STS-98

*2816815 *

DEC 20 '00

PROCESSING OPERATIONS CONTROL
OMI PLANNING SHEET

SPC 764

Wad Number	SITE	Elem CD	End Item	
S6444-I-R01	PAD-A FR	V	104 FLT: 023	DATE: 12/12/2000 TIME: 08:20:03

Title: SSV ICE AND DEBRIS ASSESSMENT

Sub Element/Zone: 30

Project Work Order No.	Hazard:	SFOC Safety	
	☒ Yes ☐ No	N/A TOTAL BOOK	WC 126 USA

☐ Local Copy
☒ Firing Room Copy

Authorizing Document	Material & Equipment:	MICR Req'd	OMRS:
ORB423	☒ Yes ☐ No	☐ Yes ☒ No	☒ Yes ☐ No

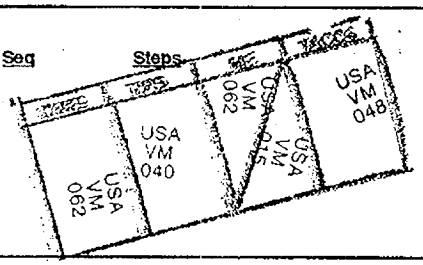
MAY 15 '01

SPC 382

PERFORM THE FOLLOWING:

Pre-Ops Setups

Task	Operation Number	Seq	Steps	Task	Operation Number	Seq	Steps
	S/L 1(ALL)						



OPS Support

Task	Operation Number	Seq	Steps	Task	Operation Number	Seq	Steps
	1-4(ALL)						

Operating Instructions

Task	Seq	Steps	Task	Seq	Steps
	04(ALL)				

USA VM 047

Post Ops

Task	Operation Number	Seq	Steps
	1-6(ALL)		

USA VM 070

Appendices

Task	Seq
	A-H,K,L(ALL)
	Z N/A

Subtask WAD's

N/A

Planner		Ext	QC Closure	Date	Page
LISA RUTKOWSKI	WC 126 USA	0746	SPC 282	MAY 15 '01	1 OF 1

USA 32-82 Rev 03-99 (Flow)

OMI TASK CLOSEOUT CHECKLIST

OMI No.	Run No.	Task Control No. (TCN)
S6444 I	1	2816815-F/R
Start Date	**Completion Date**	**Closure Date**
2/6/01	5/10/01	MAY 15 '01 5/14/01

		QC/Eng.	Date
1.	Deviation Index: Verify total number of deviations agree with index. Verify entry is correct into OMI.	ET 01	5/14/01
2.	Constraints List: Verify all constraints are accepted by QC or waivered by Engineering. Verify that constraints list is complete and closed. SUBTASKED TO S0007 R. Seale ETm 5/14/01	N/A	5/14/01
3.	IPR's: Verify that all IPR's are closed or upgraded to problem reports or dispositioned as no constraint to OMI closure and incorporated in central IPR system and a copy of the central IPR sort attached.	IPR PRR N/A	MAY 15 '01
4.	Verify that material and equipment requirement list enclosed (if applicable).	ET 01	5/14/01
5.	OMI: Verify that all pages or verification sheets are completed, stamped, and dated in the lower left/right hand corners.	ET 01	5/14/01
6.	OMI: Verify that all miscellaneous documents/procedures have sequence number referenced and stamped; e.g., photos, sample results, etc.	ET 01	5/14/01
7.	Planned task/OMI satisfactorily completed. OPR: R. Seale ETm 5/14/01	ET 01	ET 01 5/14/01
8.	LSS review prior to closure for CIL OMI's. MMC N/A Thiokol N/A		

DATE: 04-22-00

OMI NO. - S6444
REV. - I

****
*
* SSV ICE AND DEBRIS ASSESSMENT *
*
****
* EFFECTIVITY CATEGORY: B *
* HB-STVBAD *
* CENTER: KSC *
* SYSTEM: ETM *
* SITE: LC 39 *
* *
* VEHICLE: ALL *
* *
* FLOW: ET-70 & SUBS *
* *
* DESIGN CENTER CONCURRENCE: MSFC/JSC *
****

THIS DOCUMENT CONTAINS HAZARDOUS OPERATIONS

National Aeronautics and Space Administration

Kennedy Space Center

SPACE SHUTTLE

DATE: 04-22-00

OMI NO. - S6444
REV. - I

REVISION RECORD PAGE

REV-CHANGE	DATE	REASON	PAGES AFFECTED	EFFECTIVITY
D	12-14-94	09/LSO206 RCN'S MS10834M MS12180M SS QPRD	ALL	ET-65&SUBS
E	05-11-95	10/LSO437	ALL	ET-70&SUBS
F	02-08-96	11/LSO437	ALL	ET-70&SUBS
G	03-30-98	12/USK437 RCN SS12779	ALL	ET-65&SUBS
H	05-05-99	13/USK437	ALL	ET-100&SUBS
I	04-22-00	14/USK206	ALL	ET-103&SUBS

OMI NO. - S6444
DATE: 04-22-00 REV. - I

REVISION RECORD PAGE

REV-CHANGE	DATE	REASON	PAGES AFFECTED	EFFECTIVITY
D	12-14-94	09/LSO206 RCN'S MS10834M MS12180M SS QPRD	ALL	ET-65&SUBS
E	05-11-95	10/LSO437	ALL	ET-70&SUBS
F	02-08-96	11/LSO437	ALL	ET-70&SUBS
G	03-30-98	12/USK437 RCN SS12779	ALL	ET-65&SUBS
H	05-05-99	13/USK437	ALL	ET-100&SUBS
I	04-22-00	14/USK206	ALL	ET-103&SUBS

TABLE OF CONTENTS

SECTION V - POST OPERATION INSTRUCTIONS

APPENDICES

DATE: 04-22-00

OMI NO. - S6444
REV. - I

OBJECTIVE

PROVIDE NECESSARY TASKS THAT DOCUMENT, MONITOR AND EVALUATE ICE AND DEBRIS CONDITIONS TO ELIMINATE OR MINIMIZE DEBRIS CONCERNS OF THE INTEGRATED SSV DURING ET TANKING, FRF AND LAUNCH.

DESCRIPTION

1. THIS OMI IS PERFORMED AS SUBTASK TO S0007/S0014/S0037.

2. THIS OMI PROVIDES DOCUMENTATION OF ICE/DEBRIS ACTIVITIES:

   A. PRE-LAUNCH WEATHER BRIEFING

   B. PRE-LAUNCH DEBRIS INSPECTION

   C. COUNTDOWN - BASED TIMELINE EVALUATION MONITORING OF ET TPS SURFACES USING OTV

   D. OTV MONITORING OF SEAL/FLANGE AREAS FOR CRYOGENIC LEAKAGE

   E. SSV OTV MONITORING FOR DEBRIS CONDITIONS DURING COUNTDOWN

   F. CRYOGENIC REPLENISH INSPECTION FOR EVALUATION OF SSV AND FACILITY DEBRIS CONCERNS OR ANOMALIES

   G. EVALUATION OF CONCERNS/ANOMALIES IN THE EVENT OF ET DETANKING

   H. REVIEW OF ENGINEERING FILM DATA FOR LAUNCH OR SSME IGNITION

3. ORBITER LANDING DEBRIS INFORMATION IS CONTAINED IN THE NASA PUBLICATION FOR ICE, FROST, DEBRIS ASSESSMENT. THAT REPORT IS REFERENCED IN THIS OMI FOR CONTINUITY OF DEBRIS DATA.

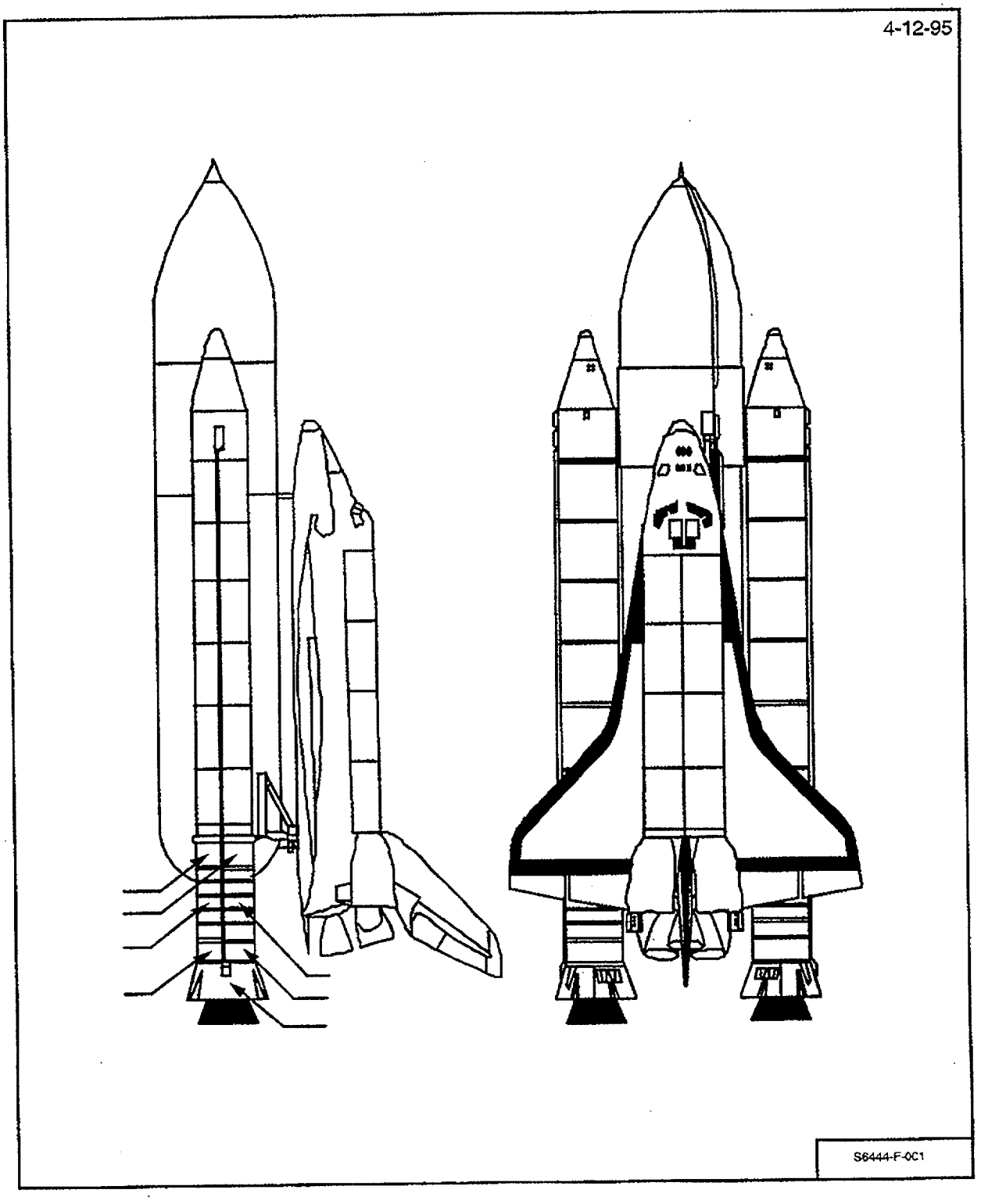


FIGURE 1 - 95 FT LEVEL OVERALL VIEW
(FOR REFERENCE ONLY)

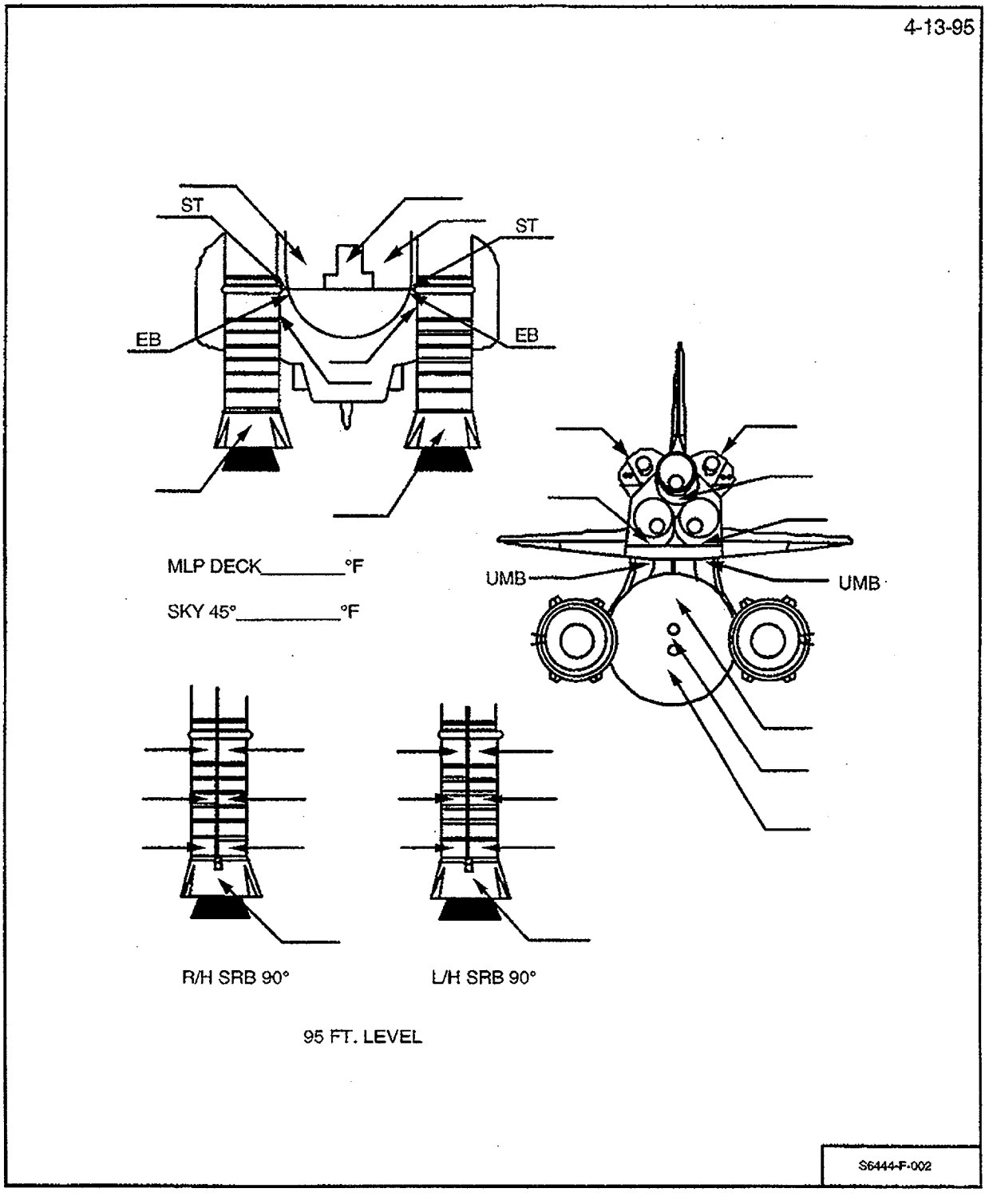


FIGURE 2 - 95 FT LEVEL
(FOR REFERENCE ONLY)

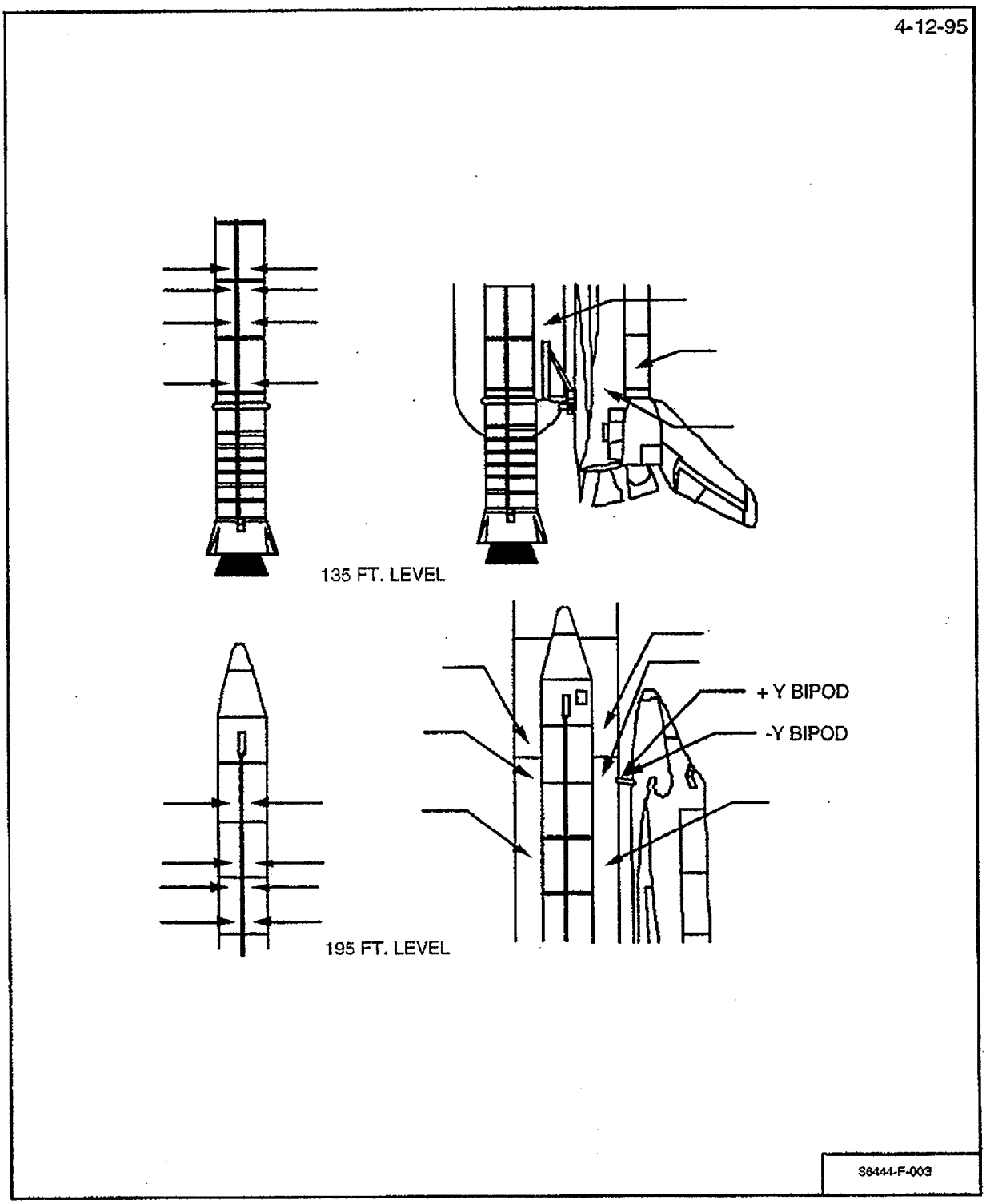


FIGURE 3 - 135 FT/95 FT LEVEL
(FOR REFERENCE ONLY)

