reputation in this particular field of physics. Not only would this add prestige to the facility itself, but it would assure that its operation would be guided in a competent manner so that the maximum scientific and educational advantage to both NASA and the State of Virginia could be realized. Operation by the University of Virginia would open the way for the further development of a graduate instructional and research center adjacent to the Langley Laboratories. Under the proposed plan of operation graduate students in physics and engineering, as well as other schools and departments, such as medicine, biology and chemistry, would receive residence credit for course and research work done at this facility and applied towards an advanced degree at the University of Virginia. As the center develops, it may be expected that graduate work in other sciences will be offered. Possible participating disciplines are biology, chemistry, geology and medicine.

The full realization of such graduate study and research potential requires administration of the facility by a fully qualified faculty such as that available at the University of Virginia. Members of the faculty of the Physics Department of the University have had extensive experience in high energy physics research and have an active research program in nuclear physics. Furthermore, there are highly competent supporting faculties in mathematics, chemistry, biology, medicine and engineering. The effect of high energy radiation on biological tissue is the subject of an active research program in the bio-physics department of the School of Medicine and the Physics Department. Thus, there is available a faculty and graduate student body to begin effective utilization of the facility as soon as it is completed. The University expects to expand its staff and student body in this field when the additional research facility is available.

The University of Virginia has experience in the operation of a scientific facility for research and graduate instruction at a distance from Charlottesville. The Blandy Farm of the Biology Department is located approximately 100 miles from Charlottesville and has an active research program with graduate students doing residence work there towards the Ph.D. degree at the University. Thus, it is an excellent analog of the proposed accelerator facility operation.

A plan of operation of a facility intended to enhance research and higher education in Virginia should be compatible with the overall plan of the State for
graduate instruction. The operation of this facility by the University of Virginia is in accord with this state program, and the University understands it will have the endorsement of the State Council on Higher Education. Any new program of graduate instruction or instruction at a new facility by any state institution must be referred to the State Council on Higher Education for approval and recommendation to the Governor and General Assembly. Thus, if the University of Virginia is assigned the operation of the facility, the University can marshal support for the facility from both officials within the state and its representatives and friends in Washington.

A proposed organization to administer this operation consists of a director, scientific staff, operating staff, administrative advisory committee and scientific review committee. The director of the facility will be a member of the faculty of the Physics Department of the University of Virginia. Other faculty members from the University will be active in the research and instructional program. The director of the facility will be a physicist with special competence in this area and will be appointed by the University of Virginia with advice of the Administrative Advisory Committee.

The Administrative Advisory Committee will consist of:

- 2 members from the University of Virginia
- 3 members from NASA
- 1 member each from VPI and William and Mary
- 2 outside members with experience and competence in the operation or use of comparable facilities
- Director of the Facility, ex officio

The University will designate one member of the committee as chairman.

As its name implies, this committee will serve to advise the director and through him the administrative officials of the University on matters concerning the operation and use of the facility. An early obligation of this committee will be the recommendation of a director of the facility. Institutions other than the prime contractor are represented on this committee so they may have a voice in the planning of the operation.

The Scientific Review Committee will be a visiting committee and will consist of:

- 5 members appointed by the University of Virginia with the advice of the Administrative Advisory Committee
- Director of the Facility, ex officio

This committee will advise with the Director on matters relating to the scientific program being carried out with the facility.

The details of the employment of operating personnel can be worked out in normal fashion through the present personnel and financial offices of the University of Virginia. The contractual details of cost reimbursement and similar matters will need to be the subject of negotiations. The broad framework of present thinking of NASA on this was presented in the conference of November 27.
BIBLIOGRAPHY


Vita

Elizabeth Buchanan Ward

Birthdate: December 22, 1953

Birthplace: Ronceverte, West Virginia

Education:

1993 The College of William and Mary
Williamsburg, Virginia
Doctor of Education

1991 The College of William and Mary
Williamsburg, Virginia
Specialist in Higher Education

1989 The College of William and Mary
Williamsburg, Virginia
Master of Arts in Education

1975 East Carolina University
Greenville, North Carolina
Bachelor of Arts in Chemistry

Professional Experience:

1987 - 1993 Thomas Nelson Community College
Hampton, Virginia
Division of Natural Sciences and Mathematics, Science Instructor

1988 - 1992 The College of William and Mary
School of Education
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Graduate Assistant

1977 - 1978 Pitt County Community College
Department of Nursing
Greenville, North Carolina
Science Instructor

1975 - 1977 East Carolina University
Department of Chemistry
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Graduate Teaching Assistant

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1975 - 1977  East Carolina University
Department of Chemistry
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Professional Organizations:
American Association for the Advancement of Science
American Association for Higher Education
East Carolina University Chemistry Alumni Society
National Science Teachers Association, College Division

Awards and Special Recognitions:
Kappa Delta Pi Education Honor Society, The College of William and Mary Chapter, 1989
Outstanding Senior Woman Student, East Carolina University Chemistry Department, 1975
Pi Kappa Phi Honor Fraternity, East Carolina University Chapter, 1974

Publications: