

Emergency Procedures

V211031.01

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Negative Orbit Insertion Abort

2A

1. Confirmation of Negative Orbit Insertion status with Mission Commander and Mission Director
2. Identify trajectory point for return
 - a. Before Negative Return:
 - 1) Perform **Return To Launch Site** (RTLS) abort
 - b. Post Negative Return:
 - 1) If TAL window open:
 - a. Perform **Transoceanic Abort Landing** (TAL)
 - 2) If TAL window closed:
 - b. Perform **Abort Once Around** (AOA)
3. Initiate abort procedures as indicated

Low Orbit Insertion Abort

2B

1. Confirmation of Abort To Orbit (ATO) status with Mission Commander and Mission Director
2. Evaluate orbital insertion status
 - a. Lower stable orbit possible:
 - As directed by Mission Control:
 - i. Reconfigure for possible additional OMS burn
 - or**
 - ii. continue operations
 - b. Lower stable orbit not possible:
 - Perform **AOA** as directed by Mission Control

In-Orbit Abort

2C

1. Confirmation of Abort status with Mission Commander and Mission Director
2. Initiate de-orbit burn procedures as directed by Mission Control

Return to Launch Site Abort

2D

1. Confirmation of Return to Launch Site Abort (RTLS) status with Mission Commander and Mission Director
2. Determine abort landing procedure options based on abort status:
 - a. KSC, East Coast Abort Landing location
 - b. Water landing
 - c. High altitude bailout

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APU Underspeed

- | | | | |
|-----|---|--------------|--------------|
| 1. | Mission Control confirms alarm and proceeds with <u>isolation of malfunctioning system.</u> | | |
| 2. | APU SPEED % | | |
| | a. 1 | <i>Check</i> | |
| | b. 2 | <i>Check</i> | |
| | c. 3 | <i>Check</i> | |
| 3. | APU SHUTDWN | ENABLE | |
| 4. | APU System Power Cycle | | |
| | a. APU MAIN POWER | OFF | |
| | b. APU MAIN POWER | ON | |
| 5. | APU CNTRL POWER | | |
| | a. 1 | OFF | |
| | b. 2 | OFF | |
| | c. 3 | OFF | |
| 6. | APU / HYDRAULICS | | |
| | a. 1 | OFF | |
| | b. 2 | OFF | |
| | c. 3 | OFF | |
| 7. | APU SPEED SELECT | | |
| | a. 1 | GPC | |
| | b. 2 | GPC | |
| | c. 3 | GPC | |
| 8. | APU SPEED % | | |
| | a. 1 | <i>Check</i> | |
| | b. 2 | <i>Check</i> | |
| | c. 3 | <i>Check</i> | |
| 9. | APU SPEED SELECT 1 | | HIGH |
| | APU SPEED % 1 | | <i>Check</i> |
| | APU SPEED SELECT 1 | | NORMAL |
| 10. | APU SPEED SELECT 2 | | HIGH |
| | APU SPEED % 2 | | <i>Check</i> |
| | APU SPEED SELECT 2 | | NORMAL |
| 11. | APU SPEED SELECT 3 | | HIGH |
| | APU SPEED % 3 | | <i>Check</i> |
| | APU SPEED SELECT 3 | | NORMAL |
| 12. | APU / HYDRAULICS | | |
| | a. 1 | | RUN |
| | b. 2 | | RUN |
| | c. 3 | | RUN |
| 13. | APU CNTRL POWER | | |
| | a. 1 | | ON |
| | b. 2 | | ON |
| | c. 3 | | ON |
| 14. | APU SHUTDWN | | INHIBIT |
| 15. | APU SPEED % | | |
| | a. 1 | | <i>Check</i> |
| | b. 2 | | <i>Check</i> |
| | c. 3 | | <i>Check</i> |
| 16. | <i>Re-assess system</i> | | |