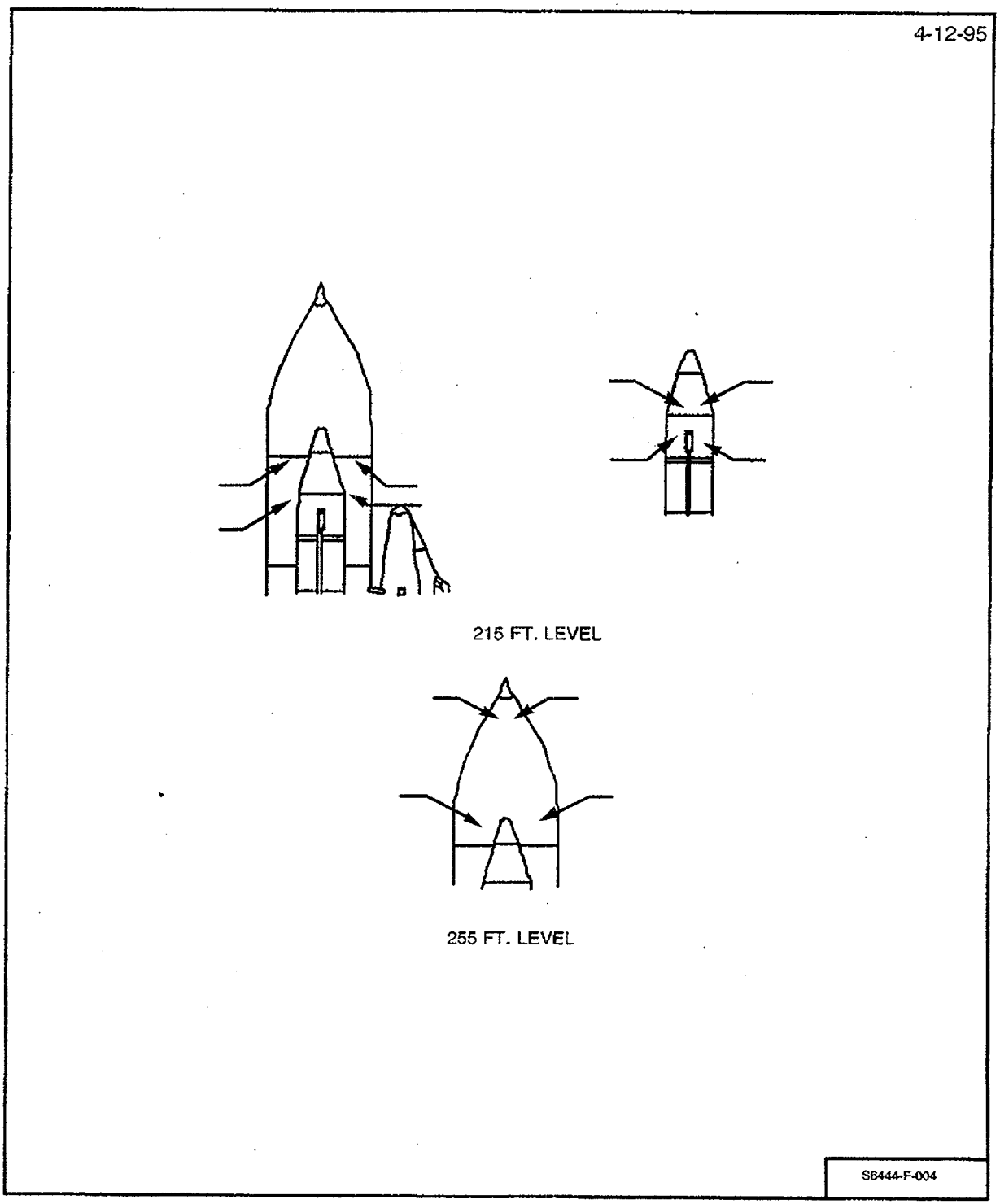
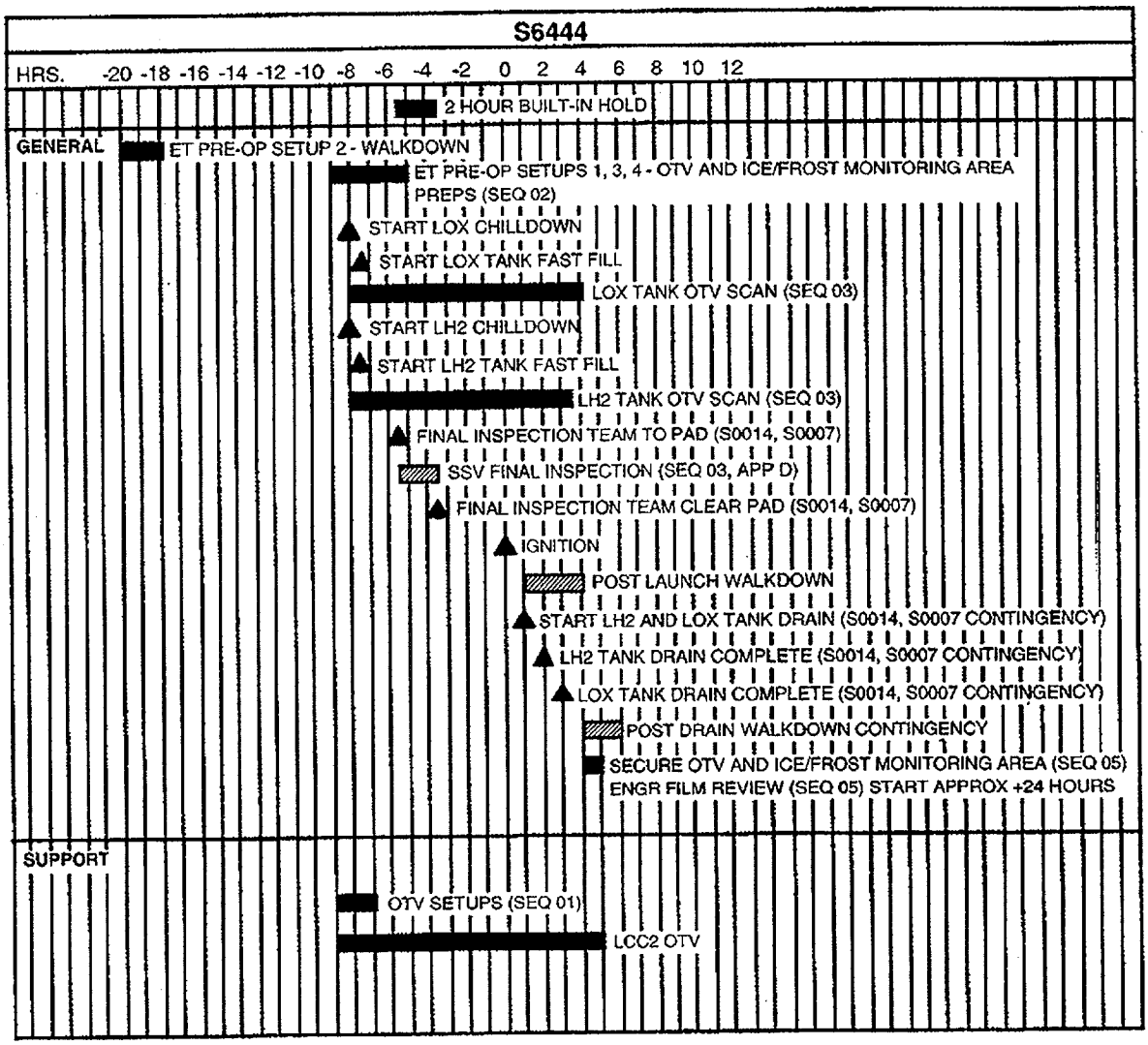


FIGURE 4 - 215 FT/255 FT LEVEL
(FOR REFERENCE ONLY)

2-7-96



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SECTION I

INFORMATION

1.1 REFERENCED INSTRUCTIONS

1.1.1 DOCUMENTS

NUMBER	REV	TITLE
GSOP 5400	LI	GROUND SAFETY OPERATING PROCEDURES
KHB 1710.2	LI	KSC SAFETY PRACTICES HANDBOOK (KSC)
NSTS 08303	LI	NSTS PROGRAM ICE/DEBRIS INSPECTION CRITERIA
NSTS 16007	LI	NSTS PROGRAM LAUNCH COMMIT CRITERIA - HAZARDOUS GAS SUBSYSTEM AND APPENDIX F
QPRD 001	LI	QUALITY PLANNING REQUIREMENTS DOCUMENT

1.1.2 DRAWINGS

NUMBER	REV	TITLE
80901019010	LI	ET POST BUILD ACCEPTANCE AND IN-PROCESS REWORK REQUIREMENTS MANUAL - OFFSITE

1.1.4 SUPPORTING SOFTWARE

APPL PGM	TITLE
	SURFICE REV C

1.2 COMPUTER SYSTEMS

PC GOAL
CCMS
CDS
CMS

1.3 SPECIAL TOOLS, EQUIPMENT AND MATERIALS

1.3.2 EQUIPMENT

ISSUE/ RETURN	PART NO.	NOMENCLATURE	AVAIL	MAX KIT	QTY	FUNCTION
___/___	NA	BINOCULARS, 7X35 OR GREATER (UI=EACH)	ET 01 2/6/01	2	1	POSU-ALL
					1	OI-ALL
					1	POI-ALL
___/___	NSL	COVERALLS, BLUE COLLAR, FLAME RETARDANT (UI=EACH)	ET 01	1	1	OI-08
					1	OI-09
___/___	MINOLTA OR RAYTECK	HAND-HELD INFRARED THERMOMETER (UI=EACH)	ET 01	1	1	POSU-ALL
					1	OI-ALL
					1	POI-ALL
___/___	NA	35MM SLR CAMERA, LENS AND ACCESSORIES (UI=EACH)	ET 01	1	1	OI-ALL
					1	POI-ALL
___/___	NA	DUPLEX QUESTAR 3-1/2 IN. TELESCOPE W/VARIOUS ATTACHMENTS AND TRIPOD (UI=EACH)	ET 01	1	1	POSU-ALL
					1	OI-ALL
					1	POI-ALL
___/___	NA	ICICLE RETRIEVAL NET (UI=EACH)	ET 01	1	1	POSU-ALL
___/___	NAS-260	SYNTOX METER (UI=EACH)	ET 01	1	1	OI-ALL
___/___	NA	COVERALLS, NOMEX WITH GLOVES/HOOD (UI=EACH)	ET 01 2/6/01	1	1	OI-04

DATE: 04-22-00

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___/___	NA	HARNESS (UI=EACH)	ET 01 2/6/01	1	1	OI-04
				1	1	OI-08
				1	1	OI-09
___/___	NA	LANYARD, 6 FT (UI=EACH)	ET 01	1	1	OI-04
				1	1	OI-08
				1	1	OI-09
___/___	NA	LANYARD, 11 FT (UI=EACH)	ET 01	1	1	OI-04
				1	1	OI-08
				1	1	OI-09
___/___	STI	PORTABLE IR UNIT (UI=EACH)	ET 01	1	1	OI-04
___/___	BOSCH	SPOTTING SCOPE (UI=EACH)	ET 01	1	1	OI-04
___/___	NA	WIRE CHOKERS (UI=EACH)	ET 01	2	2	OI-04
___/___	NA	HEADSETS (UI=EACH)	ET 01	2	2	OI-04
___/___	NA	SONY DKC-ID1 DIGITAL CAMERA (UI=EACH)	ET 01	1	1	POSU-ALL
					1	OI-ALL
___/___	NA	KODAK DL50/120 DIGITAL CAMERA (UI=EACH)	ET 01	1	1	POSU-ALL
					1	OI-ALL
___/___	NA	DIGITAL HIGH RESOLUTION SLR (UI=EACH)	ET 01	1	1	POSU-ALL
					1	OI-ALL
___/___	NA	SONY MVC-FD91 DIGITAL CAMERA (UI=EACH)	ET 01 2/6/01	1	1	OI-ALL

ET 01

1.4 SUPPORT TOOLS, EQUIPMENT AND MATERIALS

1.4.2 COMMUNICATIONS (PER CONTROLLING OMI S0007, S0014 OR S0037)

1.4.3 OTV (PER CONTROLLING OMI S0007, S0014, S0037)

1.4.4 COUNTDOWN DISPLAY/STATUS

DISPLAY REQUIRED	BLDG	ROOM	OPERATION TIME
TIMING	LCC	FR2	DURATION OF TEST
COUNTDOWN AND GMT	LCC	FR2	DURATION OF TEST

1.4.8 SERVICES

SERVICE/SPECIAL REQUIREMENTS	LOCATION	PURPOSE
SFOC SAFETY	LC-39 A&B	SAFETY SUPPORT
ELSA'S (8)	LC-39 A&B	INSPECTION TEAM USE
RADIO NET 105	LC-39 A&B	INSPECTION TEAM USE

1.4.12 PROPELLANTS, GASES AND CHEMICALS

COMMODITY	SPEC NO.	QUAN	RCVR	LOCATION	MIN. PRESS	DELV TIME
GN2	SES-0073 -6.3-5	MIN 750 CU FT	PK-H 861-3645	PAD 39B CAMERA SITE 2	3000 PSI	1 WEEK PRIOR T-0

1.6 SAFETY REQUIREMENTS

1.6.1 HAZARDS

WORKING AT UNPROTECTED HEIGHTS.

1.6.2 REQUIREMENTS

1. IF LIGHTNING ACTIVITY IS FORECAST TO BE WITHIN 5 MILES OF LAUNCH PAD, NTD AND SFOC SAFETY SHALL IMPLEMENT PROVISIONS OF ADVERSE/SEVERE WEATHER AND LIGHTNING POLICY CONTAINED IN GSOP 5400 GROUND SAFETY OPERATIONS PROCEDURES.

2. THERE ARE NO SAFING/SHUTDOWN OR EVACUATION STEPS REQUIRED IN THIS OMI.

3. HAZARDOUS OPERATIONS WITHIN THIS SUBTASK OMI WILL NOT BE STARTED UNTIL SAFETY CONCURRENCE TO PROCEED HAS BEEN GIVEN PER THE INTEGRATED OMI CONTROLLING THIS SUBTASK.

1.7 SPECIAL INSTRUCTIONS

1. THIS OMI IS RUN AS A SUBTASK TO OMI'S S0007, S0014, AND S0037. ALL PAD CLEARING AND CONTROLLED ACCESS OPERATIONS WILL BE PERFORMED PER THOSE OMI'S.

2. NO OPEN ITEM REVIEW (OIR) IS REQUIRED FOR THIS OMI. CONSTRAINTS WILL BE STATUSED BY CONTROLLING OMI'S S0007/S0014/S0037.

3. THE OTV CAMERA NUMBERING SCHEME FOR PAD A/B IS 0XX/1XX.

4. TASK TEAM LEADER ASSIGNMENT:

   OI-02 - CICE
   OI-03 - CICE
   OI-04 - CTIF
   OI-05 - PK-H
   OI-06 - CICE
   OI-07 - PK-H
   OI-08 - PK-H

5. FROM TIME STABLE REPLENISH MODE STARTS UNTIL START OF FINAL SCAN, SCANNING WITH INDIVIDUAL CAMERAS SHOULD BE PERFORMED APPROXIMATELY ONCE PER HOUR..

6. CAMERAS 061/161, 063/163, AND 070/170 MAY BE RELEASED TO NASA SELECT WITH CICE CONCURRENCE.

7. ALL PERSONNEL PARTICIPATING IN FINAL INSPECTION AND POST DRAIN WALKDOWN SHALL BE CURRENT IN FOLLOWING TRAINING:

   A. EMERGENCY PAD EGRESS

   B. FIRE FIGHTING

   C. ELSA

8. MILESTONES:

   A. MLP PORTION OF POST LAUNCH WALKDOWN COMMENCES AT APPROXIMATELY T+1 HOURS.

   B. PAD ACREAGE PORTION OF THE POST LAUNCH WALKDOWN COMMENCES AT APPROXIMATELY T+2 HOURS. (MAY BE DEFERRED UNTIL PREFERRED DAYLIGHT HOURS.)

   C. POST DRAIN WALKDOWN COMMENCES AT APPROXIMATELY T+3 HOURS AFTER DRAIN INITIATED (TYPICALLY 1 1/2 HOURS AFTER LH2/LO2 LOW LEVEL SENSORS DRY).

9. HANDS-ON INVESTIGATION REQUIRED FOR ALL ET-TPS DEFECTS SUSPECTED OF VIOLATING NSTS 08303 ICE/DEBRIS INSPECTION CRITERIA.

10. FROM TIME LAUNCH SCRUB IS DECLARED UNTIL 1.5 HOURS PAST TIME LH2/LO2 LOW LEVEL SENSORS READ DRY, OTV CAMERA SCANNING SHALL BE PERFORMED APPROXIMATELY ONCE PER HOUR.

11. OTV CAMERAS 004/104, 009/109, 013/113, 033/133, 042/142, 054/154, 055/155, 056/156, 060/160, 061/161, 062/162, 063/163, 064/164, 065/165, 066/166, 067/167, 070/170, AND 071/171 SHALL BE USED TO MONITOR LO2/LH2 TANK DRAIN OPERATIONS.

12. EXCESSIVE VAPORS ARE DEFINED AS BEING MORE SEVERE THAN THAT DESCRIBED IN NSTS 08303 - ICE/DEBRIS INSPECTION CRITERIA OR NSTS 16007 - LAUNCH COMMIT CRITERIA - HAZARDOUS GAS SUBSYSTEM.

13. QUALITY COVERAGE IS NOT REQUIRED FOR PERFORMANCE OF THIS OMI. REF SFOC-GO0007, ICE AND DEBRIS TEAM OPERATIONS ARE EXEMPT FROM QUALITY COVERAGE. THE ROR (CTIF) PERFORMS THE CMQC FUNCTION FOR ALL NON-HAZARDOUS SEQUENCES.

