TO: NASA Headquarters  
Attn: RI/Director for Institutions  
FROM: 103A/Deputy Director  
SUBJECT: Summary Preliminary Langley Research Center FY'89 Major CoF Submittal

Enclosed are advance copies of the standardized formats of LaRC's FY'89 Preliminary Major CoF Submittal, as requested in your September 12, 1986, letter. LaRC is proposing that five Major CoF Projects be funded in FY'89:

1. Construction of Supersonic Low-Disturbance Tunnel (1247D) $5.2M  
2. Modifications to Upgrade Hypersonic Aerothermal Complex (1247, 1251, 1275) 9.4M  
3. Modifications for Electromagnetics Scattering Laboratory (1299) 16.2M  
4. Modifications to 4-By 7-Meter Low-Speed Tunnel for Aeroacoustic Research (1212C) 10.5M  
5. Modifications for Space Flight Experiment Development Facility (1250) 6.0M  
$47.3M

The first project is a high-priority carry over from FY'88. The second project complies with your September 12, 1986, emphasis on improving the reliability and productivity of those existing facilities which are of great programmatic interest. The third project, "Modifications to Upgrade Electromagnetics Scattering Laboratory (1299)", provides an exciting new opportunity for NASA. The remaining two projects provide new capability to allow LaRC to meet major Agency and National research objectives.
Copies of the package for the fifth project are also being sent to OSS and OSSA since this project also supports missions for these codes.

Paul F. Holloway

5 Enclosures

cc:
NASA - NX/B. J. McGarvey
NASA - NXF/F. X. Durso
NASA - NXF/A. L. Farrow
NASA - E/B. I. Edelson
NASA - S/A. J. Stofan
NASA - EPI/H. H. Ellis, Jr.
LeRC - 3-8/J. W. Gregory
ARC - 213/C. R. Castellano
101/General Files
106/Director
103/Director Assistant
117/W. D. Mace
118/C. R. Blankenship
116/R. V. Harris
107/R. R. Nunamaker
111/J. F. Stokes
113/J. F. Creedon
112/R. L. Swain
112/R. T. Wingate
112/J. R. Dinkins
436/J. E. Kneemeyer
104/A. C. Massey
104/A. C. Fitzgerald
104/T. E. Caldwell
446/FPDO Files

KRC446/KRCredert:jrn 10-15-86 (3467)

446/CRS KRC f CRS
112/RLS
MODIFICATIONS TO UPGRADE HYPersonic FACILITIES COMPLEX
FY 1989 - LARC

REQUIREMENT:

0 ENSURE ADEQUATE FACILITIES FOR CONTINUING HYPersonic AERODYNAMIC AND AEROThERMODYNAMIC RESEARCH CAPABILITY TO SUPPORT DEVELOPMENT OF NATION'S AEROSPACE VEHICLES (MASP, AOTV, TAV, BGV, SHUTTLE II)

WHY NOW:

0 RENEWED INTEREST IN HYPersonics BECAUSE OF NEWLY INITIATED MAJOR PROGRAMS
0 STEADY DECLINE IN NUMBER AND OPERATION OF NATIONAL HYPersonic WIND TUNNELS SINCE LATE 1960's
0 ONLY NASA ACTIVE COMPLEX PERFORMING HYPersonic AERODYNAMIC AND AEROThERMODYNAMIC RESEARCH ON ADVANCED AEROSPACE CONFIGURATIONS
0 25-YEAR-OLD AVERAGE AGE OF WIND TUNNELS IN COMPLEX
0 IMPROVED FLOW QUALITY, RELIABILITY, PRODUCTIVITY, AND CAPABILITY TO PROVIDE UNINTERRUPTED HYPersonic TEST SUPPORT

DESCRIPTION:

0 MODIFICATIONS FOR NEW TUNNEL NOZZLES, MODEL ACCESS AND SUPPORT SYSTEM, AND VACUUM SYSTEM
0 REPLACEMENT/RENOVATION OF HEATERS/HEATER BUNDLES AND MODEL INJECTION SYSTEMS
0 REHABILITATION OF FLOW CONTROL VALVES, PANELS, CONTROL ROOMS, AND REFRIGERATION SYSTEM
0 INSTALLATION OF IN-LINE FILTERS