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APU Overspeed

- | | | |
|-----|---|--|
| 1. | Mission Control confirms alarm and proceeds with <u>isolation of malfunctioning system.</u> | |
| 2. | APU SPEED %
a. 1
b. 2
c. 3 | <i>Check</i>
<i>Check</i>
<i>Check</i> |
| 3. | APU SHUTDWN | ENABLE |
| 4. | APU System Power Cycle
a. APU MAIN POWER
b. APU MAIN POWER | OFF
ON |
| 5. | APU CNTRL POWER
a. 1
b. 2
c. 3 | OFF
OFF
OFF |
| 6. | APU / HYDRAULICS
a. 1
b. 2
c. 3 | OFF
OFF
OFF |
| 7. | APU SPEED SELECT
a. 1
b. 2
c. 3 | GPC
GPC
GPC |
| 8. | APU SPEED %
a. 1
b. 2
c. 3 | <i>Check</i>
<i>Check</i>
<i>Check</i> |
| 9. | APU SPEED SELECT 1
APU SPEED % 1 | NORMAL
<i>Check</i> |
| 10. | APU SPEED SELECT 2
APU SPEED % 2 | NORMAL
<i>Check</i> |
| 11. | APU SPEED SELECT 3
APU SPEED % 3 | NORMAL
<i>Check</i> |
| 12. | APU / HYDRAULICS
a. 1
b. 2
c. 3 | RUN
RUN
RUN |
| 13. | APU CNTRL POWER
a. 1
b. 2
c. 3 | ON
ON
ON |
| 14. | APU SHUTDWN | INHIBIT |
| 15. | APU SPEED %
a. 1
b. 2
c. 3 | <i>Check</i>
<i>Check</i>
<i>Check</i> |
| 16. | <i>Re-assess system</i> | |

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APU Temperature

- | | | | |
|-----|--|--------------|--|
| 1. | Mission Control confirms alarm and proceeds with <u>isolation of malfunctioning system</u> | | |
| 2. | APU EGT | | |
| | a. 1 | <i>Check</i> | |
| | b. 2 | <i>Check</i> | |
| | c. 3 | <i>Check</i> | |
| 3. | APU SHUTDWN | ENABLE | |
| 4. | APU System Power Cycle | | |
| | a. APU MAIN POWER | OFF | |
| | b. APU MAIN POWER | ON | |
| 5. | APU CNTRL POWER | | |
| | a. 1 | OFF | |
| | b. 2 | OFF | |
| | c. 3 | OFF | |
| 6. | APU MSTR VLV | CLOSED | |
| 7. | APU FUEL TNK VLV | | |
| | a. 1 | CLOSE | |
| | b. 2 | CLOSE | |
| | c. 3 | CLOSE | |
| 8. | APU EGT | | |
| | a. 1 | <i>Check</i> | |
| | b. 2 | <i>Check</i> | |
| | c. 3 | <i>Check</i> | |
| 9. | APU FUEL TNK VLV | | |
| | a. 1 | OPEN | |
| | b. 2 | OPEN | |
| | c. 3 | OPEN | |
| 10. | APU MSTR VLV | OPEN | |
| 11. | APU CNTRL POWER | | |
| | a. 1 | ON | |
| | b. 2 | ON | |
| | c. 3 | ON | |
| 12. | APU SHUTDWN | INHIBIT | |
| 13. | APU EGT | | |
| | a. 1 | <i>Check</i> | |
| | b. 2 | <i>Check</i> | |
| | c. 3 | <i>Check</i> | |
| 14. | <i>Re-assess system</i> | | |

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Hydraulic Pressure

1. Mission Control confirms alarm and proceeds with isolation of malfunctioning system
2. HYD PRESSURE
 - a. 1 *Check*
 - b. 2 *Check*
 - c. 3 *Check*
3. HYD MAIN PUMP PRESSURE
 - a. 1 LOW
 - b. 2 LOW
 - c. 3 LOW
4. HYD CIRC PUMP
 - a. 1 OFF
 - b. 2 OFF
 - c. 3 OFF
5. APU / HYDRAULICS
 - a. 1 OFF
 - b. 2 OFF
 - c. 3 OFF
6. HYD PRESSURE
 - a. 1 *Check*
 - b. 2 *Check*
 - c. 3 *Check*
7. APU / HYDRAULICS
 - a. 1 RUN
 - b. 2 RUN
 - c. 3 RUN
8. HYD CIRC PUMP
 - a. 1 ON
 - b. 2 ON
 - c. 3 ON
9. HYD MAIN PUMP PRESSURE
 - a. 1 NORMAL
 - b. 2 NORMAL
 - c. 3 NORMAL
10. HYD PRESSURE
 - a. 1 *Check*
 - b. 2 *Check*
 - c. 3 *Check*
11. *Re-assess system*