14. PERSONNEL USING SONY DKC-ID1 CAMERA SHALL VERIFY LITHIUM ION BATTERY IS SECURELY LOCKED IN THE BAYONETTE FITTING AND THE LITHIUM BUTTON BATTERY DOOR IS SECURELY LOCKED AND TAPED IN PLACE.

15. VERIFY CAMERA FLASH IS DEACTIVATED.

16. PERSONNEL USING KODAK DC 50/120 CAMERA SHALL VERIFY ALKALINE BATTERIES ARE PROPERLY INSTALLED.

17. PERSONNEL USING DIGITAL CAMERAS SHALL NOT OPERATE IN H2 LEAK OR O2 RICH ENVIRONMENT (23 PERCENT OR GREATER).

18. PERSONNEL USING THE SONY MVC-FD91 CAMERA SHALL VERIFY THE LITHIUM ION BATTERY IS SECURELY LOCKED AND THE BATTERY DOOR IS LOCKED CLOSED. PERSONNEL SHALL VERIFY THAT BOTH BATTERY DOORS (LITHIUM ION AND LITHIUM BUTTON) ARE CLOSED AND TAPED SHUT.

19. PERSONNEL SHALL VERIFY THAT CAMERAS AND EQUIPMENT ARE SECURELY TETHERED WHEN AT THE PAD WHILE THE SSV IS PRESENT.

DATE: 04-22-00

1.8 OMRS REQUIREMENTS SATISFIED BY THIS TOP

VEHICLE/ELEMENT NO. ORB_____/FLT_____ ET_____ SRB_____ LH___ RH___

GROUND HARDWARE PMN/SN _____ COMPONENT/SEGMENT _____/FLT_____

SITE _____ TCN _____ DATE _____

TOP WAS RUN AS A STANDALONE YES _____ NO _____
TOP WAS RUN AS A SUBTASK TO TOP _____.

OMRS NO./CIL NO	NOMENCLATURE/ EFFECTIVITY	SEQ-STEP (CAP)	QC/ENG VERIF
S00E00.021	ET TPS MON DURING DETANK TAF;C	03-040	
S00E00.031	POST DETANK ET TPS INSPECT TAF;C	05-013	
S00FA0.600 (1)	RSRM PMBT B025,027-999;C	02-003	
S00FA0.900	PRELAUNCH WEATHER BRIEFING (L-1 DAY) VAF1-90	02-002	
S00FB0.005 (1)	ET TPS SURFACE MONITORING T23,27-29,31-999	03-013 03-027	
S00FB0.350 (1)	MONITOR GO2 VENT HOOD VAF1-90	04-024	
S00FB0.360 (1)	MONITOR ET/ORB MPS FOR LEAKAGE VAF1-90	03-027	
S00L00.150 (1)	HIGH WIND ET NOSE INSPECTION (KSC) SAF;C	03-013 04-021	
S00U00.010 (1)	POST LAUNCH SHUTTLE/PAD AREA INSPECTION SAF1-999	05-018	
S00U00.011 (1)	ENGR REVIEW & ANALYSIS OF LAUNCH FILM SAF1-999	05-026	

DATE: 04-22-00

OMI NO. - S6444
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1.8 OMRS REQUIREMENTS SATISFIED BY THIS TOP

VEHICLE/ELEMENT NO. ORB_____/FLT_____ ET_____ SRB_____ LH___ RH___

GROUND HARDWARE PMN/SN _____ COMPONENT/SEGMENT _____/FLT_____

SITE _____ TCN _____ DATE _____

TOP WAS RUN AS A STANDALONE YES _____ NO _____
TOP WAS RUN AS A SUBTASK TO TOP _____.

OMRS NO./CIL NO	NOMENCLATURE/ EFFECTIVITY	SEQ-STEP (CAP)	QC/ENG VERIF
S00U00.020-A (1)	AN ENGINEERING PAD INSPECTION TEAM SAF1-999	03-031	_____
S00U00.020-C (1)	INSPECT ORBITER AFT ENGINE SAF1-999	03-031	_____
S00U00.020-D (1)	INFRARED SURVEILLANCE SAF1-999	03-031	_____
S00U00.030 (1)	PRELAUNCH SHUTTLE/PAD AREA INSPECTION SAF1-999	02-006	_____

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SECTION II

PRE-OPERATION SETUP INSTRUCTIONS

SEQ	CMD	RESP	DESCRIPTION	VERIF.
01-000			PRE-OPERATION SETUPS - SUPPORT	
01-001			PRE-OPERATION SETUP 1 - SUPPORT PREPARATIONS	
01-002	STM 138	JYVO	VERIFY PAD OTV SYSTEM IS CONFIGURED TO SUPPORT S6444 AS SCHEDULED.	COMM
01-003	STM 111 JSTC 114	JSTC *SCB	VERIFY EIGHT 10-MINUTE ELSA'S AVAILABLE AT COMPLEX J FOR USE BY FINAL INSPECTION TEAM (REF S0007/S0014/S0037).	LS
01-004	STM 136	TBC	SUPPORT PRE-OPERATION SETUP 1 - SUPPORT PREPARATIONS COMPLETE.	

ET 01
2/6/01
19

PRE-OPERATION SETUP INSTRUCTIONS

SEQ	CMD	RESP	DESCRIPTION	VERIF.

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DATE: 04-22-00

OMI NO. - S6444
REV. - I

PRE-OPERATION SETUP INSTRUCTIONS

SEQ	CMD	RESP	DESCRIPTION	VERIF.
02-000			PRE-OPERATION SETUPS - ET	
02-001			PRE-OPERATION SETUP 1 - ICE PREDICTION BRIEFING	
02-002	CICE		CONDUCT L-1 DAY ICE PREDICTION BRIEFING WITH LAUNCH DIRECTOR. PK-H SIGNATURE Robert F. Speer 02-07-01 OMRSD S00FA0.900 USA VM 070	
			NOTE PERFORM NEXT STEP FOR LAUNCH COUNTDOWN ONLY.	
02-003			VERIFY PREDICTED RSRM L-1 PROPELLANT MEAN BULK TEMPERATURE (PMBT) (PROVIDED BY THE RSRM CONTRACTOR) AT TIME OF LAUNCH IS 44-86 DEGREES F. RECORD PMBT (DEG F). RSRM PMBT 61 DEGREES F OMRSD S00FA0.600-1 USA VM 070 ETM R Brewer DATE 02-7-01 NOT PERFORMED N/A	
02-004			ET PRE-OPERATION SETUP 1 - ICE PREDICTION BRIEFING COMPLETE.	

2-7-01 ET 05

PRE-OPERATION SETUP INSTRUCTIONS

SEQ	CMD	RESP	DESCRIPTION	VERIF.

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STEP 02-003

Thiokol Propulsion
an Alcoa business

PO Box 707, M/S E00
Brigham City, UT 84302-0707 USA
Tel: 1 435 863 3954
Fax: 1 435 863 8755
george.alford@thiokol.com

George C Alford
Vice President and
RSRM Program Manager

February 6, 2001
E600-CY01-063

George C. Marshall Space Flight Center
National Aeronautics & Space Administration
Marshall Space Flight Center, AL 35812

Attention Mr. M. U. Rudolphi, MP51

Gentlemen:

Subject: RSRM-77/STS-98 Transmittal of L-24 Hour PMBT Prediction

This letter officially transmits the L-24 hour propellant mean bulk temperature (PMBT) predicted for STS-98, scheduled for launch on February 7, 2001. The PMBT at the time of launch is predicted to be 61°F., which is within the 44° to 86°F requirement. This PMBT prediction is also valid for Thursday February 8, 2001.

Very truly yours,

G. C. Alford

GCA:DPN/mp

cc: G. Alford, E00
T. Boardman, L00
J. Burn, LD0
S. Eden, E68
J. Endicott, E68
K. Foulger/D. Nisonger, E62
A. Neilson, LG1
D. Ruddel, E68
R. Roth, Thiokol/MSFC
T. Shaffner, Thiokol/KSC
G. Smith, A10
B. St Aubin, Thiokol/KSC
D. Blackwell/D. Woods, MP51
D. Burton, K68
S. Cash, MP51
P. Teehan, KSC-SK

Plus FAX list

ET 01

2/7/01

PRE-OPERATION SETUP INSTRUCTIONS

SEQ	CMD	RESP	DESCRIPTION	VERIF.
02-005			PRE-OPERATION SETUP 2 - PRE-LAUNCH WALKDOWN	

WARNING

PERSONNEL WORKING AT HEIGHTS GREATER THAN 4 FT AND WITHIN 6 FT OF AN UNGUARDED EDGE WILL WEAR A SAFETY HARNESS WITH THE LANYARD SECURED TO AN APPROVED TIE OFF POINT, SUBSTANTIAL STRUCTURAL MEMBER (NO HANDRAILS) OR A PROPERLY INSTALLED LIFELINE.

NOTE

THIS PRE-OPERATION SETUP IS PERFORMED AT APPROXIMATELY L-20 HOURS. WHEN THIS PRE-OPERATION SETUP IS PERFORMED IN SUPPORT OF A 24 HOUR SCRUB TURNAROUND, THE PRECEDING LAUNCH SCRUB POST DRAIN WALKDOWN AND THIS PRE-LAUNCH WALKDOWN MAY BE PERFORMED COINCIDENTLY.

INSPECTIONS MAY ALSO BE PERFORMED FROM THE RSS, GOX VENT ARM (GVA), -Y OWP, OR +Y OWP IF STILL EXTENDED AND ACCESSIBLE.

NASA ET MECHANICAL ENGINEER (PK-H) OR DESIGNEE SHALL FUNCTION AS TEAM LEADER. FOLLOWING PERSONNEL ARE (OPTIONAL) WALKDOWN PARTICIPANTS.

NASA ENGR	(4)
SFOC ENGR	(2)
LM - LSS	(1)
BNA - LSS	(1)
USBI - LSS	(1)
THIOKOL - LSS	(1)

DATE: 04-22-00

OMI NO. - S6444
REV. - I

PRE-OPERATION SETUP INSTRUCTIONS

SEQ	CMD	RESP	DESCRIPTION	VERIF.
02-006			DEBRIS INSPECTION TEAM PERFORM WALKDOWN OF SSV AND MLP PER FOLLOWING:	

1. TEAM LEADER VERIFY S6444 PRE-TEST BRIEFING COMPLETE.

2. ASSEMBLE FOLLOWING ESSENTIAL PERSONNEL

   NASA PK-H ENGINEERING - 1

   SFOC ETM ENGINEERING - 1

3. INSPECT FOLLOWING AREAS (AS A MINIMUM) FROM THE MLP, RSS AND FSS TO IDENTIFY/ RESOLVE POTENTIAL DEBRIS SOURCES. RECORD DISCREPANCIES IN S0007 APPENDIX K. SUBMIT COPY TO PAD LEADER AND NOTIFY NTD/TBC.

   AREAS TO BE INSPECTED

   A. LAUNCH VEHICLE EXTERNAL SURFACES

      - ORBITER

      - SRB'S

      - EXTERNAL TANK

   B. MLP SURFACES

      - LH AND RH SRB HOLDDOWN POSTS

      - DECK INCLUDING DECK BOLTS, FIXTURES, AND EDGE GUTTERS

      - SSME LH AND RH SRB EXHAUST OPENINGS, AND SOUND SUPPRESSION (SS) TROUGHS

      - TSM'S AND CAMERA HOUSINGS

4. REF APPENDIX A, DOCUMENT AND SIM PHOTOGRAPH SSV AND LAUNCH PAD CONFIGURATION.

   STC - N/A

   DESCRIPTION: PRE LAUNCH WALKDOWN.

USA VM 070

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PRE-OPERATION SETUP INSTRUCTIONS

SEQ	CMD	RESP	DESCRIPTION	VERIF.
02-007			PRE-LAUNCH WALKDOWN COMPLETE. ALL DISCREPANCIES RECORDED IN S0007 APPENDIX K AND COPY SUBMITTED TO PAD LEADER. VERIFY NO CONSTRAINTS TO CONTINUE. PK-H Robert T. Speer DATE 2-7-01 ETM R Brewer DATE 2-7-01	
02-008			ET PRE-OPERATION SETUP 2 - PRE-LAUNCH WALKDOWN COMPLETE.	

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PRE-OPERATION SETUP INSTRUCTIONS

SEQ	CMD	RESP	DESCRIPTION	VERIF.

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PRE-OPERATION SETUP INSTRUCTIONS

SEQ	CMD	RESP	DESCRIPTION	VERIF.
02-009			PRE-OPERATION SETUP 3 - ICE FROST DEBRIS CONSOLE INITIAL CONFIGURATION SETUP	
			NOTE THE NEXT STEP SETS UP THE PHOTO PROCESSING LAPTOP FOR USE IN THE FIRING ROOM. THIS IS NOT A CONSTRIANT TO SET UP OF THE CONSOLE OR TO ICE DEBRIS TEAM OPERATIONS. NETWORK OR EQUIPMENT FAILURES ON THE PHOTO PROCESSING MACHINE SHALL BE ANNOTATED BELOW.	
02-010			CONNECT TO KSC GROUNDOPS NETWORK AND CONFIGURE LAPTOP COMPUTER TO PERFORM PHOTO PRECESSING/ ANALYSIS.	
			NOTES ok	
			NOTE THE NEXT STEP VERIFIES THE SETUP OF THE INFRARED SCANNERS. THIS IS NOT A CONSTRAINT TO SET UP OF THE ICE CONSOLE. IR SCANNER CONDITION SHALL BE ANNOTATED BELOW.	
02-011			VERIFY IR SCANNER OPERATION CONDITION, ANNOTATE BELOW. RSS: ok CS 2: ok	

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PRE-OPERATION SETUP INSTRUCTIONS

SEQ	CMD	RESP	DESCRIPTION	VERIF.
			NOTE THE NEXT STEP VERIFIES THE OPERATION OF CONSOLE MONITORS IN THE FIRING ROOM. THIS IS NOT A CONSTRAINT TO SET UP OF THE CONSOLE OR TO ICE DEBRIS TEAM OPERATIONS. EQUIPMENT CONDITION SHALL BE ANNOTATED BELOW.	
02-012			VERIFY CONSOLE CONDITION BY POWERING ON MONITORS AND TAPE RECORDERS. MONITORS: UP AND READY TAPE RECORDERS: READY	

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PRE-OPERATION SETUP INSTRUCTIONS

SEQ	CMD	RESP	DESCRIPTION	VERIF.
			NOTE ET OTV PRE-MAPPING/INITIAL POSITION OF CAMERAS MAY BE PERFORMED IN ANY ORDER. FOV DISIGNATES FIELD-OF VIEW. RSS AND -Y OWP MUST BE RETRACTED FOR COMPLETION OF PRE-MAPPING. PRE-MAPPING STEPS/SUBSTEPS IN THE REMAINDER OF THIS PRE-OPERATION SETUP NEED NOT BE PERFORMED IF SUPPORTING A SCRUB TURNAROUND AND IF PERFORMED DURING A PREVIOUS RUN. IT IS PERFERRED TO RECORD ALL PRE-MAPPING SCANNING ON A SINGLE TAPE. HOWEVER, MULTIPLE TAPES MAY BE USED WHEN LIGHTING/ LAUNCH COUNTDOWN CONSTRAINTS NECESSITATE SUCH.	
02-013	CVM1		SET UP RECORDER FOR CAMERA 061/161 CONFIGURATION AS FOLLOWS: 1. SELECT CAMERA 061/161 ON TROUBLE MONITOR. 2. START RECORDER AND RECORD START TIME (GMT). 061/161 START 12:39 NOT PERFORMED N/A SS2	

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PRE-OPERATION SETUP INSTRUCTIONS

SEQ	CMD	RESP	DESCRIPTION	VERIF.
02-014	CVM1	JTV1	PERFORM PRE-MAP AND SET INITIAL POSITION OF CAMERA 061/161 AS FOLLOWS:	
			1. SCAN VISIBLE ET SURFACES	
			NOT PERFORMED N/A SS1	
			2. POSITION CAMERA FULL ZOOM IN. ADJUST FOV UNTIL ET LOX TANK-TO-INERTANK SPLICE IS CENTERED VERTICALLY AND VIEW IS PERPENDICULAR TO ET, PAN RIGHT UNTIL EDGE OF THE ET COMES INTO VIEW (LOX TANK MAY DROP/PASS OUT OF VIEW).	
02-015	CVM1		SHUT DOWN RECORDER AND DOCUMENT SCAN AS FOLLOWS:	
			1. STOP RECORDER.	
			2. RECORD STOP TIME (GMT) AND ANY NOTES.	
			061/161 STOP 12:47	
			NOTES Some slew spots	
			NOT PERFORMED N/A	
02-016	CVM1		SET UP RECORDER FOR CAMERAS 013/113, 060/160, 062/162 CONFIGURATION AS FOLLOWS:	
			1. SELECT CAMERA 013/131, 060/160, 062/162 ON TROUBLE MONITOR.	
			2. START RECORDER AND RECORD START TIME (GMT).	
			062/162 START 12:48	
			013/113 START 12:54	
			060/160 START 13:39	
			NOT PERFORMED N/A SS2	

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PRE-OPERATION SETUP INSTRUCTIONS

SEQ	CMD	RESP	DESCRIPTION	VERIF.
02-017	CVM1	JTV1	PERFORM PRE-MAP AND SET OF INITIAL POSITION OF CAMERA 013/113, 060/160, 062/162 AS FOLLOWS:	
			1. SCAN VISIBLE ET SURFACES.	
			NOT PERFORMED N/A SS1	
			2. POSITION CAMERA FULL ZOOM IN VIEWING THE GOX VENT LOUVERS (013/113, 060/160 VIEWING THE -Y LOUVER AND 062/162 VIEWING THE +Y LOUVER).	
02-018	CVM1		SHUT DOWN RECORDER AND DOCUMENT SCAN AS FOLLOWS:	
			1. STOP RECORDER.	
			2. RECORD STOP TIME (GMT) AND ANY NOTES.	
			062/162 STOP 12:48	
			NOTES Some Sun Spots	
			013/113 STOP 12:53	
			NOTES Some Sun | Bright Spots	
			060/160 STOP 13:41	
			NOTES Some Sun Spots	
			NOT PERFORMED N/A	
02-019	CVM1		SET UP RECORDER FOR CAMERAS 065/165 CONFIGURATION AS FOLLOWS:	
			1. SELECT CAMERA 065/165 ON TROUBLE MONITOR.	
			2. START RECORDER AND RECORD START TIME (GMT).	
			065/165 START 12:43	
			NOT PERFORMED N/A SS2	

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PRE-OPERATION SETUP INSTRUCTIONS

SEQ	CMD	RESP	DESCRIPTION	VERIF.
02-020	CVM1	JTV1	PERFORM PRE-MAP AND SET OF INITIAL POSITION OF CAMERA 065/165 AS FOLLOWS:	
			1. SCAN VISIBLE ET SURFACES.	
			NOT PERFORMED	N/A SS1
			2. POSITION CAMERA FULL ZOOM OUT. SET FOV ON AFT PART OF ET WITH BOTTOM OF FRAME APPROXIMATELY 2 FT BELOW ET AFT DOME.	
02-021	CVM1		SHUT DOWN RECORDER AND DOCUMENT SCAN AS FOLLOWS:	
			1. STOP RECORDER.	
			2. RECORD STOP TIME (GMT) AND ANY NOTES.	
			065/165 STOP 12:49	
			NOTES Some Sun spots	
			NOT PERFORMED	N/A
02-022	CVM1		SET UP RECORDER FOR CAMERAS 067/167 CONFIGURATION AS FOLLOWS:	
			1. SELECT CAMERA 067/167 ON TROUBLE MONITOR.	
			2. START RECORDER AND RECORD START TIME (GMT).	
			067/167 START 12:48	
			NOT PERFORMED	N/A SS2
02-023	CVM1	JTV1	PERFORM PRE-MAP AND SET OF INITIAL POSITION OF CAMERA 067/167 AS FOLLOWS:	
			1. SCAN VISIBLE ET SURFACES.	
			NOT PERFORMED	N/A SS1
			2. SET FOV SUCH THAT ET AFT DOME IS TOWARD FRAME BOTTOM AND SECOND BLACK RING ON SRB IS IN FRAME.	

