THE CASE FOR TEAMING ON THE ALS-STME PROGRAM

AGENDA

- BACKGROUND
- VIABILITY OF INDUSTRY COMPETITIVENESS
- POLICY
- ACQUISITION STRATEGY
  - PROCUREMENT OBJECTIVES
  - TEAMING BENEFITS
- CONCLUSION/SUMMARY
BACKGROUND

ALS & STME SITUATION

- DOD BUDGET UNCERTAINTIES AND CUTS
  - PRECLUDES FY 92 ALS VEHICLE AND ENGINE FSD START
  - MAJOR CUTS TO VEHICLE STUDIES & NON PROP. ADP'S

- DOD & NASA HAVE AGREED TO PROCEED WITH A PROTOTYPE ENGINE PROGRAM IN FY-92
  - CONSISTENT WITH NASA ADV COMMITTEE RECOMMENDATIONS
  - CONSISTENT WITH DSB RECOMMENDATIONS
  - ENDORSED BY ALS SYSTEM CONTRACTORS
  - NASA CONSIDERING SIGNIFICANT BUDGET SUPPORT
VIABILITY OF THE ROCKET ENGINE INDUSTRY COMPETITIVENESS

CONCERN

- USA COMPETITIVENESS IN LARGE LIQUID ROCKET ENGINES IN SERIOUS JEOPARDY
  - THIS NATION NO LONGER LEADS THE WORLD IN ROCKET ENGINE DEVELOPMENT
  - NEW LOX/LH2 ENGINES ARE UNDER DEVELOPMENT IN:
    - EUROPE (1st FLIGHT EXPECTED IN 1995)
    - JAPAN (1st FLIGHT EXPECTED IN 1995)
    - USSR (UNDER DEVELOPMENT SINCE MID 1980'S)
  - NO NEW LARGE ROCKET ENGINE DEV INITIATED IN USA SINCE 1970
# Large Liquid Rocket Engine Development Programs in the USA

<table>
<thead>
<tr>
<th>Engine</th>
<th>Thrust (KW)</th>
<th>Propellant</th>
<th>Contractor</th>
<th>Application</th>
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<td>S-3</td>
<td>150k</td>
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* NOTE: THIS A STRICTLY COMMERCIAL ENGINE DEVELOPED FOR GENERAL DYNAMICS COMMERCIAL ATLAS/CENTAUR PROGRAM.

# Conclusion:

Competitiveness of the three (3) large liquid engine contractors in the USA seriously eroded since the 1960's.
• COMETITION WITHIN USA ON LARGE LIQUID ROCKET ENGINES IN SERIOUS JEOPARDY

- OF THE THREE RECOGNIZED ENGINE PRIME CONTRACTORS...
  - ONLY TWO HAVE RECENT LOX/LH2 ENGINE DEV EXPERIENCE
  - ONLY ONE HAS LARGE LOX/LH2 SYSTEM LEVEL EXPERIENCE

- OPPORTUNITIES FOR NEW ENGINE DEVELOPMENTS IN THE NEAR FUTURE ARE VERY LIMITED.

• OPEN COMPETITION CAN BE DETRIMENTAL TO THE BEST INTERESTS OF THE GOVERNMENT UNDER CERTAIN CIRCUMSTANCES

- WHERE BUDGETS DO NOT ALLOW FOR THE DEVELOPMENT OF MULTIPLE SOURCES AND ALTERNATE COMPETING DESIGNS, AND........

- WHERE VERY SMALL MARKETS EXISTS, AND.....

- WHERE LIMITED QUALIFIED COMPETITORS EXIST.......

- A SOLE SOURCE WILL RESULT !!!
POLICY

- SUPPORT AND PROVIDE FOR THE LARGE LIQUID ROCKET ENGINE NEEDS OF THIS NATION

- MAINTAIN A VIGOROUS ROCKET ENGINE INDUSTRY IN THE USA FOR LARGE SIZE, LATEST TECHNOLOGY LIQUID ROCKET ENGINES.
  - KEEP USA FROM RELINQUISHING ITS PREEMINENCE IN LARGE LIQUID ROCKET ENGINES.
  - ALLOW USA TO BETTER COMPETE IN THE INTERNATIONAL COMMERCIAL ARENA.
  - AVOID POTENTIAL DEPENDENCY ON OTHER NATIONS FOR OUR NEXT GENERATION OF LARGE LIQUID ROCKET ENGINES.
• CONDUCT AN STME PROTOTYPE ENGINE PROGRAM THAT:
  • PROVIDES FOR THE LARGE LIQUID ROCKET ENGINE NEEDS OF THE NATION
  • MINIMIZES FULL SCALE DEVELOPMENT COST AND SCHEDULE OF NEXT GENERATION LARGE LIQUID ROCKET ENGINE
    - SIMILAR DOD/AF PROTOTYPE APPROACHES HIGHLY SUCCESSFUL (ie. F-16)
  • FACILITATES SYNERGISM BETWEEN THE PARTICIPATING CONTRACTORS TO OBTAIN THE BEST AND UNIQUE IDEAS, CAPABILITIES, AND TECHNOLOGIES LEADING TO THE BEST OVERALL DESIGN.
  • PRECLUDES A SINGLE CONTRACTOR FROM BECOMING A FUTURE "SOLE SOURCE".
    - AVOID A "WINNER TAKE ALL" PROCUREMENT APPROACH.
ACQUISITION STRATEGY

PROCUREMENT OBJECTIVE

- IMPLEMENT TEAMING NOW ON THE EXISTING ARRAY OF PHASE B, AND ADP CONTRACTS.
  - TEAM AEROJET, PRATT & WHITNEY, AND ROCKETDYNE
  - USE TEAM TO FACILITATE ENGINE CYCLE DECISION
  - USE TEAM TO HELP RESTRUCTURE TOTAL PROGRAM TO ARRIVE AT AN INTEGRATED PLAN CONVERGING TO A PROTOTYPE ENGINE DESIGN.

- CONDUCT THE PROTOTYPE PROGRAM WITH TEAM OF THE 3 STME PRIME CONTRACTORS.
  - AWARD CONTRACT IN FY-92 TO TEAM OF AEROJET, PRATT & WHITNEY, AND ROCKETDYNE
  - PROTOTYPE PROVIDES PROOF OF CONCEPT
**BENEFITS OF TEAMING**

- Maintains a vigorous industry for large liquid rocket engines in the USA.
- Retains USA's preeminence and leadership in the field.
- Makes USA more competitive in the international arena.
- Avoids single contractor from becoming a sole source for large liquid rocket engines.

- Enhances competition for the future.

**BENEFITS OF TEAMING (cont'd)**

- Within the budget constraints, teaming has the potential for the best product at reduced development costs.
- Synergism of the prime companies and gov't work.
- Avoids contractors withholding best ideas and technologies because of the competitive environment.
  - Allows best component designs to emerge within best engine system design.
  - Consistent with ALS total quality management req't.
  - Allows early convergence to a single engine design.
  - Eliminates duplication of efforts at the 3 contractors.
CONCLUSION/SUMMARY

• THE NATION NEEDS TO PROCEED WITH A NEW LOX/LH2 ROCKET ENGINE PROGRAM NOW!

• OPEN COMPETITION NOW WILL HAVE DELETERIOUS IMPACTS ON THE COMPETITIVE VIABILITY OF THE LIQUID ROCKET ENGINE INDUSTRY

• TEAMING PROVIDES A WAY TO SOLVE TODAY'S CONCERNS WHILE ENHANCING THE OPTION FOR OPEN COMPETITION IN THE FUTURE