National Aeronautics and
Space Administration

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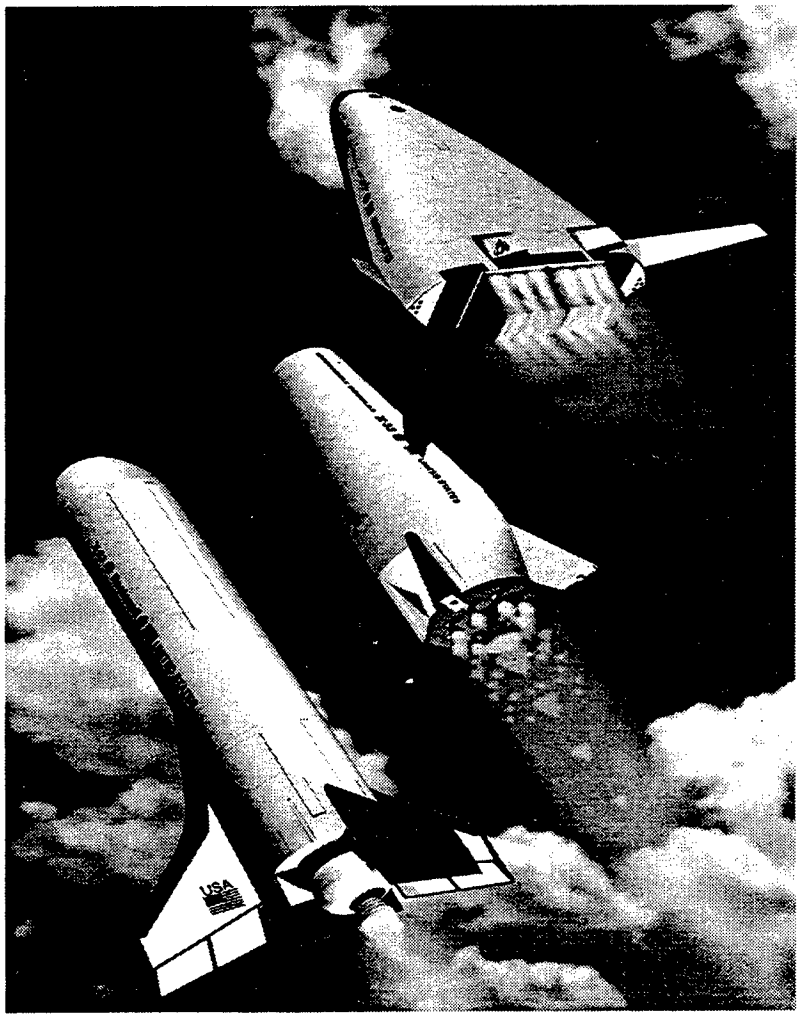
X-33

Programmatic Environmental Assessment: Vehicle and Technology Demonstration Concepts



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Abstract

The purpose of this Environmental Assessment (EA) is to support the program continuation decision and proposed action to initiate the design/demonstration phase (Phase II) of an Advanced Technology Demonstrator Vehicle, Experimental-Thirty Three (X-33) as part of NASA's Reusable Launch Vehicle (RLV) Technology Program. The Program will implement the National Space Transportation's policy designed to support Government and private sector decisions by the end of the decade on development of an operational, next-generation reusable launch system. Phase II consists of final design, fabrication, assembly, and test of the X-33. Technical, logistics, operations, and business plans proposed by offerors in response to NASA's Cooperative Agreement Notice (CAN) 8-3, "X-33 Phase II: Design and Demonstration," issued April 1996 (MSFC 1996) will be used by NASA to select an Industry Partner to implement Phase II.

Environmental implications of this selection are evaluated in this assessment. Issues contingent on the selection of Phase II Industry Partner will be evaluated in a second environmental document. Environmental analyses to date have identified no issues, which would preclude the selection of any of the proposed technologies. Neither were any site specific issues identified that would preclude the use of any of the three alternative sites proposed for flight operations.