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PRE-OPERATION SETUP INSTRUCTIONS

SEQ	CMD	RESP	DESCRIPTION	VERIF.
02-024	CVM1		SHUT DOWN RECORDER AND DOCUMENT SCAN AS FOLLOWS: 1. STOP RECORDER. 2. RECORD STOP TIME (GMT) AND ANY NOTES. 067/167 STOP 13:05 NOTES Some Sun spots NOT PERFORMED N/A	
02-025	CVM1		SET UP RECORDER FOR CAMERAS 054/154 CONFIGURATION AS FOLLOWS: 1. SELECT CAMERA 054/154 ON TROUBLE MONITOR. 2. START RECORDER AND RECORD START TIME (GMT). 054/154 START 13:06 NOT PERFORMED N/A SS2	
02-026	CVM1	JTV1	PERFORM PRE-MAP AND SET OF INITIAL POSITION OF CAMERA 054/154 AS FOLLOWS: 1. SCAN VISIBLE ET SURFACES. NOT PERFORMED N/A SS1 2. SET FOV TO ENCOMPASS APPROXIMATELY 3 FT FORWARD OF XT 2058 TO 2 FT AFT OF XT 2058. ORBITER WING AND SRB SHOULD BE IN VIEW.	
02-027	CVM1		SHUT DOWN RECORDER AND DOCUMENT SCAN AS FOLLOWS: 1. STOP RECORDER. 2. RECORD STOP TIME (GMT) AND ANY NOTES. 054/154 STOP 13:29 NOTES Spots NOT PERFORMED N/A	

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PRE-OPERATION SETUP INSTRUCTIONS

SEQ	CMD	RESP	DESCRIPTION	VERIF.
02-028	CVM1		SET UP RECORDER FOR CAMERAS 055/155 CONFIGURATION AS FOLLOWS:	
			1. SELECT CAMERA 055/155 ON TROUBLE MONITOR.	
			2. START RECORDER AND RECORD START TIME (GMT).	
			055/155 START 13:47	
			NOT PERFORMED	N/A SS2
02-029	CVM1	JTV1	PERFORM PRE-MAP AND SET OF INITIAL POSITION OF CAMERA 055/155 AS FOLLOWS:	
			1. SCAN VISIBLE ET SURFACES.	
			NOT PERFORMED	N/A SS1
			2. SET FOV ON NORTH BRIDGE LH2 PIPELINE FLANGE.	
02-030	CVM1		SHUT DOWN RECORDER AND DOCUMENT SCAN AS FOLLOWS:	
			1. STOP RECORDER.	
			2. RECORD STOP TIME (GMT) AND ANY NOTES.	
			055/155 STOP 13.50	
			NOTES Spots	
			NOT PERFORMED	N/A
02-031	CVM1		SET UP RECORDER FOR CAMERAS 056/156 CONFIGURATION AS FOLLOWS:	
			1. SELECT CAMERA 056/156 ON TROUBLE MONITOR.	
			2. START RECORDER AND RECORD START TIME (GMT).	
			056/156 START 13:20	
			NOT PERFORMED	N/A SS2

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PRE-OPERATION SETUP INSTRUCTIONS

SEQ	CMD	RESP	DESCRIPTION	VERIF.
02-032	CVM1	JTV1	PERFORM PRE-MAP AND SET OF INITIAL POSITION OF CAMERA 056/156 AS FOLLOWS:	
			1. SCAN VISIBLE ET SURFACES.	
			NOT PERFORMED N/A SS1	
			2. SET FOV SUCH THAT ET AFT DOME IS TOWARD FRAME BOTTOM AND XT 2058 IS IN FRAME.	
02-033	CVM1		SHUT DOWN RECORDER AND DOCUMENT SCAN AS FOLLOWS:	
			1. STOP RECORDER.	
			2. RECORD STOP TIME (GMT) AND ANY NOTES.	
			056/156 STOP 13:30	
			NOTES SPOTS	
			NOT PERFORMED N/A	
02-034	CVM1		SET UP RECORDER FOR CAMERAS 033/133 CONFIGURATION AS FOLLOWS:	
			1. SELECT CAMERA 033/133 ON TROUBLE MONITOR.	
			2. START RECORDER AND RECORD START TIME (GMT).	
			033/133 START 13:28	
			NOT PERFORMED N/A SS2	

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PRE-OPERATION SETUP INSTRUCTIONS

SEQ	CMD	RESP	DESCRIPTION	VERIF.
02-035	CVM1	JTV1	PERFORM PRE-MAP AND SET OF INITIAL POSITION OF CAMERA 033/133 AS FOLLOWS:	
			1. SCAN VISIBLE ET SURFACES.	
			NOT PERFORMED	N/A SS1
			2. SET FOV PERPENDICLUAR TO ET WITH TOP OF INTERTANK AT FRAME TOP AND BOTTOM OF INTERTANK AT FRAME BOTTOM. THEN TILT DOWN UNTIL XT 2058 IS IN APPROXIMATELY FRAME CENTER.	
02-036	CVM1		SHUT DOWN RECORDER AND DOCUMENT SCAN AS FOLLOWS:	
			1. STOP RECORDER.	
			2. RECORD STOP TIME (GMT) AND ANY NOTES.	
			033/133 STOP 13:33	
			NOTES Bright Sun Spots / Some Shadows	
			NOT PERFORMED	N/A
02-037	CVM1		SET UP RECORDER FOR CAMERAS 066/166 CONFIGURATION AS FOLLOWS:	
			1. SELECT CAMERA 066/166 ON TROUBLE MONITOR.	
			2. START RECORDER AND RECORD START TIME (GMT).	
			066/166 START 13:34	
			NOT PERFORMED	N/A SS2

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PRE-OPERATION SETUP INSTRUCTIONS

SEQ	CMD	RESP	DESCRIPTION	VERIF.
02-038	CVM1	JTV1	PERFORM PRE-MAP AND SET OF INITIAL POSITION OF CAMERA 066/166 AS FOLLOWS:	
			1. SCAN VISIBLE ET SURFACES.	
			NOT PERFORMED N/A SS1	
			2. SET FOV PERPENDICLUAR TO ET WITH TOP OF INTERTANK AT FRAME TOP AND BOTTOM. THEN TILT DOWN UNTIL INTERSECTION OF ORBITER WING AND SRB IS IN FRAME LOWER RIGHT CORNER.	
02-039	CVM1		SHUT DOWN RECORDER AND DOCUMENT SCAN AS FOLLOWS:	
			1. STOP RECORDER.	
			2. RECORD STOP TIME (GMT) AND ANY NOTES.	
			066/166 STOP 13:39	
			NOTES Scan spots / shadows	
			NOT PERFORMED N/A	
02-040	CVM1		SET UP RECORDER FOR CAMERAS 009/109, 063/163, 064/164 CONFIGURATION AS FOLLOWS:	
			1. SELECT CAMERA 009/109, 063/163, 064/164 ON TROUBLE MONITOR.	
			2. START RECORDER AND RECORD START TIME (GMT).	
			009/109 START 13:47	
			063/163 START 13:07	
			064/164 START 13:21	
			NOT PERFORMED N/A SS2	

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PRE-OPERATION SETUP INSTRUCTIONS

SEQ	CMD	RESP	DESCRIPTION	VERIF.
02-041	CVM1	JTV1	PERFORM PRE-MAP AND SET OF INITIAL POSITION OF CAMERA 009/109, 063/163, 064/164 AS FOLLOWS:	
			1. SCAN VISIBLE ET SURFACES.	
			NOT PERFORMED	N/A SS1
			2. SET FOV ON LH2 UMBILICAL. VIEW SHOULD INCLUDE ET-TO-ORBITER INTERFACE AND LH2 RECIRC LINE.	
02-042	CVM1		SHUT DOWN RECORDER AND DOCUMENT SCAN AS FOLLOWS:	
			1. STOP RECORDER.	
			2. RECORD STOP TIME (GMT) AND ANY NOTES.	
			009/109 STOP 13:51	
			NOTES Auto White / Sun Spots / Shadows	
			063/163 STOP 13:20	
			NOTES Some Bright Spots	
			064/164 STOP 13:21	
			NOTES Some Bright Spots	
			NOT PERFORMED	N/A
02-043	CVM1		SET UP RECORDER FOR CAMERAS 004/104 CONFIGURATION AS FOLLOWS:	
			1. SELECT CAMERA 004/104 ON TROUBLE MONITOR.	
			2. START RECORDER AND RECORD START TIME (GMT).	
			004/104 START 12:58	
			NOT PERFORMED	N/A SS2

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PRE-OPERATION SETUP INSTRUCTIONS

SEQ	CMD	RESP	DESCRIPTION	VERIF.
02-044	CVM1	JTV1	PERFORM PRE-MAP AND SET OF INITIAL POSITION OF CAMERA 004/104 AS FOLLOWS:	
			1. SCAN VISIBLE ET SURFACES.	
			NOT PERFORMED	N/A SS1
			2. SET FOV CENTERED ON THE GROUND UMBILICAL CARRIER PLATE (GUCP).	
02-045	CVM1		SHUT DOWN RECORDER AND DOCUMENT SCAN AS FOLLOWS:	
			1. STOP RECORDER.	
			2. RECORD STOP TIME (GMT) AND ANY NOTES.	
			004/104 STOP 13:06	
			NOTES Very Bright Spots	
			NOT PERFORMED	N/A
02-046	CVM1		SET UP RECORDER FOR CAMERAS 042/142 CONFIGURATION AS FOLLOWS:	
			1. SELECT CAMERA 042/142 ON TROUBLE MONITOR.	
			2. START RECORDER AND RECORD START TIME (GMT).	
			042/142 START 13:53	
			NOT PERFORMED	N/A SS2
02-047	CVM1	JTV1	PERFORM PRE-MAP AND SET OF INITIAL POSITION OF CAMERA 042/142 AS FOLLOWS:	
			1. SCAN VISIBLE ET SURFACES.	
			NOT PERFORMED	N/A SS1
			2. SET FOV WITH OAA-TO-ORBITER INTERFACE AT FRAME CENTER.	

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PRE-OPERATION SETUP INSTRUCTIONS

SEQ	CMD	RESP	DESCRIPTION	VERIF.
02-048	CVM1		SHUT DOWN RECORDER AND DOCUMENT SCAN AS FOLLOWS:	
			1. STOP RECORDER.	
			2. RECORD STOP TIME (GMT) AND ANY NOTES.	
			042/142 STOP 13:57	
			NOTES Spots	
			NOT PERFORMED N/A	
			NOTE	
			PRE-MAPPING NOT REQUIRED ON THE FOLLOWING TWO CAMERAS BECAUSE OF THE DISTANCE FROM SSV AND THE LIMITED FIELD OF FIEW.	
02-049	CVM1 JTV1		SET OF INITIAL POSITION OF CAMERA 070/170, 071/171 AS FOLLOWS:	
			SELECT DOWN WIND FOV CAMERA, POSITION TO WIDE ANGLE OF SSV. SELECT UPWIND FOV CAMERA, POSITION TO VIEW SSME.	
02-050			ET PRE-OPERATION SETUP 3 - ISC FROST DEBRIS INITIAL CONFIGURATION SETUP COMPLETE.	
			ETM R Brewer DATE 02-07-01	

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SECTION III

OPERATION SUPPORT SETUP INSTRUCTIONS

SEQ	CMD	RESP	DESCRIPTION	VERIF.
03-000			OPERATION SUPPORT SETUPS - ORBITER	
03-001			OPERATION SUPPORT SETUP 1 - GROUP 1 MONITORING	

LO2 CHILL DOWN THRU T-0

NOTE

DO NOT PERFORM THIS OPERATION SUPPORT SETUP IF LAUNCH SCRUB DECLARED BEFORE LO2 CHILL DOWN COMMENCES.

OPERATION SUPPORT SETUP 1 NOT PERFORMED NA

NOTE

THIS OPERATION SUPPORT SETUP MONITORS LO2 OGIVE AND BARREL AND ASSOCIATED COMPONENTS/ AREAS FROM START OF CHILL DOWN THRU T-0 VIA OTV CAMERAS 013/113, 060/160, 061/161, 062/162, 063/163 ~~AND~~ 064/164, 068/168 AND 069/169

WC 126 USA Dos 03 Trip 01 WC 126 USA OCT 5 '00 OCT 5 '00

OTV CAMERAS 013/113 AND/OR 062/162 WILL VIEW -Y GOX VENT HOOD SEAL AT ALL TIMES. AT NO TIME WILL BOTH CAMERAS BE POSITIONED AWAY FROM THE -Y GOX VENT HOOD SEAL.

STEPS IN THIS SEQUENCE ARE CONTINGENT UPON PROGRESSION OF LAUNCH COUNTDOWN OPERATIONS AND MAY BE NOT PERFORMED IF COUNTDOWN IS TERMINATED.

NOTED REQUIREMENTS SATISFIED BY COMPLETION OF THIS OPERATION SUPPORT SETUP.

OMRS S00FB0.005-1
OMRS S00L00.150-1

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OPERATION SUPPORT SETUP INSTRUCTIONS

SEQ	CMD	RESP	DESCRIPTION	VERIF.
			LO2 CHILL DOWN TO L-1.5 HOUR MARK	
03-002	CVM1	JYVR 138	AT START OF VEHICLE LO2 CHILL DOWN, START RECORDERS FOR CAMERAS 004/104, 013/113, 060/160, 061/161, 062/162, 063/163 ~~AND~~ 064/164, 068/168 AND 069/169	COMM
			ETM ET 05 DATE 2-7-01	
03-003			RECORD LO2 MPS CHILL DOWN START DATE AND TIME (GMT).	
			LO2 MPS CHILL DOWN DATE 2-7-01	
			TIME 13:56 GMT	
			ETM ET 05 DATE 2-7-01	
03-004	CVM1	JTV1 223	FROM START OF LO2 CHILL DOWN UNTIL START OF LO2 FAST-FILL ON OTV CAMERAS 004/104, 013/113, 060/160, 061/161, 062/162, 063/163 AND 064/164 MONITOR/VIDEOTAPE ET-TPS SURFACES. NO CRYOGENIC LIQUID OR EXCESSIVE VAPORS ALLOWED.	COMM
			ETM R Brewer DATE 2-7-01	
			NOT PERFORMED N/A	
03-005			RECORD LO2 SLOW FILL START DATE AND TIME (GMT).	2-7-01 ET 05
			LO2 SLOW FILL DATE 2-7-01 TIME ~~13:53~~ 14:21 GMT	
			ETM R Brewer DATE 2-7-01	
			NOT PERFORMED N/A	
03-006			RECORD LO2 FAST FILL START DATE AND TIME (GMT).	
			LO2 FAST FILL DATE 2-7-01 TIME 14:33 GMT	
			ETM R Brewer DATE 2-7-01	
			NOT PERFORMED N/A	

WC 126 USA Dev 03 P Dev 01 WC 126 USA OCT 5 '00

WC 126 USA Dev 03 P Dev 01 ET 01 2/7/01 SEE DEV OCT 5 '00

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OPERATION SUPPORT SETUP INSTRUCTIONS

SEQ	CMD	RESP	DESCRIPTION	VERIF.
03-007	CVM1 223	JTV1	FROM START OF LO2 FAST-FILL UNTIL LO2 STABLE REPLENISH MODE IS ESTABLISHED, MONITOR/VIDEOTAPE ET-TPS SURFACES ON OTV CAMERAS 004/104, 013/113, 060/160, 061/161, 062/162, 063/163 AND 064/164. SCAN LO2 TANK. ALTERNATE CAMERAS AND SCAN FROM INTERTANK TO LO2 BARREL SPLICE TO GOX VENT HOOD. NO CRYOGENIC LIQUID OR EXCESSIVE VAPORS ALLOWED. ETM R Brewer DATE 2-7-01 NOT PERFORMED N/A	COMM
03-008			RECORD LO2 TOPPING DATE AND TIME (GMT). LO2 TOPPING DATE 2-7-01 TIME 16:33 GMT ETM R Brewer DATE 02-7-01 NOT PERFORMED N/A	
03-009			RECORD LO2 STABLE REPLENISH MODE START DATE AND TIME (GMT). LO2 REPLENISH DATE 2-7-01 TIME 16:40 GMT ETM R Brewer DATE 2-7-01 NOT PERFORMED N/A	
03-010	CVM1 223	JTV1	FROM TIME LO2 STABLE REPLENISH MODE IS ESTABLISHED UNTIL TIME FOR FINAL SCAN (APPROXIMATELY L-1.5 HOURS), MONITOR, SCAN AND VIDEOTAPE ET-TPS SURFACES ON OTV CAMERAS 004/104, 013/113, 060/160, 061/161, 062/162, 063/163 AND 064/164. NO CRYOGENIC LIQUID OR EXCESSIVE VAPORS ALLOWED. ETM R Brewer DATE 2-7-01 NOT PERFORMED N/A	COMM

ET 05
2-7-01

OPERATION SUPPORT SETUP INSTRUCTIONS

SEQ	CMD	RESP	DESCRIPTION	VERIF.

