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PHASE II FLIGHT SAFETY DATA PACKAGE FOR THE ALPHA MAGNETIC SPECTROMETER-02 (AMS-02)

Engineering Directorate

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National Aeronautics and
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Lyndon B. Johnson Space Center
Houston, Texas

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FOR THE

ALPHA MAGNETIC SPECTROMETER-02 (AMS-02)

NASA/JSC APPROVAL

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NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
LYNDON B. JOHNSON SPACE CENTER
HOUSTON, TEXAS

April 2007

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FOR THE

ALPHA MAGNETIC SPECTROMETER-02 (AMS-02)

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ACRONYMS AND ABBREVIATIONS

α	Absorptivity
A	Amp or Amps
ACC	Anti-Coincidence Counters
AFD	Aft Flight Deck
AI	Action Item
Al	Aluminum
AMICA	Astro Mapper for Instrument Check of Attitude
AMS	Alpha Magnetic Spectrometer
APCU	Assembly Power Converter Unit
APO	AMS Program Office
ASTC	AMICA Star Tracker Camera
atm	atmosphere
AWG	American Wire Gauge
BCE	Battery Charger Electronics
BFS	Backup Flight System
BMS	Battery Management System
BOL	Beginning of Life
BD	Burst Disk or Bursting Disk
Bps	Bits per second

ACRONYMS AND ABBREVIATIONS

μCi	micro Currie
C	Celsius
CAB	Cryomagnet Avionics Box
CAN	Controller Area Network
CAS	Common Attach System
cc	Cubic Centimeter
CCD	Charged Coupling Device
CCEB	Cryocooler Electronics Box
CCR	Crew Consensus Report
CCS	Cryomagnet Current Source
CCSC	Cryomagnet Control and Signal Conditioning
CDC	Cool Down Circuit
CDD	Cryomagnet Dump Diode
CFRC	Carbon Fiber Reinforced Composite
CFRT	Carbon Fiber Reinforced Thermoplastic
CGS	Carlo Gavazzi Space
CGSE	Cryomagnet (or Cryogenic) Ground Support Equipment
CHX	Cold Heat Exchanger
CLA	Capture Latch Assembly
cm	Centimeter
CMG	Control Moment Gyro
CO_2	Carbon Dioxide
CPU	Central Processing Unit

ACRONYMS AND ABBREVIATIONS

CRES	Corrosion Resistant Steel
CRISA	Computadoras, Redes e Ingeniería SA
CSP	Cryomagnet Self Protection
CSR	Customer Support Room
CU	Copper
DC or dc	Direct Current
DDRS	Digital Data Recording System
DLCM	Direct Liquid Content Measurement Device
DOE	Department of Energy
DOL	Discrete Output Low
DV	Digital (on/off) Valve
ε	Emissivity
E	Energy
e^+	positron
e^-	electron
EA	Engineering Directorate
EBCS	External Berthing Camera System
ECAL	Electromagnetic Calorimeter
EHV	ECAL High Voltage
ELV	Expendable Launch Vehicle
EMC	Electromagnetic Compatibility

ACRONYMS AND ABBREVIATIONS

EMI	Electromagnetic Interference
ESCG	Engineering and Sciences Contract Group
ESMD	Exploration Systems Mission Directorate
EOL	End of Life
ETH	Eidgenossische Technische Hochschule
EVA	Extravehicular Activity
F	Fahrenheit
Fe^{55}	Iron 55
FoV	Field of View
FPGA	Field Programmable Gate Array
FRGF	Flight Releasable Grapple Fixture
γ	Gamma Ray
G	Gauss
GeV	Giga Electron Volts
GFE	Government Furnished Equipment
GFRP	Glass Fiber Reinforced Polymer
GN&C	Guidance, Navigation and Control
GND	Ground
GPC	General Purpose Computer
GPS	Global Positioning System
G_{rms}	Gravity Root Mean Square

ACRONYMS AND ABBREVIATIONS

GSE	Ground Support Equipment
GSFC	Goddard Spaceflight Center
HBE	Hans Bieri Engineering
$\overline{\text{He}}$	Anti-helium
HP	Heat Pipe
HR	Hazard Report
HRDL	High Rate Date Link
HV	High Voltage
Hz	Hertz
IA	Implementing Agreement
ICD	Interface Control Document
ID	Inside Diameter
I/F	Interface
IFM	In-flight Maintenance
IR	Infra-Red
ISIS	International Subrack Interface Standard
ISS	International Space Station
ISSP	International Space Station Program
ITS	Integrated Truss Segment
JS	Jacobs Sverdrup

ACRONYMS AND ABBREVIATIONS

JSC	Johnson Space Center
K	Kelvin
KeV	Kilo Electron Volts
kg	Kilograms
kN	Kilo Newton
KSC	Kennedy Space Center
kW	Kilowatt or Kilowatts
L	Liter (also l)
LBBX	Laser Beamport Box
LCC	Launch Commit Criteria
LCC	Launch Control Center
LCL	Latching Current Limiter
LCTL	Laser Control Box
LDDR	Laser Diode Driver
LED	Light Emitting Diode
LFCR	Laser Fiber Coupler
LHFP	Liquid Helium Fill Port
LHP	Loop Heat Pipe
LTOF	Lower Time of Flight