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List of Abbreviations and Acronyms

45 SW	U.S. Air Force 45th Space Wing
ac	acre(s)
AF	Air Force
AFB	Air Force Base
AFFTC	Air Force Flight Test Center
AFMC	Air Force Materiel Command
Al-Li	aluminum-lithium
APCD	Air Pollution Control District
AQCR	Air Quality Control Region
ARC	Ames Research Center
ARTCC	Air Route Traffic Control Center
AST	aboveground storage tank
AT&SF	Atchison Topeka and Santa Fe
ATCALS	Air Traffic Control and Landing Systems
AVEK	Antelope Valley East Kern (Water District)
BCWRD	Brevard County Water Resources Department
BLM	Bureau of Land Management
BMP	Best Management Practices
BMDO	Ballistic Missile Defense Organization
Btu	British thermal unit
C	celsius
C4	Command, Control, Communications, and Computer Systems
Cal-OSHA	California Occupational Safety and Health Administration
CAN	Cooperative Agreement Notice
CCAS	Cape Canaveral Air Station
CFR	Code of Federal Regulations
cm	centimeter
CNG	compressed natural gas
CNPS	California Native Plant Society
CNS	Canaveral National Seashore
CO	carbon monoxide
COE	Corp of Engineers
cps	cycles per second
dB	decibels
dBA	decibel, weighted to the A-scale
dBC	decibel, weighted to the C-scale

List of Abbreviations and Acronyms (Continued)

DC-X	Delta Clipper - Experimental
DC-XA	Delta Clipper - Experimental Advanced
DES	Digital Encryption Standard
DFRC	Dryden Flight Research Center
DNH	Division of Natural Heritage
DOD	Department of Defense
DOI	Department of Interior
DOT	Department of Transportation
DSN	Defense Switch Network
EA	Environmental Assessment
EAFB	Edwards Air Force Base
EELV	evolved expendable launch vehicle
EIS	Environmental Impact Statement
EJ	Environmental Justice
EO	Executive Order
EOD	Explosive Ordnance Disposal
EPA	Environmental Protection Agency
ER	Eastern Range
ERD	Environmental Resources Document
ES/QD	explosive safety/quantity distance
ET	External Tank
F	Fahrenheit
FAA	Federal Aviation Administration
FAR	Federal Aviation Regulations
FDEP	Florida Department of Environmental Protection
FEC	Florida East Coast
FONSI	Finding of No Significant Impact
FPL	Florida Power and Light
FSS	Fixed Service Structure
ft	feet
FTS	Federal Telephone Service
gal	gallon
GLOW	gross lift off weight
GOCO	Government-owned/Contractor-operated
gpd	gallons per day
GSE	ground support equipment
ha	hectare(s)

List of Abbreviations and Acronyms (Continued)

HDPE	high density polyethylene
HELSTF	High Energy Laser System Test Facility
Hz	hertz
ICBM	Intercontinental Ballistic Missile
IFR	Instrument Flight Rule
IIP	Instantaneous Impact Prediction
ILS	Instrument Landing System
in	inch
IRP	Installation Restoration Program
ITF	Integrated Test Facility
ITL	Integrate/Transfer/Launch
JPC	Joint Propellants Contractor
JPL	Jet Propulsion Laboratory
JSC	Lyndon B. Johnson Space Center
kg	kilogram
km	kilometer(s)
km/hr	kilometers per hour
kpa	kilopascal
KSC	John F. Kennedy Space Center
kV	kilovolt
kVA	kilovolt ampere
kWh	kilowatt hour
L	liter(s)
LaRC	Langley Research Center
lb	pound(s)
LBSC	Launch Base Support Contractor
LC	Launch Complex
L_{dn}	day-night average sound level
LeRC	Lewis Research Center
LETF	Launch Equipment Test Facility
LH_2	liquid hydrogen
LOX	liquid oxygen
Lpd	liters per day
LPS	Launch Processing System
m	meters
MDD	Mate/Demate Device
mgd	million gallons per day