L-1.5 HOUR FINAL SCAN

NOTE

FINAL SSV SCAN SHOULD BEGIN NOT LATER THAN 1 HOUR PRIOR TO START OF T-9 MINUTE HOLD (APPROXIMATELY L-1.5 HOURS) TO ALLOW AMPLE TIME TO FINISH. FINAL SSV SCAN SHALL INCLUDE THE ET, SRB'S AND THE ORBITER.

FINAL SCAN MAY BE ALTERED OR PARTIALLY PERFORMED IN THE EVENT THAT TIME CONSTRAINTS WILL NOT PERMIT A COMPLETE SSV SCAN PRIOR TO START OF T-9 MINUTE HOLD.

03-011	CVM1 JTV1 223		PERFORM FINAL SCAN WITH OTV CAMERAS 004/104, 013/113, 060/160, 061/161, 062/162, 063/163 AND 064/164. SCAN PASSES SHALL VIEW ENTIRE SSV WITH CAMERAS AT APPROXIMATE FULL ZOOM IN DURING FINAL SCAN. ME 10	COMM

ETM _____ DATE 2/7/01

NOT PERFORMED NA

ET 01

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OPERATION SUPPORT SETUP INSTRUCTIONS

SEQ	CMD	RESP	DESCRIPTION	VERIF.

TERMINAL COUNT CAMERA POSITIONS

NOTE

THIS STEP PERFORMED FOR SSME IGNITION ONLY AND MAY BE NOT PERFORMED IF LAUNCH IS SCRUBBED PRIOR TO PICK-UP OF T-9 MINUTE COUNT. CAMERAS MUST BE POSITIONED FOR IGNITION NO LATER THAN T-9 MINUTES. "SPOT" SCANNING AFTER PICK-UP OF THE T-9 MINUTE COUNT IS ACCEPTABLE WITH CICE CONCURRENCE.

CAMERAS MAY BE POSITIONED FOR SSME IGNITION IN AN ARBITRARY ORDER.

CAMERA POSITIONS MAY BE ALTERED REAL-TIME WITH CICE CONCURRENCE. ALTERATIONS SHOULD BE DETERMINED PRIOR TO PICK-UP OF T-9 MINUTE COUNT TO ALLOW SUFFICIENT TIME FOR OTV OPERATORS TO REHEARSE CAMERA MOVEMENTS.

GROUP 1 CAMERA POSITIONS FOR SSME IGNITION ARE DEFINED IN APPENDIX B.

03-012 CVM1 JTV1 223 — REF APPENDIX B, POSITION CAMERAS 004/104, 013/113, 042/142, 054/154, 060/160, 062/162 FOR TERMINAL COUNT. — COMM

ET 01

ETM ME 10 DATE 2/7/01

NOT PERFORMED N/A

WC 126 USA OCT 5 '00

03-013 — COMPLETION OF THIS OPERATION SUPPORT SETUP SATISFIES NOTED OMRS REQUIREMENTS.

OMRSD S00FB0.005-1
OMRSD S00L00.150-1

USA VM 070

ETM ME 10 DATE 2/7/01

ME 10 45

2/7/01

OMI NO. - S6444
REV. - I

DATE: 04-22-00

OPERATION SUPPORT SETUP INSTRUCTIONS

SEQ	CMD	RESP	DESCRIPTION	VERIF.
03-014			ORBITER OPERATION SUPPORT SETUP 1 - GROUP 1 MONITORING - LO2 CHILL DOWN THRU T-0 COMPLETE.	

ET
01
46 2/7/01

OPERATION SUPPORT SETUP INSTRUCTIONS

SEQ	CMD	RESP	DESCRIPTION	VERIF.
03-015			OPERATION SUPPORT SETUP 2 - GROUP 2 MONITORING - LH2 CHILL DOWN THRU T-0	
			NOTE DO NOT PERFORM THIS OPERATION SUPPORT SETUP IF LAUNCH SCRUB DECLARED BEFORE START OF LH2 CHILL DOWN.	
			OPERATION SUPPORT SETUP 2 NOT PERFORMED	NA
			NOTE THIS OPERATION SUPPORT SETUP MONITORS LH2 BARREL AND ASSOCIATED COMPONENTS/AREAS START OF LH2 CHILL DOWN TO PRE-PRESSURIZATION VIA OTV CAMERAS 009/109, 033/133, 054/154, 055/155, 056/156, 065/165, 066/166 AND 067/167. STEPS IN THIS SEQUENCE ARE CONTINGENT UPON PROGRESSION OF LAUNCH COUNTDOWN OPERATIONS AND MAY BE NOT PERFORMED IF COUNTDOWN IS TERMINATED. NOTED REQUIREMENTS SATISFIED BY COMPLETION OF THIS OPERATION SUPPORT SETUP. OMRS S00FB0.005-1 OMRS S00FB0.360-1	
			LH2 CHILL DOWN TO L-1.5 HOUR MARK	
03-016	CVM2 138	JYVR	AT START OF LH2 CHILL DOWN, START RECORDERS FOR CAMERAS 009/109, 033/133, 054/154, 055/155, 056/156, 065/165, 066/166 AND 067/167.	COMM

ETM R Brewer DATE 2-7-01

2/8/01

ME 10

DATE: 04-22-00

OMI NO. - S6444
REV. - I

OPERATION SUPPORT SETUP INSTRUCTIONS

SEQ	CMD	RESP	DESCRIPTION	VERIF.
03-017			RECORD LH2 CHILL DOWN START DATE AND TIME (GMT). LH2 CHILL DOWN DATE 2-7-01 TIME 13:53 GMT ETM R Brewer DATE 2-7-01	
03-018	CVM2 225	JTV2	FROM START OF PROPELLANT LOADING UNTIL START OF LH2 FAST-FILL ON OTV CAMERAS 033/133, 054/154, 055/155, 056/156, 065/165, 066/166 AND 067/167, MONITOR/VIDEOTAPE ET-TPS SURFACES. NO CRYOGENIC LIQUID OR EXCESSIVE VAPORS ALLOWED. ETM R Brewer DATE 2-7-01 NOT PERFORMED N/A	COMM
03-019			RECORD LH2 SLOW FILL START DATE AND TIME (GMT). LH2 SLOW FILL DATE 2-7-01 TIME 13:53 GMT ETM R Brewer DATE 2-7-01 NOT PERFORMED N/A	
03-020			RECORD LH2 FAST FILL START DATE AND TIME (GMT). LH2 FAST FILL DATE 2-7-01 TIME 14:33 GMT ETM R Brewer DATE 2-7-01 NOT PERFORMED N/A	
03-021	CVM2 225	JTV2	FROM START OF LH2 FAST FILL UNTIL STABLE REPLENISH MODE IS ESTABLISHED, SCAN LH2 TANK. ALTERNATE OTV CAMERAS 033/133, 054/154, 055/155, 056/156, 065/165, 066/166 AND 067/167 AND SCAN/VIDEOTAPE FROM LH2 AFT DOME TO INTERTANK. ETM R Brewer DATE 2-7-01 NOT PERFORMED N/A	COMM

2-7-01
ET 05

DATE: 04-22-00

OMI NO. - S6444
REV. - I

OPERATION SUPPORT SETUP INSTRUCTIONS

SEQ	CMD	RESP	DESCRIPTION	VERIF.
03-022			RECORD START DATE AND TIME (GMT) FOR LH2 TOPPING. LH2 TOPPING DATE 2-7-01 TIME 15:42 GMT ETM R Brewer DATE 2-7-01 NOT PERFORMED N/A	
03-023			RECORD LH2 STABLE REPLENISH MODE START DATE AND TIME (GMT). LH2 REPLENISH DATE 2-7-01 TIME 16:17 GMT ETM R Brewer DATE 2-7-01 NOT PERFORMED N/A	
03-024	CVM2 JTV2 225		DURING LH2 STABLE REPLENISH MODE AND UNTIL TIME FOR FINAL SCAN (APPROXIMATELY L-1.5 HOURS), ON OTV CAMERAS 033/133, 054/154, 055/155, 056/156, 065/165, 066/166 AND 067/167, MONITOR/VIDEOTAPE ET TPS SURFACES INCLUDING LO2 FEED LINE,LH2 FEED LINE, LH2 RECIRCULATION LINE, LH2 AFT DOME AND MANHOLE COVERS, LH2/LO2 UMBILICALS, AND TSM LH2/LO2 UMBILICALS. NO CRYOGENIC LIQUID OR EXCESSIVE VAPORS ALLOWED. ETM R Brewer DATE 2-7-01 NOT PERFORMED N/A	COMM

2-7-01 ET 05

OPERATION SUPPORT SETUP INSTRUCTIONS

SEQ	CMD	RESP	DESCRIPTION	VERIF.

L-1.5 HOUR FINAL SCAN

NOTE

FINAL SSV SCAN SHOULD BEGIN NOT LATER THAN 1 HOUR PRIOR TO START OF T-9 MINUTE HOLD (APPROXIMATELY L-1.5 HOURS) TO ALLOW AMPLE TIME TO FINISH. FINAL SSV SCAN SHALL INCLUDE THE ET, SRB'S AND THE ORBITER.

FINAL SCAN MAY BE ALTERED OR PARTIALLY PERFORMED IN THE EVENT THAT TIME CONTRAINTS WILL NOT PERMIT A COMPLETE SSV SCAN PRIOR TO START OF T-9 MINUTE HOLD.

03-025	CVM2 JTV2 225		PERFORM FINAL SCAN WITH OTV CAMERAS 009/109, 033/133, 054/154, 055/155, 056/156, 065/165, 066/166 AND 064/164. SCAN PASSES SHALL VIEW ENTIRE SSV WITH CAMERAS AT FULL ZOOM IN DURING FINAL SCAN.	COMM

ETM R Brewer DATE 2-7-01

NOT PERFORMED N/A

2-7-01 ET 05

OPERATION SUPPORT SETUP INSTRUCTIONS

SEQ	CMD	RESP	DESCRIPTION	VERIF.

T-9 MINUTE TERMINAL COUNT

NOTE

NEXT STEP PERFORMED FOR TERMINAL COUNT ONLY AND MAY BE NOT PERFORMED IF LAUNCH IS SCRUBBED PRIOR TO PICK-UP OF T-9 MINUTE TERMINAL COUNT. CAMERAS MUST BE POSITIONED FOR SSME IGNITION NO LATER THAN T-9 MINUTES. 'SPOT' SCANNING AFTER PICK-UP OF THE T-9 MINUTE TERMINAL COUNT IS ACCEPTABLE WITH CICE CONCURRENCE.

CAMERAS MAY BE POSITIONED FOR SSME IGNITION IN AN ARBITRARY ORDER.

CAMERA POSITIONS MAY BE ALTERED REAL-TIME WITH CICE CONCURRENCE. ALTERATIONS SHOULD BE DETERMINED PRIOR TO PICK-UP OF T-9 MINUTE COUNT TO ALLOW SUFFICIENT TIME FOR OTV OPERATORS TO REHEARSE CAMERA MOVEMENTS.

GROUP 2 CAMERA POSITIONS FOR TERMINAL COUNT ARE DEFINED IN APPENDIX C.

03-026	CVM2 JTV2 225		REF APPENDIX C, POSITION CAMERAS 009/109, 033/133, 056/156, 065/165, 066/166 061/161, 070/170, 071/171 AND 067/167 FOR TERMINAL COUNT.	COMM

ETM ME 10 DATE 2-7-01

NOT PERFORMED N/A

2/8/01
ME 10

DATE: 04-22-00

OMI NO. - S6444
REV. - I

OPERATION SUPPORT SETUP INSTRUCTIONS

SEQ	CMD	RESP	DESCRIPTION	VERIF.
03-027			COMPLETION OF THIS OPERATION SUPPORT SETUP SATISFIES NOTED OMRS REQUIREMENTS. OMRSD S00FB0.005-1 USA VM 070 OMRSD S00FB0.360-1 ME 10 ETM _____ DATE 2/7/01	
03-028			ORBITER OPERATION SUPPORT SETUP 2 - GROUP 2 MONITORING - LH2 CHILL DOWN THRU T-0 COMPLETE.	

ME 10 2/8/01

DATE: 04-22-00

OMI NO. - S6444
REV. - I

OPERATION SUPPORT SETUP INSTRUCTIONS

SEQ	CMD	RESP	DESCRIPTION	VERIF.
03-029			OPERATION SUPPORT SETUP 3 - FINAL INSPECTION	

NOTE

FINAL INSPECTION MAY BE NOT PERFORMED DEPENDING ON LO2/LH2 TANKING AND LAUNCH COUNTDOWN, AS DETERMINED BY NTD/TTL.

FINAL INSPECTION TEAM STAY TIME GUIDELINES FOR EACH LEVEL ARE GIVEN IN APPENDIX D. THESE GUIDELINES ARE FOR REFERENCE ONLY AND MAY BE DEVIATED FROM AT TTL DISCRETION.

OPERATION SUPPORT SETUP 3 NOT PERFORMED NA

ET
01
2/1/01

OPERATION SUPPORT SETUP INSTRUCTIONS

SEQ	CMD	RESP	DESCRIPTION	VERIF.

WARNING

PERSONNEL PERFORMING FINAL INSPECTION SHALL BE ATTIRED IN NOMEX COVERALLS WITH GLOVES AND HOODS. PERSONNEL SHALL HAVE AVAILABLE GLOVES, HOODS, AND ELSA'S AT ALL TIMES DURING WALKDOWN.

PERSONNEL WORKING AT HEIGHTS GREATER THAN 4 FT AND WITHIN 6 FT OF AN UNGUARDED EDGE WILL WEAR A SAFETY HARNESS WITH THE LANYARD SECURED TO AN APPROVED TIE OFF POINT, SUBSTANTIAL STRUCTURAL MEMBER (NO HANDRAILS) OR A PROPERLY INSTALLED LIFELINE.

PERSONNEL USING SONY DKC-ID1 CAMERA SHALL VERIFY LITHIUM ION BATTERY IS SECURELY LOCKED IN BAYONETTE CONNECTOR AND THE LITHIUM BUTTON BATTERY DOOR IS LOCKED AND TAPED IN PLACE. PERSONNEL SHALL INSURE THE FLASH IS NOT ACTIVATED ON THE CAMERA.

PERSONNEL USING KODAK DC-50/120 SHALL VERIFY ALKALINE BATTERIES ARE PROPERLY INSTALLED AND THE FLASH IS NOT ACTIVE ON THE CAMERA.

PERSONNEL USING DIGITAL CAMERAS (SONY DKC ID1, KODAK DC-50/120 SHALL NOT USE THESE CAMERAS IN THE PRESENCE OF A HYDROGEN LEAK OR AN OXYGEN ENRICHED ATMOSPHERE (READINGS GREATER THAN 23 PERCENT O2).

ET 01
2/7/01

OPERATION SUPPORT SETUP INSTRUCTIONS

SEQ	CMD	RESP	DESCRIPTION	VERIF.

NOTE

TASK TEAM LEADER (TTL) FOR FINAL INSPECTION IS PK-H. ADDITIONAL PERSONNEL (LISTED BELOW) MAY BE ADDED TO THE FINAL INSPECTION TEAM WITH NTD, LAUNCH DIRECTOR, AND SAFETY CONCURRENCE.

JSC LVL II	(1)
PK-H	(2)
SFOC ETM	(1)

03-030 ASSEMBLE FOLLOWING FINAL INSPECTION TEAM MEMBERS:

TTL - PK-H	(1)
PK-H	(1)
SFOC ETM	(1)
LM LSS	(1)
SFOC SAFETY	(1)

03-031 FINAL INSPECTION TEAM PERFORM WALKDOWN OF SSV AND ASSOCIATED FACILITIES AS FOLLOWS:

ET 01

2/1/01

OPERATION SUPPORT SETUP INSTRUCTIONS

SEQ	CMD	RESP	DESCRIPTION	VERIF.

NOTE

APPENDICES E AND F ARE REFERENCE ONLY ITEMS. IMAGES ARE TO BE TAKEN OF TARGETS OF OPPORTUNITY. IMAGES MUST BE TAKEN WITH 35 MM AND DIGITAL CAMERAS. DIGITAL IMAGES SHALL BE INPUTTED INTO THE SIMS SYSTEM.

1. REF APPENDICES E AND F, PHOTOGRAPH SSV POINTS OF OPPORTUNITY DURING FINAL INSPECTION USING 35 MM. RECORD DATA.

   ROLL NO. 1

   NEGATIVE NO. 1-36

   WORK ORDER NO. E106

2. REFERENCE APPENDICES E AND F, TAKE DIGITAL IMAGE OF SSV POINTS OF OPPORTUNITY USING DIGITAL CAMERA.

   STC: N/A
   DESCRIPTION: FINAL INSPECTION TEAM

3. SEE FIGURES 1 THRU 4, MEASURE AND RECORD (DEG F) SSV EXTERNAL SURFACE TEMPERATURES USING IR GUN(S)/SCANNERS.

ET 01
2/7/01

OPERATION SUPPORT SETUP INSTRUCTIONS

SEQ	CMD	RESP	DESCRIPTION	VERIF.

NOTE

THE NEXT TWO SUBSTEPS REFERENCE INSPECTION AREAS, BUT INSPECTION SHALL NOT BE LIMITED TO THESE AREAS. INSPECTION SHALL BE OF ENTIRE SSV AND SPECIFIC AREAS OF CONCERN. SPECIFIC AREAS OF CONCERN SHALL BE DEFINED BY THE TTL, NTD, OR LAUNCH DIRECTOR.

