Office of
Aeronautics,
Exploration and
Technology

Fact Sheets:
Element Characterization
and Funding Schedules

SPACE PROPULSION TECHNOLOGY PROGRAM OVERVIEW

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PROGRAM ELEMENT MATURITY, EXTENT PLANNED

OAET — SPACE PROPULSION

Focused Program Elements

TRANSPORTATION

- Earth-to-Orbit Propulsion
- Commercial Vehicle Propulsion
- Auxiliary Propulsion
- Advanced Cryogenic Engines
- Cryogenic Fluid Systems
- Nuclear Thermal Propulsion
- Nuclear Electric Propulsion

SPACE PLATFORMS

- Spacecraft On-Board Propulsion
- Station Keeping Propulsion

TECHNOLOGY FLIGHT EXPTS

- Cryogenic Orbital N2 Expt (CONE)
- SEPS Flight Experiment
- Cryogenic Orbital H2 Expt (COHE)

Base R&T

- Low Thrust Propulsion (Primary & Aux)
- Advanced Propulsion Concepts
- High-Thrust Chemical Propulsion
- Cryogenic Fluid Management
- Lunar and Planetary Propellants

- ■ Ongoing, Extensively Planned (With Updating)
- ▣ Recent-start, Planning Mostly Underway
- □ Prospective, Basically Unplanned

FOCUSED PROGRAMS FUNDING
($M)

OAET — SPACE PROPULSION

PROGRAM ELEMENT		FY1991	FY1992	FY1993	FY1994	FY1995	FY1996	FY1997
ETO PROPULSION	Current	21.8	28.7	33.9	25.1	26.4	27.6	28.8
	3X	21.8	28.7	33.9	25.1	26.4	27.6	28.8
	Strategic	21.8	28.7	33.9	35.4	36/9	42.7	45.1
COMMERCIAL VEHICLE PROPULSION	Current	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	3X	0.0	4.2	10.0	17.0	23.0	29.0	28.8
	Strategic	0.0	0.0	12.0	15.0	44.1	57.7	47.1
AUX PROPULSION	Current	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	3X	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Strategic	0.0	0.0	0.0	2.3	5.4	10.9	15.9
ADV CRYO ENGINE	Current	4.0	9.0	12.6	13.2	14.0	14.7	15.4
	3X	4.0	9.0	14.9	16.7	19.6	20.2	28.0
	Strategic	4.0	9.0	15.0	24.0	31.0	45.8	42.4
CRYO FLUID SYSTEMS	Current	1.5	0.0	0.0	0.0	0.0	0.0	0.0
	3X	1.5	0.0	7.4	10.0	10.3	10.8	10.0
	Strategic	1.5	0.0	8.5	11.0	11.3	11.8	11.0
NUCLEAR THERMAL	Current	0.5	5.0	13.0	22.0	39.0	50.3	52.6
	3X	0.5	5.0	13.0	22.0	39.0	50.3	52.6
	Strategic	0.5	5.0	13.0	22.0	39.0	50.3	83.0
NUCLEAR ELECTRIC	Current	0.0	2.0	6.0	15.9	23.0	26.0	27.2
	3X	0.0	2.0	6.0	15.9	23.0	26.0	27.2
	Strategic	0.0	2.0	6.0	15.9	23.0	26.0	45.0

FOCUSED PROGRAMS FUNDING (Cont'd)
($M)

OAET — SPACE PROPULSION

PROGRAM ELEMENT		FY1991	FY1992	FY1993	FY1994	FY1995	FY1996	FY1997
STATION-KEEPING PROPULSION	Current	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	3X	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Strategic	0.0	0.0	2.9	4.4	3.6	0.9	0.0
S/C ON-BOARD PROP	Current	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	3X	0.0	0.0	1.0	3.0	4.3	1.2	0.0
	Strategic	0.0	0.0	1.2	3.0	4.3	1.2	0.0
CONE FLT EXPT	Current	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	3X	0.0	0.0	3.3	14.8	23.5	26.0	27.2
	Strategic	0.0	0.0	3.4	19.4	24.6	25.0	14.5
SEPS FLT EXPT	Current	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	3X	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Strategic	0.0	0.0	6.3	11.6	11.5	7.6	0.9
COHE FLT EXPT	Current	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	3X	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Strategic	0.0	0.0	0.0	0.0	0.0	3.6	17.0
TOTALS	Current	27.8	44.7	65.5	76.2	102.4	118.6	124.0
	3X	27.8	44.7	83.7	117.5	163.1	182.1	194.3
	Strategic	27.8	44.7	102.2	164.0	234.7	283.5	321.9

PROPULSION R&T BASE FUNDING

($M)

OAET — SPACE PROPULSION

SUB-ELEMENTS		FY1991	FY1992	FY1993	FY1994	FY1995	FY1996	FY1997
LOW THRUST PROPULSION	Current	5.8	5.2	5.4	5.6	5.8	6.1	6.3
	3X	5.8	5.2	7.0	9.8	11.0	12.5	14.5
	Strategic	5.8	5.2	8.0	11.0	11.0	12.5	14.5
ADVANCED CONCEPTS	Current	1.2	1.4	1.5	1.5	1.6	1.6	1.7
	3X	1.2	1.4	3.2	4.0	4.7	5.0	6.0
	Strategic	1.2	1.4	3.5	4.0	4/7	5.0	6.0
HIGH-THRUST CHEMICAL	Current	3.5	3.5	3.6	3.8	3.9	4.1	4.3
	3X	3.5	3.5	4.0	5.5	6.6	7.1	7.4
	Strategic	3.5	3.5	4.8	6.1	7.4	8.2	9.2
CRYO FLUID MANAGEMENT	Current	1.5	2.6	2.0	2.1	2.2	2.2	2.3
	3X	1.5	2.6	2.1	2.2	2.3	2.4	2.5
	Strategic	1.5	2.6	2.1	2.2	2.3	2.4	2.5
SUB-ELEMENT TOTALS	Current	12.0	12.7	12.5	13.0	13.5	14.0	14.6
	3X	12.0	12.7	16.3	21.5	24.6	27.0	30.4
	Strategic	12.0	12.7	18.4	23.3	27.4	31.2	36.2
PROGRAM SUPPORT	Current	2.4	2.5	2.6	2.7	2.8	2.9	3.0
	3X	2.4	2.5	2.3	2.6	3.0	3.2	3.6
	Strategic	2.4	2.5	2.3	2.9	3.4	3.8	4.4
SPECIAL REQUIREMENTS	Current	0.4	1.5	2.1	2.3	2.5	2.8	3.0
	3X	0.4	1.5	1.8	2.1	2.5	2.7	2.9
	Strategic	0.4	1.5	2.3	2.5	2.9	3.0	3.3
TOTALS	Current	14.8	16.7	17.2	18.0	18.8	19.7	20.6
	3X	14.8	16.7	20.4	26.2	30.1	32.9	36.9
	Strategic	14.8	16.7	23.0	28.7	33.7	38.0	43.9