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OMS Engine

AC Voltage

7A

1. Mission Control confirms alarm and proceeds with isolation of malfunctioning system
2. FLT CNTRL PWR ENABLE
3. ENGINE DAP MANUAL
4. N₂ CNTRL VLV LEFT
 - a. 1 CLOSE
 - b. 2 CLOSE
5. N₂ CNTRL VLV RIGHT
 - a. 1 CLOSE
 - b. 2 CLOSE
6. *Re-assess system*
7. N₂ CNTRL VLV LEFT
 - a. 1 OPEN
 - b. 2 OPEN
8. N₂ CNTRL VLV RIGHT
 - a. 1 OPEN
 - b. 2 OPEN
9. ENGINE DAP AUTO
10. FLT CNTRL PWR INHIBIT
11. *Re-assess system*

7B

1. Mission Control confirms alarm and proceeds with isolation of malfunctioning system
2. AC BUS SNSR MONITOR
3. AC BUS
 - a. 1 OFF
 - b. 2 OFF
 - c. 3 OFF
4. INVERTER
 - a. 1 OFF
 - b. 2 OFF
 - c. 3 OFF
5. *Re-assess system*
6. INVERTER
 - a. 1 ON
 - b. 2 ON
 - c. 3 ON
7. AC BUS
 - a. 1 ON
 - b. 2 ON
 - c. 3 ON
8. AC BUS SNSR AUTO
9. *Re-assess system*

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Forward RCS

8A

1. Mission Control confirms alarm and proceeds with isolation of malfunctioning system
2. FWD RCS He TANK ISOL
 - a. A CLOSE
 - b. B CLOSE
3. *Re-assess system*
4. FWD RCS He TANK ISOL
 - a. A OPEN
 - b. B OPEN
5. *Re-assess system*

Aft RCS

8B

1. Mission Control confirms alarm and proceeds with isolation of malfunctioning system
2. AFT RCS LEFT He TANK ISOL
 - a. A CLOSE
 - b. B CLOSE
3. AFT RCS RIGHT He TANK ISOL
 - a. A CLOSE
 - b. B CLOSE
4. *Re-assess system*
5. AFT RCS LEFT He TANK ISOL
 - a. A OPEN
 - b. B OPEN
6. AFT RCS RIGHT He TANK ISOL
 - a. A OPEN
 - b. B OPEN
7. *Re-assess system*

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Main Engine

9A

1. Mission Control confirms alarm and proceeds with isolation of malfunctioning system
2. Identify Main Engine Operational Status
 - a. Left engine Confirm
 - b. Center Engine Confirm
 - c. Right Engine Confirm
3. Perform Manual Shutdown of Main Engine Power for Non-operating Engine identified in step 2
 - a. Main Engine Power
 - i. LEFT OFF
 - ii. CENTER OFF
 - iii. RIGHT OFF
4. Perform Manual Initialization of Main Engine Power for Non-operating Engine identified in step 2
 - a. Main Engine Power
 - i. LEFT ENABLE
 - ii. CENTER ENABLE
 - iii. RIGHT ENABLE
5. *Re-assess system*
6. Evaluate Statue of Orbital Insertion
 - a. Nominal Mission Go
 - b. Off-Nominal Go to AOA/ATO Abort checklist

Solid Rocket Booster

9B

1. Mission Control confirms alarm
2. Identify SRB Operational Status
 - a. Left SRB *Confirm*
 - b. Right SRB *Confirm*
3. Evaluate Status of Orbital Insertion
 - a. Nominal Mission Go
 - b. Off-Nominal Mission Abort
4. Mission Go status
 - a. Monitor SRB operational status until SRB SEP
5. Mission Abort status
 - a. Perform Emergency SRB Jettison
 - b. Execute RTL Abort checklist

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Malfunction during Payload Bay Door **OPEN** Procedure

