THE CASE FOR TEAMING ON THE ALS-STME PROGRAM

AGENDA

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

STME

PROTOTYPE PROGRAM

George C. Marshall Space Flight Center

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

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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
### ENGINE DEVELOPMENT PROGRAMS IN THE USA

<table>
<thead>
<tr>
<th>ENGINE</th>
<th>THRUST</th>
<th>PROPELLANT</th>
<th>CONTRACTOR</th>
<th>APPLICATION</th>
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<td>S-II/S-IVB</td>
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* NOTE: THIS A STRICTLY COMMERCIAL ENGINE DEVELOPED FOR GENERAL DYNAMICS COMMERCIAL ATLAS/CENTAUR PROGRAM.

### LARGE LIQUID ROCKET ENGINE DEVELOPMENT PROGRAMS IN THE USA

<table>
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<tr>
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CONCLUSION: COMPETITIVENESS OF THE THREE (3) LARGE LIQUID ENGINE CONTRACTORS IN THE USA SERIOUSLY ERODED SINCE THE 1960'S.
• COMPETITION 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 govt 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