List of Abbreviations and Acronyms (Continued)

MHz	megahertz
mi	mile(s)
MINWR	Merritt Island National Wildlife Refuge
mLd	million liters per day
MLP	Mobile Launch Platform
MPa	megapascal
mph	miles per hour
MSBLS	Microwave Scanning Beam Landing System
MSFC	George C. Marshall Space Flight Center
MVA	megavolt-ampere
MW	megawatts
N/m^2	Newton per square meter
NAAQS	National Ambient Air Quality Standards
NASA	National Aeronautics and Space Administration
NASP	National Aero-space Plane
NAWC	Naval Air Warfare Center
NEPA	National Environmental Policy Act
NEXRAD	Next Generation Radar
NHB	NASA Handbook
NMDGF	New Mexico Department of Game and Fish
NMFRCD	New Mexico Forestry Resource Conservation Division
NMNHP	New Mexico Natural Heritage Program
NO_2	nitrogen dioxide
NOI	Notice of Intent
NOTAM	Notices to Airmen
NPS	National Park Service
NRHP	National Register of Historic Places
NTC	National Training Center
O_3	ozone
O&C	Operations and Checkout
O&M	Operations and Maintenance
OASPL	overall sound pressure level
ORC	Orogrande Range Camp
OSHA	Occupational Safety and Health Administration
Pa	Pascal
PAFB	Patrick Air Force Base
PAMS	Permanent Air Monitoring System

List of Abbreviations and Acronyms (Continued)

PAPI	Precision Approach Path Indicator
PCA	Positive Control Airspace
PCB	polychlorinated biphenyls
PIRA	Precision Impact Range Area
PL	Phillips Laboratory
PM_{10}	particulates less than 10 microns in size
psf	pounds per square foot
psi	pounds per square inch
PVC	polyvinyl chloride
R&D	research and development
RCRA	Resource Conservation and Recovery Act
RCRC	Rhodes Canyon Range Center
RLV	Reusable Launch Vehicle
ROI	region of influence
RP	rocket propellant
RSS	Rotating Service Structure
RTTS	return to takeoff site
SCC	John C. Stennis Space Center
SCS	Soil Conservation Service
SDIO	Strategic Defense Initiative Organization
SEDAB	Southeast Desert Air Basin
SHPO	State Historic Preservation Office
SLC	Space Launch Complex
SLF	Shuttle Landing Facility
SMAB	Solid Motor Assembly Building
SO_2	sulfur dioxide
SPIF	Spacecraft Integration Facility
sq	square
SR	State Road/State Route
SRB	Solid Rocket Booster
SRC	Stallion Range Center
SSTO	single-stage-to-orbit
STP	Sewage Treatment Plant
TACAN	tactical air navigation
TECOM	U.S. Army Test and Evaluation Command
TPS	thermal protection system
TRI	Toxic Release Inventory

List of Abbreviations and Acronyms (Continued)

TSF	Test Support Facility
U.S.	United States
UHF	ultrahigh frequency
USAF	United States Air Force
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
USN	United States Navy
UST	underground storage tank
UV-B	ultraviolet-B
VAB	Vehicle Assembly Building
VAFB	Vandenberg Air Force Base
VFR	Visual Flight Rule
VHF	very high frequency
VOC	volatile organic compounds
VOR/TAC	Very High Frequency Omni Range/Tactical Air Navigational
VTHL	vertical takeoff/horizontal landing
VTVL	vertical takeoff/vertical landing
WAPA	Western Area Power Administration
WFF	Wallops Flight Facility
WL	USAF Wright Laboratories
WMA	Waste Management Authority
WSMR	White Sands Missile Range
WSNM	White Sands National Monument
WSSH	White Sands Space Harbor
WSTF	White Sands Test Facility
WWTP	Wastewater Treatment Plant
X-33	Experimental-33

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