Mission Control confirms alarm during Payload Bay Open Procedure

A. If alarm is on Payload Bay Door

1. PAYLOAD BAY DOOR CLOSE
2. PAYLOAD BAY POWER OFF
3. PAYLOAD BAY POWER ON
4. PAYLOAD BAY DOOR OPEN

5. *Re-assess system*

B. If alarm is on Radiators

1. RADIATORS STOW
2. PAYLOAD BAY POWER OFF
3. PAYLOAD BAY POWER ON
4. RADIATORS DEPLOY

5. *Re-assess system*

C. If alarm is on Ku Band Antenna

1. Ku ANTENNA STOW
2. PAYLOAD BAY POWER OFF
3. PAYLOAD BAY POWER ON
4. Ku ANTENNA DEPLOY

5. *Re-assess system*

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Malfunction during Payload Bay Door **CLOSE** Procedure

Mission Control confirms alarm during Payload Bay **Close** Procedure

A. If alarm is on Payload Bay Door

1. PAYLOAD BAY DOOR OPEN
2. PAYLOAD BAY POWER OFF
3. PAYLOAD BAY POWER ON
4. PAYLOAD BAY DOOR CLOSE
5. *Re-assess system*

B. If alarm is on Radiators

1. RADIATORS DEPLOY
2. PAYLOAD BAY POWER OFF
3. PAYLOAD BAY POWER ON
4. RADIATORS STOW
5. *Re-assess system*

C. If alarm is on Ku Band Antenna

1. Ku ANTENNA DEPLOY
2. PAYLOAD BAY POWER OFF
3. PAYLOAD BAY POWER ON
4. Ku ANTENNA STOW
5. Re-assess system

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Smoke or Fire in Cabin

12A

1. Mission Control confirms alarm and determines location
2. Visual inspection for smoke or fire *Confirm*
3. CABIN TEMP *Check*
4. O2 SYS *CLOSE*
5. CABIN FIRE SUPPRESSION
 - a. FLIGHT DECK *ACTIVATE*
 - b. MID DECK *ACTIVATE*
 - c. LOWER DECK *ACTIVATE*
6. CABIN TEMP *Check*
7. CABIN FIRE SUPPRESSION
 - a. FLIGHT DECK *SAFE*
 - b. MID DECK *SAFE*
 - c. LOWER DECK *SAFE*
8. O2 SYS *OPEN*
9. *Land as soon as practical*

Smoke or Fire in AV Bay

12B

1. Mission Control confirms alarm and determines location
2. AV BAY
 - a. TEMP 1 *Check*
 - b. TEMP 2 *Check*
 - c. TEMP 3 *Check*
3. AV BAY FIRE SUPPRESSION
 - a. AV BAY 1 *ACTIVATE*
 - b. AV BAY 2 *ACTIVATE*
 - c. AV BAY 3 *ACTIVATE*
4. AV BAY
 - a. TEMP 1 *Check*
 - b. TEMP 2 *Check*
 - c. TEMP 3 *Check*
5. AV BAY FIRE SUPPRESSION
 - a. AV BAY 1 *SAFE*
 - b. AV BAY 2 *SAFE*
 - c. AV BAY 3 *SAFE*
6. *Land as soon as practical*

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Smoke or Fire in Payload Bay

13A

1. Mission Control confirms alarm and determines location
2. PAYLOAD BAY
 - a. FWD TEMP *Check*
 - b. AFT TEMP *Check*
3. PAYLOAD BAY FIRE SUPPRESSION
 - a. FWD **ACTIVATE**
 - b. AFT **ACTIVATE**
4. PAYLOAD BAY
 - a. FWD TEMP *Check*
 - b. AFT TEMP *Check*
5. PAYLOAD BAY FIRE SUPPRESSION
 - a. FWD **SAFE**
 - b. AFT **SAFE**
6. *Land as soon as practical*

Smoke or Fire in Space Lab

13B

1. Mission Control confirms alarm and determines location
2. SPACE LAB
 - a. FWD TEMP *Check*
 - b. AFT TEMP *Check*
3. SPACE LAB FIRE SUPPRESSION
 - a. FWD **ACTIVATE**
 - b. AFT **ACTIVATE**
4. SPACE LAB
 - a. FWD TEMP *Check*
 - b. AFT TEMP *Check*
5. SPACE LAB FIRE SUPPRESSION
 - a. FWD **SAFE**
 - b. AFT **SAFE**
6. *Land as soon as practical*

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