4. VISUALLY INSPECT ORBITER AFT ENGINE COMPARTMENT EXTERNAL SURFACES FOR CONDENSATION AND ICE FORMATIONS.

5. VISUALLY INSPECT ET TPS SURFACES WHICH CANNOT BE OBSERVED BY THE OTV SYSTEM.

6. VISUALLY INSPECT SPECIFIC AREAS OF CONCERN AS DETERMINED BY THE TTL, NTD, OR LAUNCH DIRECTOR.

OMRSD S00U00.020-A-1
OMRSD S00U00.020-C-1
OMRSD S00U00.020-D-1

USA VM 070

03-032 FINAL INSPECTION COMPLETE. ALL ANOMALIES DOCUMENTED ON APPENDIX H DATA SHEET. VERIFY NO CONSTRAINTS TO CONTINUE.

TTL (PK-H) Robert F. Thomas DATE 2-7-01

SFOC-ETM Mark Wolfram DATE 2-7-01

03-033 ORBITER OPERATION SUPPORT SETUP 3 - FINAL INSPECTION COMPLETE.

ETM _____ ME 10 DATE 2-7-01

2/8/01
ME 01

OPERATION SUPPORT SETUP INSTRUCTIONS

SEQ	CMD	RESP	DESCRIPTION	VERIF.

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DATE: 04-22-00

OMI NO. - S6444
REV. - I

OPERATION SUPPORT SETUP INSTRUCTIONS

SEQ	CMD	RESP	DESCRIPTION	VERIF.
03-034			OPERATION SUPPORT SETUP 4 - LO2/LH2 DRAIN	
			MONITORING	
			NOTE THIS OPERATION SUPPORT SETUP IS CONTINGENT UPON PROGRESSION OF LAUNCH COUNTDOWN AND IS PERFORMED AFTER START OF CRYO (LO2/LH2) LOADING AND SUBSEQUENT LAUNCH SCRUB, FRF, OR WCDDT.	
			OPERATION SUPPORT SETUP 4 NOT PERFORMED	ME 10 2/7/01
			NOTE THIS OPERATION SUPPORT SETUP MONITORS THE EXTERNAL TANK EXTERNAL SURFACES DURING LO2/LH2 DRAIN OPERATIONS FROM TIME OF DETANKING UNTIL 1.5 HOURS AFTER LO2/LH2 LOW LEVEL SENSORS READ DRY VIA OTV 054/154, 055/155, 056/156, 065/165, 066/166 AND 067/167. NOTED REQUIREMENTS SATISFIED BY THIS OPERATION SUPPORT SETUP. OMRS S00E00.021	
03-035	CVM1		AS LO2/LH2 TANK DRAIN OPERATIONS PROCEED: 1. RECORD ANY OBSERVATIONS/CONCERNS ON THE TROUBLE TAPE PER APPENDIX G. 2. DOCUMENT ALL OBSERVATIONS/CONSERNS ON AN APPENDIX H DATA SHEET. ETM_____ DATE_____	NA ME 10 2/8/01

OMI NO. - S6444
REV. - I

DATE: 04-22-00

OPERATION SUPPORT SETUP INSTRUCTIONS

SEQ	CMD	RESP	DESCRIPTION	VERIF.
03-036			RECORD START DATE/TIME (GMT) OF LH2 AND LO2 TANK DRAIN. LH2 DRAIN START DATE_____ TIME_____ GMT LO2 DRAIN START DATE_____ TIME_____GMT ETM_____ DATE_____	
03-037	CVM1 JTV1 223		FROM START OF LO2 TANK DRAIN AND LH2 TANK DRAIN UNTIL RESPECTIVE LO2/LH2 LOW LEVEL SENSORS READ DRY, MONITOR ET EXTERNAL SURFACES INCLUDING LO2 FEED LINE, LH2 FEED LINE, LH2 RECIRCULATION LINE, LH2 AFT DOME AND MANHOLE COVERS, LH2/LO2 UMBILICALS, TSM LH2/LO2 UMBILICALS VIA OTV CAMERAS. NO CRYOGENIC LIQUID OR EXCESSIVE VAPORS ALLOWED. ETM_____ DATE_____	COMM
03-038			RECORD DATE/TIME (GMT) WHEN LO2/LH2 LOW LEVEL SENSORS READ DRY. LH2 SENSORS DRY DATE_____ TIME_____GMT LO2 SENSORS DRY DATE_____ TIME_____GMT ETM_____ DATE_____	
03-039	CVM1 JTV1 223		MONITOR ET EXTERNAL SURFACES INCLUDING LO2 FEED LINE, LH2 FEED LINE, LH2 RECIRCULATION LINE, LH2 AFT DOME AN MANHOLE COVERS, LH2/LO2 UMBILICALS, TSM LH2/LO2 UMBILICALS VIA OTV CAMERAS FOR 1.5 HOURS AFTER LO2/LH2 LOW LEVEL SENSORS HAVE READ DRY. NO CRYOGENIC LIQUID OR EXCESSIVE VAPORS ALLOWED. RECORD DATE/TIME (GMT) WHEN MONTORING COMPLETE. LH2 COMPLETE DATE_____ TIME_____GMT LO2 COMPLETE DATE_____ TIME_____GMT. ETM_____ DATE_____	COMM
03-040			COMPLETION OF THIS OPERATION SUPPORT SETUP SATISFIES NOTED REQUIREMENTS. OMRSD S00E00.021	

USA VM 070

ET 01

2/8/01

DATE: 04-22-00

OMI NO. - S6444
REV. - I

OPERATION SUPPORT SETUP INSTRUCTIONS

SEQ	CMD	RESP	DESCRIPTION	VERIF.
03-041			ORBITER OPERATION SUPPORT SETUP 4 - LO2/LH2 DRAIN MONITORING COMPLETE.	

ET 61
01
2/8/01

OPERATION SUPPORT SETUP INSTRUCTIONS

SEQ	CMD	RESP	DESCRIPTION	VERIF.

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SECTION IV

OPERATION INSTRUCTIONS

SEQ	TIME	CMD	RESP	DESCRIPTION	VERIF.
04-000				SSV DEBRIS ASSESSMENT	
				NOTE STEPS IN THIS SEQUENCE ARE CONTINGENT UPON PROGRESSION OF LAUNCH COUNTDOWN OPERATIONS AND MAY BE NOT PERFORMED IF COUNTDOWN IS TERMINATED.	
				ENTIRE SEQUENCE NOT PERFORMED NA	
				NOTE UNTIL OTHERWISE INDICATED, ALL TIMES ARE REFERENCED TO S0007, S0014 OR S0037 TIMELINES. NO SEQUENCES/STEPS WITHIN THIS SUBTASK OMI MAY BE PERFORMED AS A STAND-ALONE PROCEDURE. THIS OMI MAY ONLY BE PERFORMED AS A SUBTASK TO S0007/S0014/S0037.	
04-001		CTIF TBC 136	TBC CMQC	NOTIFY TBC THAT CTIF WILL PERFORM THE CMQC FUNCTION FOR STS 98, S6444 RUN 1. REQUEST TBC NOTIFY CMQC THAT THE ROR-AS-CMQC OPTION WILL BE EXERCISED FOR STS 98, S6444 RUN 1.	
04-002		NTD 232 TBC 136	TBC CTIF	PERFORM OTV AND ICE/FROST MONITORING AREA SETUPS.	

ETM ME 10 DATE 2/6/01

2/8/01
ME 10

DATE: 04-22-00

OMI NO. - S6444
REV. - I

OPERATION INSTRUCTIONS

SEQ	TIME	CMD	RESP	DESCRIPTION	VERIF.
04-003		CTIF 136 TBC NTD 232	TBC NTD STM	VERIFY SUPPORT PRE-OPERATION SETUP 1 - SUPPORT PREPARATIONS COMPLETE. ETM ME 10 DATE 2/7/01	
04-004		CTIF		VERIFY ET PRE-OPERATION SETUP 1 - ICE PREDICTION BRIEFING AND ET PRE-OPERATION SETUP 2 - PRE-LAUNCH WALKDOWN COMPLETE. ETM ME 10 DATE 2/7/01	

ET 01 2/7/01

DATE: 04-22-00

OMI NO. - S6444
REV. - I

OPERATION INSTRUCTIONS

SEQ	TIME	CMD	RESP	DESCRIPTION	VERIF.
04-005		CTIF 222	CVM1	VERIFY GROUP 1 OTV CAMERAS (013/113, 060/160, 061/161, 062/162, 063/163 AND 064/164) ARE ON, TAPES IN RECORDER, AND READY TO COMMENCE OTV SCANNING, MONITORING AND RECORDING. ETM ME 10 DATE 2/7/01	
04-006		CTIF 222	CVM2	VERIFY GROUP 2 OTV CAMERAS (033/133, 054/154, 055/155, 056/156, 065/165 066/166 AND 067/167) ARE ON, TAPES IN RECORDER, AND READY TO COMMENCE OTV SCANNING, MONITORING AND RECORDING. ETM ME 10 DATE 2/7/01	
04-007		CTIF		VERIFY TROUBLE TAPE RECORDER IS READY. ETM ME 10 DATE 2/7/01	
04-008		CTIF 222	CVM1 CVM2	VERIFY ET PRE-OPERATION SETUP 3 - PRE-MAPPING AND ET PRE-OPERATION SETUP 4 - CAMERA INITIAL POSITIONS COMPLETE. ETM ME 10 DATE 2/7/01	
04-009		CTIF 222 CTIF 138 CVM1 223 CVM2 225	CICE CVM1 CVM2 CIPC JYVR JTV1 JTV2	ALL PERSONNEL PARTICIPATING IN OTV OPERATIONS REPORT TEST READY STATUS. ETM ME 10 DATE 2/7/01	COMM
04-010		CTIF 136 TBC 232	TBC NTD	ICE FROST CONSOLE AREA SETUPS FOR OTV SCANNING COMPLETE. ETM ME 10 DATE 2/7/01	

NOT PERFORMED N/A

ET 01 65

2/7/01

OPERATION INSTRUCTIONS

SEQ	TIME	CMD	RESP	DESCRIPTION	VERIF.
04-011		CTIF 222	CVM1	FROM START OF LO2 CHILLDOWN UNTIL SEAL DEFLATION/GOX VENT HOOD RETRACTION, MONITOR THE +Y/-Y GOX VENT SEAL-TO-ET INTERFACE FOR SEAL FRETTING AND CONTINUOUS GOX ESCAPE. ETM ME 10 DATE 2/7/01 NOT PERFORMED NA	
04-012		CTIF 136	TBC CMEC	IF +Y/-Y GOX VENT SEAL FRETTING OR CONTINUOUS GOX ESCAPE DETECTED FROM START OF LO2 CHILLDOWN UNTIL SEAL DEFLATION, NOTIFY CMEC FOR GOX VENT HOOD REMOVAL. ETM NA DATE 2/7/01 NOT PERFORMED ME 10	
04-013		CTIF 222	CIPC	MONITOR WIND SPEED AND DIRECTION FROM START OF LO2/LH2 CHILL DOWN THRU LAUNCH/SCRUB. CIPC NOTIFY CTIF IF WINDS MEASURED AT 38 KNOTS OR GREATER +/-30 DEGREES FROM NORTH AS MEASURED AT 60 FEET. ME 10 ETM DATE 2/7/01 NOT PERFORMED NA	
04-014		CTIF 222	CVM1	PERFORM OPERATION SUPPORT SETUP 1 - GROUP 1 MONITORING. ETM ME 10 DATE 2/7/01 NOT PERFORMED NA	
04-015		CTIF 222	CVM2	PERFORM OPERATION SUPPORT SETUP 2 - GROUP 2 MONITORING. ETM ME 10 DATE 2/7/01 NOT PERFORMED NA	

ME 10 2/8/01

OPERATION INSTRUCTIONS

SEQ	TIME	CMD	RESP	DESCRIPTION	VERIF.
04-016		CTIF 222	CVM2	ONCE PER HOUR MINIMUM, AFTER START OF LO2/LH2 TANKING (UNTIL LO2/LH2 LOW LEVEL SENSORS READ DRY), SCAN LO2 FEED LINE BRACKETS AND FLANGE CLOSEOUTS PER APPENDIX G. ME 10 ETM _____ DATE 2/7/01 NOT PERFORMED NA	
04-017		CTIF 222	CICE	AS COUNT PROCEEDS, FOR CONCERNS/ OBSERVATIONS IDENTIFIED: 1. RECORD OBSERVATION/CONCERN ON TROUBLE TAPE PER APPENDIX G. 2. DOCUMENT OBSERVED CONDITION ON APPENDIX H DATA SHEET. ME 10 ETM _____ DATE 2/7/01 NOT PERFORMED NA	
04-018		TBC 136 CTIF 222	CTIF CICE	PERFORM OPERATION SUPPORT SETUP 3 - FINAL INSPECTION WHEN CALLED BY S0007/S0014/S0037. ME 10 ETM _____ DATE 2/7/01 NOT PERFORMED NA	
04-019		CTIF 222	CVM1 CVM2	AT L-1.5 HOURS, PERFORM SSV FINAL SCAN. ME 10 ETM _____ DATE 2/7/01 NOT PERFORMED NA	
04-020		CTIF 222	CVM1 CVM2	AT START OF T-9 MINUTE HOLD, CONFIGURE OTV CAMERAS FOR TERMINAL COUNT. ME 10 ETM _____ DATE 2/7/01 NOT PERFORMED NA	

ME 10 2/8/01

OPERATION INSTRUCTIONS

SEQ	TIME	CMD	RESP	DESCRIPTION	VERIF.
04-021				IF WINDS ARE FROM THE NORTH +/-30 DEGREES AND ARE 38 KNOTS OR GREATER: 1. MONITOR/VIDEOTAPE NOSE CONE AREA DURING HIGH WINDS. 2. VERIFY: A. NO ICE FORMATION ON THE +Y AND -Y GOX VENT SEAL FOOTPRINT AREAS. B. NO DAMAGE TO THE ET TPS AT THE +Y AND -Y GOX VENT SEAL FOOTPRINT AREAS. C. NO DAMAGE TO THE +Y AND -Y GOX VENT SEALS THEMSELVES. D. NO EVIDENCE OF GOX LEAKAGE FROM +Y/-Y GOX VENT SEALS TO ET INTERFACE. OMRSD S00L00.150-1 ETM NA DATE 2/7/01 NOT PERFORMED. ME 10 2/8/01	
04-022		CTIF		VERIFY LAUNCH OR LAUNCH SCRUB (DRAIN BACK) RECORD DATA. LAUNCH ✓ SCRUB NA DATE 2/7/01 TIME ① 23:13 GMT SCRUB AT T- NA ETM ME 10 ① DATE 2/7/01	

USA VM 070

ME 10 2/8/01

DATE: 04-22-00

OMI NO. - S6444
REV. - I

OPERATION INSTRUCTIONS

SEQ	TIME	CMD	RESP	DESCRIPTION	VERIF.
				NOTE WHEN COMPLETELY FILLED AND DRAIN IS INITIATED, IT TAKES APPROXIMATELY 1 HOUR UNTIL THE LH2 TANK LOW LEVEL SENSORS READ DRY, AND APPROXIMATELY 1.5 HOURS UNTIL THE LO2 TANK LOW LEVEL SENSORS READ DRY.	
04-023		CTIF 222	CVM1 CVM2	IF LAUNCH SCRUBBED (OR DRAIN BACK DECLARED) AFTER START OF LO2/LH2 SLOW FILL MODE, PERFORM OPERATIONS SUPPORT SETUP 4 - LO2/LH2 DRAIN MONITORING. ETM NA DATE 2/7/01 NOT PERFORMED ME 10 2/8/01	
04-024		CTIF		GOX VENT SEAL-TO-ET INTERFACE MONITORING FOR SEAL FRETTING AND CONTINUOUS GOX ESCAPE COMPLETE. OMRSD S00FB0.350-1 USA VMO ETM ME 10 DATE 2/7/01 NOT PERFORMED NA	
04-025		CTIF 222	CVM1 CVM2	TERMINATE SCANNING OPERATIONS. ETM ME 10 DATE 2/7/01	
04-026		CTIF 222	CVM1 CVM2	PERFORM POST OPERATION INSTRUCTION 1 - CONSOLE SECURING. ETM ME 10 DATE 2/7/01	
04-027		CTIF		IF LO2/LH2 TANKING STARTED, PERFORM POST OPERATION INSTRUCTION 2 - SUMMARY TAPE. ETM ME 10 DATE 2/7/01 NOT PERFORMED NA	

ME 69
10 2/8/01

DATE: 04-22-00

OMI NO. - S6444
REV. - I

OPERATION INSTRUCTIONS

SEQ	TIME	CMD	RESP	DESCRIPTION	VERIF.
				NOTE POST DRAIN WALKDOWN TYPICALLY COMMENCES APPROXIMATELY 1.5 HOURS AFTER LH2/LO2 LOW LEVEL SENSORS READ DRY.	
04-028		CTIF		IF LAUNCH SCRUBBED AFTER START OF LO2/LH2 TANKING, PERFORM POST OPERATION INSTRUCTION 3 - POST DRAIN WALKDOWN. ETM NA DATE / NOT PERFORMED 2/8/01 ME 10	
04-029		CTIF		IF LAUNCH OCCURED, PERFORM POST OPERATION INSTRUCTION 4 - POST LAUNCH WALKDOWN. ME 10 ETM _____ DATE 2/8/01 NOT PERFORMED NA	
04-030		CTIF		IF LAUNCH OCCURED, PERFORM POST OPERATION INSTRUCTION 5 - FILM REVIEW. ETM [signature] DATE 3/6/01 NOT PERFORMED N/A	
04-031				SSV DEBRIS ASSESSMENT COMPLETE.	