ACRONYMS AND ABBREVIATIONS

µm	Micrometer
m	meter
mm	millimeter
MAGIK	Manipulator Analysis, Graphics and Integrated Kinematics
Mbps	Megabits per second
MCA	
MCC	Mission Control Center
MCC	Main Control Computer
MDC	Main Data Computer
MDP	Maximum Design Pressure
MDP	Maximum Dynamic Pressure
MET	Mission Elapsed Time
MHT	Main Helium Tank
MIT	Massachusetts Institute of Technology
MJ	Mega Joules
MLI	Multi-layer Insulation
MMOD	Micro-Meteoroid and Orbital Debris
MOSFET	Metal-Oxide-Silicon Field Effect Transistor
MV	Manually-actuated Valve
NaF	Sodium Fluoride
NASA	National Aeronautics and Space Administration
NBL	Neutral Buoyancy Laboratory

ACRONYMS AND ABBREVIATIONS

NbTi	Niobium Titanium
NSTS	National Space Transportation System
OD	Outside Diameter
OFHC	Oxygen Free High Conductivity
OHP	Oscillating Heat Pipe
OIU	Orbiter Interface Unit
P	Photon
p^+	proton
p^-	anti-proton
P&I	Process and Instrumentation
PAS	Payload Attach System
PCS	Portable Computer System
PDA	Payload Disconnect Assembly
PDIP	Payload Data Interface Panel
PDS	Power Distribution System
PEDS	Passive Electrical Disconnect System
PEEK	Polyetheretherketone
PFR	Portable Foot Restraint
PFTE	Teflon™
PGSC	Payload and General Support Computer
PGT	Pistol Grip Tool

ACRONYMS AND ABBREVIATIONS

PIP	Payload Integration Plan
PLB	Payload Bay
PMMA	Polymethyl Methacrylate (Plexiglas™)
PMT	Photo Multiplier Tube
PO	Payload Organization
POCC	Payload Operations Control Center
PPS	Passive Phase Separator
PRLA	Payload Retention Latch Assembly
PSE	Payload Safety Engineer
psi	Pounds per Square Inch
psia	Pounds per Square Inch, Absolute
psid	Pounds per Square Inch, Differential
PSRP	Payload Safety Review Panel
PVGF	Power Video Grapple Fixture
ρ	Density
RHV	RICH High Voltage
RICH	Ring Imaging Cerenkov Counter
RITF	Receiving Inspection Test Facility
ROEU	Remotely Operated Electrical Umbilical
RPCM	Remote Power Control Module
RWTH	Rheinisch-Westfälischen Technischen Hochschule (University of Technology)

ACRONYMS AND ABBREVIATIONS

μsec	microsecond
S3	Starboard 3 (Truss Designation)
SCL	Space Cryomagnetics Limited
SCL	Super Cooling Loop
SDP	Safety Data Package
SFHe	Superfluid Helium (He^{II})
SHV	TOF/ACC High Voltage
SiO_2	Silicon Dioxide
Si_3N_4	Silicon Nitride
SOC	State of Charge
SRMS	Shuttle Remote Manipulator System
SSP	Space Shuttle Program
SSP	Standard Switch Panel
SSPC	Solid State Power Controller
SSPF	Space Station Processing Facility
SSRMS	Space Station Remote Manipulator System
STA	Structural Test Article
STADCO	Standard Tool & Die Company
STD	Standard
STS	Space Transportation System
SVP	Structural Verification Plan

ACRONYMS AND ABBREVIATIONS

TAS	Tracker Alignment System
TBD	To Be Determined
TBR	To Be Resolved
TCS	Thermal Control System
Te	Tellurium
TeV	Tera Electron Volts
Ti	Titanium
Tm^2	Tesla-Meter Squared
TMP	Thermo-Mechanical Pump
TPG	Thermal Prolytic Graphite
TOF	Time Of Flight Counters
TRD	Transition Radiation Detector and associated Gas System
TTCB	Tracker Thermal Control Box
TTCE	Tracker Thermal Control Electronics
TTCS	Tracker Thermal Control System
UMA	Umbilical Mechanism Assembly
UPS	Uninterruptible Power Supply
USCM	Universal Slow Control Module
USS-02	Unique Support Structure-02
UTOF	Upper Time of Flight Counters
V	Volt or Volts

ACRONYMS AND ABBREVIATIONS

VC	Vacuum Case
VCL	Vapor Cooled Leads
VCS	Vapor Cooled Shields
VME	VERSAmodule Eurocard
W	Watt or Watts
WIF	Worksite Interface Fixture
WSA	Worksite Assessment
Xe	Xenon

APPLICABLE SAFETY DOCUMENTS

NSTS 1700.7B	Safety Policy and Requirements for Payloads Using the Space Transportation System
NSTS 1700.7B ISS Addendum	Safety Policy and Requirements for Payloads Using the International Space Station
NSTS/ISS 13830C	Payload Safety Review and Data Submittal Requirements for Payloads Using the Space Shuttle/International Space Station
NSTS/ISS 18798B	Interpretations of NSTS/ISS Payload Safety Requirements
JSC 26943	Guidelines for the Preparation of Payload Flight Safety Data Packages and Hazard Reports for Payloads Using the Space Shuttle