CONCEPTUAL STATUS:

0 $76K PRELIMINARY ENGINEERING REPORT (PER) NEEDED FOR INCREASED VACUUM PUMPING CAPABILITY ($1.6M) AND TUNNEL MODIFICATIONS ($2.2M) PROPOSED SINCE 1984; PER ON REMAINING PROJECT COMPLETED 7/84

ESTIMATED COST: $9.6M

R&D FUNDING: NONE
O&M REQUIREMENTS: CIVIL SERVICE FTE 0
SUPPORT CONT. NYE 0
UTILITY COSTS $12K/yr
MAINT. COSTS 0

OCTOBER 10, 1986
BACK-UP INFORMATION

LARGE MODIFICATIONS TO UPGRADE HYPERSONICS FACILITIES COMPLEX

PRIOR BUDGET STATUS: submitted FY'87 with $2.7M phase I in FY'87 and $3.9M phase II in FY'88

SCHEDULES:        BEGIN       END
REMAINING PER:  2Q FY'87  4Q FY'87 DESIGN:  2Q FY'88  1Q FY'89 CONST:  2Q FY'89  2Q FY'91

CRITICAL PROGRAMMATIC MILESTONES:

NASP, AOTV

ALTERNATIVES:

0 DELAY NASP, AOTV, AND OTHER MAJOR HYPERSONICS PROGRAMS
0 BUILD NEW FACILITIES AT MANY TIMES UPGRADE COST

FUTURE REQUIREMENTS/FOLLOW-ON ACTIONS: NONE ANTICIPATED

CoF PROJECT MANAGER
ADVOCATES/STATUS
CENTER:                                      J. E. COUTTS
HQS:                                        C. L. W. EDWARDS
OTHER:                                      R. A. GRAVES, JR.

NATIONAL AERO-SPACE
PLANE, AIRFRAME
CONTRACTORS, AIR
FORCE

OCTOBER 5, 1986
### SAMPLE TEST MATRIX
**SUPPORTED BY LARC HFC**

<table>
<thead>
<tr>
<th></th>
<th>AOTV</th>
<th>ARC BRAKE</th>
<th>AMOOS/RAKED CYLINDER</th>
<th>BENT BICONIC</th>
<th>GRUMMAN DERIVATIVE</th>
<th>DEPLOYABLE GD/MMC</th>
<th>BOEING BALLUTES</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>AFE/JSC</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ADVANCED STS</td>
<td></td>
<td>CIRCULAR FUSELAGE STT0</td>
<td>BOEING - RAV</td>
<td>R.I. TAV</td>
<td>IN-HOUSE GENERIC MASP</td>
<td>BOEING ROCKWELL</td>
<td>CLASSIFIED</td>
</tr>
<tr>
<td></td>
<td>SHUTTLE II</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>DARPA BASELINE</td>
</tr>
<tr>
<td>BGV</td>
<td></td>
<td>CLASSIFIED</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>CLASSIFIED</td>
</tr>
<tr>
<td>ERV</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>CLASSIFIED</td>
</tr>
<tr>
<td>SRV</td>
<td></td>
<td>LARC ERV</td>
<td>SRV PARAMETRICS</td>
<td></td>
<td></td>
<td>AFMAB BGV</td>
<td>GD - BGV</td>
</tr>
<tr>
<td>SHUTTLE</td>
<td>BASE DRAG</td>
<td>FUSELAGE HEATING</td>
<td>REAL GAS BODY FLAP</td>
<td>SEADS CALIBRATION</td>
<td>RCS INTERACTION</td>
<td>ASCENT LOADS</td>
<td>SEPARATION AERO</td>
</tr>
<tr>
<td>CODE VERIFICATION</td>
<td></td>
<td>ELLIPTIC CONE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>AIRBREATHING PROPULSION INTEGRATION</td>
</tr>
<tr>
<td></td>
<td>HALIS ORBITER</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>