ET 01

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SECTION V

POST OPERATION INSTRUCTIONS

SEQ	TIME	CMD	RESP	DESCRIPTION	VERIF.
05-000				POST OPERATION INSTRUCTIONS - ET	
05-001				POST OPERATION INSTRUCTION 1 - CONSOLE SECURING	
05-002		CTIF 136 TBC 232	TBC NTD	OTV SUPPORT FOR ET THERMAL PROTECTION SYSTEM EVALUATION NO LONGER REQUIRED.	
05-003		CTIF 138	JYVR	PERFORM THE FOLLOWING: 1. TURN OFF VIDEO RECORDERS. 2. REMOVE TAPE CARTRIDGES. 3. OTV SUPPORT NO LONGER REQUIRED.	COMM
05-004		CTIF 222	CVM1 CVM2	SECURE CONSOLES BY SETTING ALL MONITORS TO "OFF" POSITION. REPORT COMPLETION. NOTE PERFORM NEXT STEP ONLY AFTER A SUCCESSFUL LAUNCH.	
05-005		CTIF		REMOVE PHOTO PROCESSING LAPTOP COMPUTER FROM FIRING ROOM. NOT PERFORMED N/A	
05-006		CTIF 136 TBC 232	TBC NTD	FIRING ROOM 2, ICE FROST MONITORING AREA SECURING COMPLETE.	
05-007				ET POST OPERATION INSTRUCTION 1 - CONSOLE SECURING COMPLETE. ETM [signature] DATE 2/8/01	

2/8/01

ET 01

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POST OPERATION INSTRUCTIONS

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OMI NO. - S6444
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POST OPERATION INSTRUCTIONS

SEQ	TIME	CMD	RESP	DESCRIPTION	VERIF.
05-008				POST OPERATION INSTRUCTION 2 - SUMMARY TAPE	
				NOTE OBSERVATIONS/CONCERNS OBSERVED DURING COUNT ARE TYPICALLY RECORDED ON THE SUMMARY TAPE REAL-TIME (TROUBLE TAPE).	
05-009		CICE		AFTER LAUNCH OR LAUNCH SCRUB, PREPARE A SUMMARY TAPE TO INCLUDE OBSERVATIONS/CONCERNS NOTED DURING COUNT.	
05-010				ET POST OPERATION INSTRUCTION 2 - SUMMARY TAPE COMPLETE. ETM ME 10 DATE 2/7/01	

ME 10 2/8/1

POST OPERATION INSTRUCTIONS

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POST OPERATION INSTRUCTIONS

SEQ	TIME	CMD	RESP	DESCRIPTION	VERIF.
05-011				POST OPERATION INSTRUCTION 3 - POST DRAIN WALKDOWN	

NOTE

POST DRAIN WALKDOWN PERFORMED ONLY AFTER START OF CRYO (LH2/LO2) LOADING AND SUBSEQUENT LAUNCH SCRUB.

POST OPERATION INSTRUCTION 3 NOT PERFORMED

ME 10 2/7/01

WARNING

PERSONNEL SHALL WEAR FLAME RETARDANT COVERALLS WHILE PERFORMING POST DRAIN WALKDOWN.

PERSONNEL WORKING AT HEIGHTS GREATER THAN 4 FT AND WITHIN 6 FT OF AN UNGUARDED EDGE WILL WEAR A SAFETY HARNESS WITH THE LANYARD SECURED TO AN APPROVED TIE OFF POINT, SUBSTANTIAL STRUCTURAL MEMBER (NO HANDRAILS) OR A PROPERLY INSTALLED LIFELINE.

NOTE

POST DRAIN WALKDOWN TYPICALLY COMMENCES APPROXIMATELY 1.5 HOURS AFTER LH2/LO2 LOW LEVEL SENSORS READ DRY.

POST DRAIN WALKDOWN PERFORMED IN SUPPORT OF A 24 HOUR SCRUB TURNAROUND IS TYPICALLY COINCIDENT WITH THE L-20 HOUR PRE-LAUNCH WALKDOWN FOR THE ENSUING LAUNCH ATTEMPT.

ME 10 2/8/01

DATE: 04-22-00

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POST OPERATION INSTRUCTIONS

SEQ	TIME	CMD	RESP	DESCRIPTION	VERIF.
				NOTE NASA ET MECHANICAL ENGINEER (PK-H) OR DESIGNEE SHALL FUNCTION AS TEAM LEADER. FOLLOWING PERSONNEL ARE WALKDOWN OPTIONAL PARTICIPANTS: NASA ENGR (4) SFOC ENGR (2) LM-LSS (1) BNA (1) SFOC SAFETY (1)	
05-012				NASA LEAD ICE/FROST ENGINEER (PK-H) VERIFY ESSENTIAL PERSONNEL ON STATION, PROPERLY ATTIRED, AND READY TO PROCEED WITH POST DRAIN WALKDOWN. ESSENTIAL PERSONNEL --- NASA ENGINEERING (PK-H) 1 SFOC ENGINEERING (ETM) 1	
05-013				PERFORM POST DRAIN WALKDOWN AS FOLLOWS: 1. VISUALLY INSPECT ET TPS EXTERIOR SURFACES AFTER DETANKING AND WARM-UP (APPROXIMATELY T+4 HOURS AFTER DRAIN IS INITIATED) FROM THE MLP, FSS, AND RSS AS ACCESS PERMITS. 2. PERFORM HANDS-ON INVESTIGATION OF ALL AREAS SUSPECTED OF VIOLATING NSTS 08303 (LI) ICE/DEBRIS INSPECTION CRITERIA. OMRSD S00E00.031	

USA VMO

ET 01

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DATE: 04-22-00

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POST OPERATION INSTRUCTIONS

SEQ	TIME	CMD	RESP	DESCRIPTION	VERIF.
05-014				WALKDOWN COMPLETE. ALL DISCREPANCIES IDENTIFIED. NO CONSTRAINTS TO CONTINUE. NA PK-H_____ DATE_____ ETM_____ DATE_____	
05-015				ET POST OPERATION INSTRUCTION 3 - POST DRAIN WALKDOWN COMPLETE.	

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POST OPERATION INSTRUCTIONS

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POST OPERATION INSTRUCTIONS

SEQ	TIME	CMD	RESP	DESCRIPTION	VERIF.
05-016				POST OPERATION INSTRUCTION 4 - POST LAUNCH WALKDOWN	

NOTE

DO NOT PERFORM THIS POST OPERATION INSTRUCTION AFTER LAUNCH SCRUB.

POST OPERATION INSTRUCTION 4 NOT PERFORMED NA

WARNING

PERSONNEL WORKING AT HEIGHTS GREATER THAN 4 FT AND WITHIN 6 FT OF AN UNGUARDED EDGE WILL WEAR A SAFETY HARNESS WITH THE LANYARD SECURED TO AN APPROVED TIE OFF POINT, SUBSTANTIAL STRUCTURAL MEMBER (NO HANDRAILS) OR A PROPERLY INSTALLED LIFELINE.

FLAME RETARDANT COVERALLS REQUIRED DURING WALKDOWN.

NOTE

NASA ET MECHANICAL ENGINEER (PK-H) OR DESIGNEE SHALL FUNCTION AS TEAM LEADER. FOLLOWING PERSONNEL ARE WALKDOWN OPTIONAL PARTICIPANTS:

NASA ENGR	(3)
SFOC ENGR	(2)
LM-LSS	(1)
BNA	(2)
USBI-LSS	(1)
THIOKOL-LSS	(1)
SFOC SAFETY	(1)

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POST OPERATION INSTRUCTIONS

SEQ	TIME	CMD	RESP	DESCRIPTION	VERIF.
05-017				NASA ET MECHANICAL ENGINEER (PK-H), VERIFY FOLLOWING PERSONNEL ON STATION, PROPERLY ATTIRED, AND READY TO PROCEED WITH POST LAUNCH WALKDOWN. ESSENTIAL PERSONNEL --- PK-H 1 ETM 1	
05-018				PERFORM POST LAUNCH WALKDOWN AS FOLLOWS: 1. REF APPENDIX K, VISUALLY INSPECT POST LAUNCH PAD/AREA TO IDENTIFY ANY LOST FLIGHT OR GROUND SYSTEMS HARDWARE AND DEBRIS SOURCES. 2. REF APPENDIX L, DOCUMENT/ SIMS PHOTOGRAPH LAUNCH PAD AREA CONFIGURATION. STC: N/A DESCRIPTION: POST LAUNCH WALKDOWN OMRSD S00U00.010-1 USA VAN 070	
05-019				WALKDOWN COMPLETE. DEBRIS SOURCES AND LOST FLIGHT HARDWARE IDENTIFIED. NO CONSTRAINTS TO CONTINUE. PK-H Jorge E. Luis DATE 2-08-01 ETM R Brewer DATE 2-08-01	
05-020				ET POST OPERATION INSTRUCTION 4 - POST LAUNCH WALKDOWN COMPLETE.	

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DATE: 04-22-00

OMI NO. - S6444
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POST OPERATION INSTRUCTIONS

SEQ	TIME	CMD	RESP	DESCRIPTION	VERIF.
05-021				POST OPERATION INSTRUCTION 5 - FILM REVIEW	
				NOTE THIS POST OPERATION MAY BE NOT PERFORMED AFTER LAUNCH SCRUB.	
				POST OPERATION INSTRUCTION 5 NOT PERFORMED	NA
05-022				REVIEW ENGINEERING FILMS FOR FOD ISSUES, LAUNCH ANOMALIES OR OTHER DISCREPANCIES.	
05-023				ET POST OPERATION INSTRUCTION 5 - FILM REVIEW COMPLETE. ETM R. Saule DATE 5/10/01	

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5/10/01

POST OPERATION INSTRUCTIONS

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DATE: 04-22-00

OMI NO. - S6444
REV. - I

POST OPERATION INSTRUCTIONS

SEQ	TIME	CMD	RESP	DESCRIPTION	VERIF.
05-024				POST OPERATION INSTRUCTION 6 - FINAL REPORT	
				NOTE THIS POST OPERATION MAY BE NOT PERFORMED AFTER LAUNCH SCRUB.	
				POST OPERATION INSTRUCTION 6 NOT PERFORMED	NA
05-025				ASSEMBLE FINAL REPORT BY ATTACHING FOLLOWING REPORTS TO THIS OMI. POST LAUNCH ASSESSMENT SRB ASSESSMENT LAUNCH FILM REVIEW LAUNCH DAY VIDEO REVIEW ORBITER LANDING ASSESSMENT ET SEPARATION REVIEW	
05-026				FINAL REPORT ASSEMBLY COMPLETE. ETM R. Seale DATE 5/10/01 OMRSD S00U00.011-1 USA VM 075	
05-027				ORBITER POST OPERATION INSTRUCTION 6 - FINAL REPORT COMPLETE.	

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POST OPERATION INSTRUCTIONS

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STS-98 LAUNCH DAY VIDEO REVIEW
KSC Photo/Video Analysis Team
7 February 2001

Significant Anomalies

None

Minor Anomalies

Tile surface coating pieces fell from orbiter base heat shield during engine startup; outboard of SSME #3 and inboard of SSME #2 (OTV 49, 70).

Ice from upper LOX feedline bellows falls and contacts lower orbiter surface (OTV 61). Further details of this event will be available after the film analysis.

Funnies

Two distinct flashes observed near the left side of vehicle approximately 3-4 seconds after SRB separation (TV 13). Further details of this event will be available after the film analysis.

Observations

SSME ignition appeared normal (OTV 51, 70). A considerable amount of free burning hydrogen was visible in the orbiter base heat shield area and rising to the RH OMS pod as well as the vertical tail before dissipating.

Numerous pieces of ice from the ET/ORB umbilical shook loose and contacted umbilical sill tiles and ET TPS, but no damage was detected (OTV 09, 63, 54).

LH2 and LO2 T-0 umbilical disconnect was normal (OTV 49, 50).

Numerous pieces of SRB throat plug were ejected from the exhaust holes without contacting the Orbiter (OTV 71, TV 4, 5, 7).

LH2 Aft Dome charring was observed (TV 13)

SRB slag was observed after SRB separation.

Numerous particles observed emanating from SRB plume area from T+1:09 thru T+1:24 (TV 4, 5).

Umbilical purge barrier baggie and RCS paper cover debris observed falling aft of vehicle (TV 4, 5)

Notes

Review of long range tracking films is scheduled to begin Friday morning, February 8, 2001.

Robert Speece
NASA – KSC

Jeff Stone
Boeing – Huntington Beach

Armando Oliu
NASA – KSC

Abdi Khodadoust
Boeing – Huntington Beach

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STEP 05-025 / APPENDIX K

STS-98 POST LAUNCH PAD DEBRIS INSPECTION REPORT
KSC Debris Team
08 February 2001

The post launch inspection of the MLP-2, Pad A FSS and RSS was conducted on 08 February 2001 from Launch + 12 to 14 hours. No flight hardware was found. The walkdown was delayed due to an IPR condition. This IPR was opened when bus 4A dropped out just after launch, resulting in the loss of four MLP HIMs.

Orbiter liftoff lateral acceleration data to predict stud hang-ups received from Boeing-Huntington Beach indicated that a hang-up had not occurred. No signs of stud hang-ups were detected in the visual inspection of the four south posts. Erosion was typical for the north posts. HDP-6 shoe shim material was debonded from the RH side. North holddown post blast covers and T-0 umbilical exhibited typical exhaust plume damage. Both SRB aft skirt GN2 purge lines were intact, protective tape layering was partially eroded.

The LO2 and LH2 Tail Service Masts (TSM) appeared undamaged and the bonnets were closed properly. The MLP deck was in generally good shape.

The GH2 vent line latched in the number eighth tooth of the latching mechanism. The GUCP 7-inch QD sealing surface exhibited no damage.

The OAA appeared to be intact with no evidence of plume impingement.
All slidewire baskets were secured with no evidence of damage.

The GOX vent arm, hood, ducts and structure appeared to be in good shape with no indications of plume damage.

Large pieces of roofing material came off from top of the power sub-station building just west of pad apron. This material impacted a trailer near the Pad causing major damage to the trailer.

Debris findings included:

- South Flame Trench
  - A broken bolt/nut/washer assy (3" x .75" diameter)
  - A Safety shower sign
  - An identification tag (dog tag)
  - A pipe clamp (2" dia)
- 115' Level
  - A metal spring 9" x 1 " diameter.
- No flight debris was found on the Pad apron.
- No unusual debris items were found on the FSS

Overall, damage to the FSS/RSS and MLP appeared to be minimal. Minimal debris was noted on pad apron and FSS.

Jorge Rivera NASA-KSC

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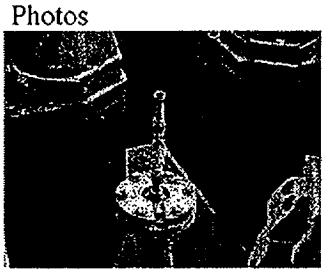
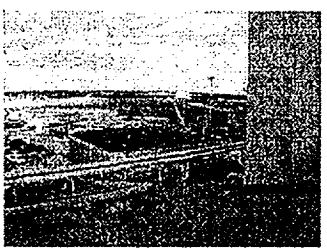
Photos





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STS-98 POST LAUNCH FILM REVIEW
KSC Photo/Video Analysis Team
09 February 2001

Significant Anomalies

None

Minor Anomalies

Tile surface coating material fell during engine startup from: a) orbiter base heat shield inboard of SSME #2 and outboard of SSME #3 (E-76, E-77); and b) body flap upper surface, outboard of SSME #2 (E-77).

Small ice particle from LO2 feedline bellows reported in the first-day video review (OTV-61) observed falling away from orbiter (E-40). Full view of the particle trajectory was obscured by facility backlighting, so orbiter contact was not verified.

Funnies

Two distinct flashes after SRB separation, as reported in the first-day video review, were not observed during film review (E-207, E-212).

Observations

GUCP disconnect from the ET was nominal (E-33, E-34). The small ice formation observed on the –Z side of the GUCP did not induce any TPS loss on the intertank.

Object observed falling from umbilical area towards the SRB (E-36). This object is most likely umbilical purge baggy material.

LH2 and LO2 T-0 disconnections were nominal.

Several flashes were observed in the SSME plume (E-52, E-207, E-222, E-224).

Free-burning GH2 observed rising towards orbiter base (E-52, E-63, E-76, E-77, E-222).

Numerous pieces of SRB throat plug and water trough material ejected from the SRB exhaust hole (E-52, E-63, E-222, E-224).

Particles of SRB aft-skirt instafoam fell along side the SRB plume (E-54, E-63, E-213, E-220, E-222, E-223).

Body flap and elevon movement during ascent were typical (E-31, E-223).

Facility debris observed passing through field of view well after the vehicle had cleared the tower (E-63, E-76, E-77).

Base heat shield movement during SSME ignition was typical (E-76).

Ice particles fell from ET/ORB umbilicals after lift-off.

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The forward RCS firing event prior to and during SRB separation has not been observed to-date. OMS-assist engine firing was visible (E-212).

Notes

Review of launch pad high-speed films is scheduled for Monday afternoon, February 12th.

Robert Speece
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Jeff Stone
Boeing – Huntington Beach

Abdi Khodadoust
Boeing – Huntington Beach

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STS-98 SRB POST FLIGHT/RETRIEVAL ASSESSMENT
KSC Debris Team
12 February 2001

The BI-105 Solid Rocket Boosters were inspected for debris damage and debris sources at CCAFS Hangar AF on 12 February 2001. Generally, both boosters were in excellent condition.

ANOMALIES

None

FUNNIES

The DCS Plunger was not fully seated on HDP No. 7. The plunger was prevented from seating properly by pieces of frangible nut.

OBSERVATIONS

The TPS on both frustums exhibited no debonds/unbonds. There was minor localized blistering of the Hypalon paint.

All eight BSM aero heat shield covers had fully opened and locked, but two LH cover attach rings had been bent at the hinge by parachute riser entanglement.

The forward skirts exhibited no debonds or missing TPS. The RSS antennae were intact.

The Field Joint Protection System (FJPS) and the System Tunnel Covers closeouts were generally in good condition with no unbonds observed.

Separation of the aft ET/SRB struts appeared normal.

Aft skirt external surface TPS was in good condition. Typical blistering of Hypalon paint had occurred on the BTA insulation close-outs and GEI cork runs.

The holddown post Debris Containment Systems (DCS) appeared to have functioned normally, except on HDP No. 7 which had some ordnance/nut fragments lodged in.
No indication of stud hang up was observed.

Jorge Rivera
NASA - KSC

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Subject: RE: STS-98 POST LAUNCH FILM REVIEW: DAY 1 REPORT

STS-98 POST LAUNCH FILM REVIEW
KSC Photo/Video Analysis Team
12 February 2001

SIGNIFICANT ANOMALIES

None.

MINOR ANOMALIES

E-207 was re-analyzed today with the following finding:

Prior to SRB separation, several pieces of debris were observed to pass (right-to-left) behind the left OMS nozzle. They were further observed to separate into multiple pieces outboard of the aft edge of the OMS. The precise source of the debris is currently unknown. There is no appearance of rigidity in these debris pieces.

Throat plug material expelled from the RHSRB exhaust hole and contacted orbiter lower surface tile just aft (approx. 8 feet) of LOX ET/ORB umbilical (E-5).

FUNNIES

None.

OBSERVATIONS

Free-burning GH2 was observed rising towards orbiter base during SSME startup.

Several ice particles fell from ET/ORB umbilical during SSME ignition, none of the particles contacted the vehicle.

Slag particles fell out of the SRB plume during tailoff.

SRB HPU exhaust was visible at T-0 and during liftoff (E-15, E-16).

Vapors on ET aft dome and SRB stiffener rings were observed after T-0.

Ice particles fell from LH2 / LO2 TSM T-0 disconnects.

No ordnance fragments fell from the DCS/stud hole in HDP #7 (E-11).

RCS paper covers from forward RCS observed moving downstream over the right wing (E-57).

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NOTES

All planned launch films have been reviewed at this time.

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STS-98 ORBITER POST LANDING INSPECTION
Debris Assessment
20 February 2001

A preliminary post landing inspection of OV-104 Atlantis was conducted at the Edwards Air Force Base Runway 22.

The Orbiter lower surface sustained 58 total hits, of which 8 had a major dimension of 1-inch or larger. The majority of the lower surface damage sites occurred in the umbilical area, indicative of impacts from umbilical ice and flapping baggie material during ascent. The area between the nose and main landing gear doors sustained hits that were evenly distributed between the right and left-hand sides of the Orbiter. This evenly distributed pattern is consistent with the patterns seen for recent flights where the ET intertank TPS has been vented. No unusual debris impact sites were observed.

The largest lower surface tile damage site, located just aft and outboard of the nose landing gear door, measured 2.5-inches long by 2-inches wide by 0.25-inch deep. Slight erosion was observed at this and an adjacent damage site. Imbedded in a third damage site in this area was a fibrous material believed to be Ames gap filler.

The OMS pods and vertical tail tiles appeared from ground level to have a typical amount of damage. The vertical tail leading edge damage site observed during on-orbit operations had not changed significantly. There were no missing tiles or blankets from the OMS pods or vertical tail that would explain the debris identified in film analysis to have occurred just prior to SRB separation.

An AFRSI blanket was slightly debonded and protruding from the area immediately aft of the up-firing jets in the forward RCS group.

The main landing gear tires were reported to be in good condition. There was no ply under cutting on the main landing gear tires

Tile damage on the base heat shield was typical. The SSME Dome Heat Shield closeout blankets were in good condition.

This is the first flight using the forward up-firing RCS jet plumes to help prevent BSM particulate impingement on the windows during SRB separation. Window hazing appeared to be less than normal. Streaks were observed on forward facing windows 3 and 4. The number of impact damage sites on the window perimeter tiles appeared to be less than usual in quantity and size.

A post landing walk-down of the runway was performed. No flight hardware was found. All components of the drag chute were recovered and appeared to have functioned normally. Both reefing and line cutter pyrotechnic devices were expended.

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The Orbiter post landing assessment will continue in the MDD after towing and safing operations have been completed.

J. S. Stone
Boeing/Huntington Beach

J. M. McClymonds
Boeing/Huntington Beach

A. Khodadoust
Boeing/Huntington Beach

ET 01

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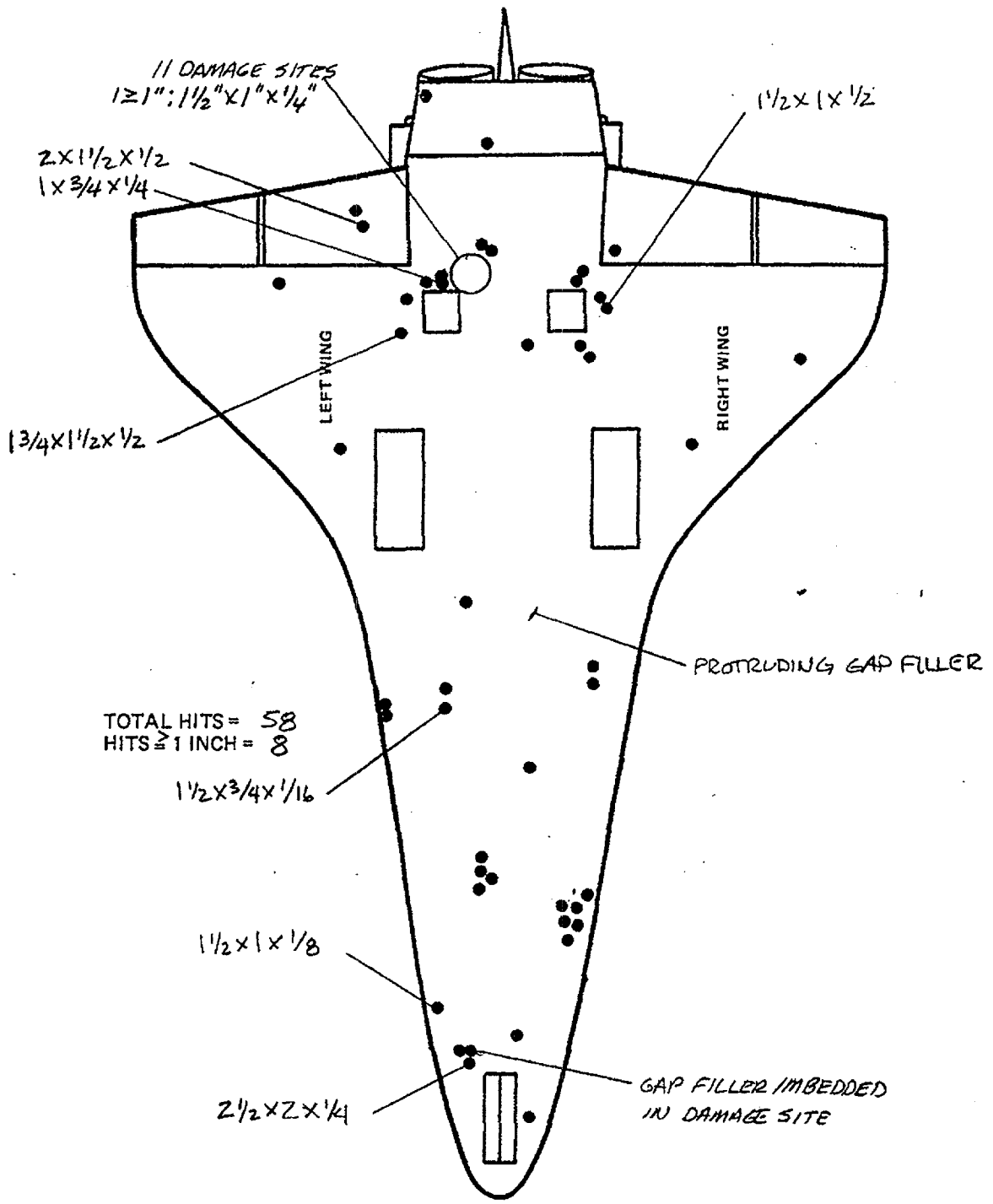
STS-98
DEBRIS DAMAGE LOCATIONS



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STS-98 ORBITER POST LANDING INSPECTION
Debris Assessment
21 February, 2001

After the 12:33 pm local time landing on 20 February, 2001, a preliminary post landing inspection of OV-104 Atlantis was conducted at the Edwards Air Force Base Runway 22. The final inspection was performed at the Mate Demate Device (MDD) on February 21, 2001.

The Orbiter TPS sustained a total of 102 hits of which 13 had a major dimension of one inch or larger. This total does not include the numerous hits on the base heat shield attributed to SSME vibration/acoustics and exhaust plume recirculation.

The following table lists the STS-98 Orbiter damage hits by area:

	HITS > 1-inch	TOTAL HITS
Lower Surface	8	73
Upper Surface	1	5
Window Area	3	18
Right Side	1	1
Left Side	0	3
Right OMS Pod	0	2
Left OMS Pod	0	0
TOTALS	13	102

The Orbiter lower surface sustained 73 total hits, of which 8 had a major dimension of one inch or larger. Approximately 24 damage sites (with three larger than one inch in a major dimension) were located in the area from the nose gear to the main landing gear wheel wells. The amount and size of damage in this region was less than average. ET intertank TPS venting modifications appear to continue to have a reducing effect on both the quantity and size of the damage sites.

Numerous damage sites around the LH2 ET/ORB umbilical were most likely caused by pieces of the umbilical purge barrier flapping in the airstream and contacting tiles before pulling loose and falling aft.

The largest lower surface tile damage site, located just aft and outboard of the nose landing gear door, measured 2.5 inches long by 2 inches wide by 0.25 inch deep. Slight erosion was observed at this and an adjacent damage site. Imbedded in a third damage site in this area was a fibrous material believed to be Ames gap filler.

The second largest hit was located on the lower surface of the left-hand inboard elevon, and measured 2 inches long by 1.5 inches wide by 0.5 inch deep. This damage site showed indications of thermal erosion.

Only two minor hits were observed on the left OMS pod. However, two adjoining edges of an AFRSI blanket near the leading edge of the left OMS pod were observed to be

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loose and frayed. There were no missing tiles or blankets from the OMS pods that would coincide with the debris observed near the OMS pod prior to SRB separation in film E-207.

There were no tiles or blankets missing from the vertical tail. The vertical tail leading edge damage site observed during on-orbit operations had not changed significantly (2 inches by 3 inches by 0.25 inch). This damage site appeared to have an impact residue embedded in it. It is planned to remove this residue for further analysis.

This is the first flight using the forward up-firing RCS jet plumes to help prevent BSM particulate impingement on the windows during SRB separation. Window hazing appeared to be less than normal. Streaks were observed on forward facing windows 3 and 4. The streaks are believed to be RTV adhesive used to bond the paper covers to the Orbiter RCS nozzle exits. It was also noted that an AFRSI blanket was slightly protruding from the area immediately aft of the up-firing jets in the forward RCS group.

A total of 18 impact damage sites on the window perimeter tiles were observed with three having a major dimension of one inch or greater. These damage sites are a result of impact by RCS paper covers with RTV adhesive on the back.

The landing gear tires were reported to be in good condition. There was no ply under cutting on the main landing gear tires.

No debris was found beneath the umbilicals after the umbilical doors were opened.

Tile damage on the base heat shield was typical. The SSME Dome Heat Shield closeout blankets were in excellent condition, except for the SSME number one closeout blanket which was torn at the seven-o'clock position.

A post landing walk-down of the runway was performed. No flight hardware was found. All components of the drag chute were recovered and appeared to have functioned normally. Both reefing and line cutter pyrotechnic devices were expended.

In summary, both the total number of Orbiter TPS debris hits (120) and the number of hits one inch or larger (13) were well within established family (family average 98 total hits and 16 one inch or greater). Potential identification of debris damage sources for mission STS-98 will be based on the laboratory analysis of Orbiter post landing microchemical samples, inspection of the recovered SRB components, film analysis and aerodynamic debris particle trajectory analysis. The results of these analyses will be documented in the STS-98 Debris/Ice/TPS assessment and the Integrated Photographic Analysis Report.

Jack. McClymonds
Boeing – Huntington Beach

Abdi Khodadoust
Boeing – Huntington Beach

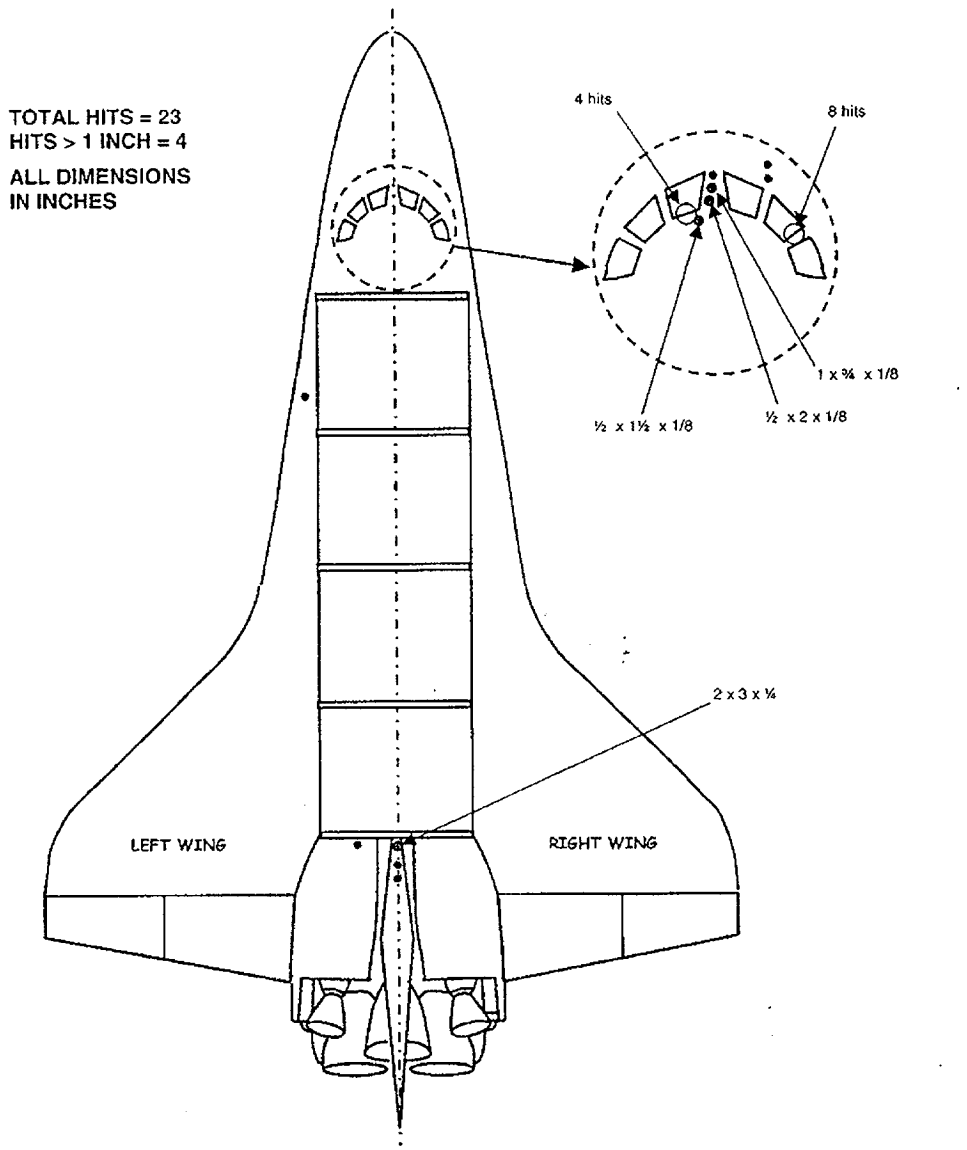
Jeff Stone
Boeing – Huntington Beach

ET 01

2/22/01

STEP 05-025

STS – 098
DEBRIS DAMAGE LOCATIONS



ET 01

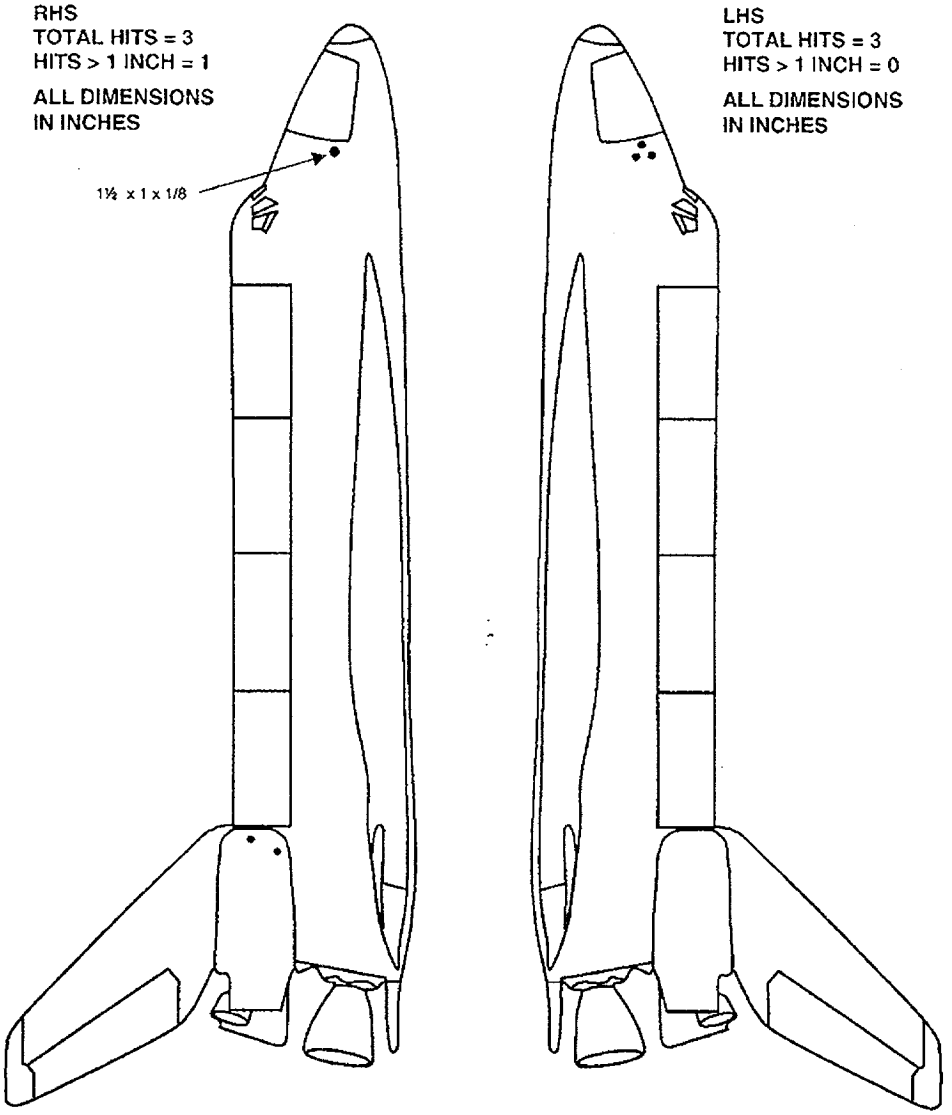
2/23/01

STEP 05-025

STS – 098
DEBRIS DAMAGE LOCATIONS

RHS
TOTAL HITS = 3
HITS > 1 INCH = 1

ALL DIMENSIONS
IN INCHES



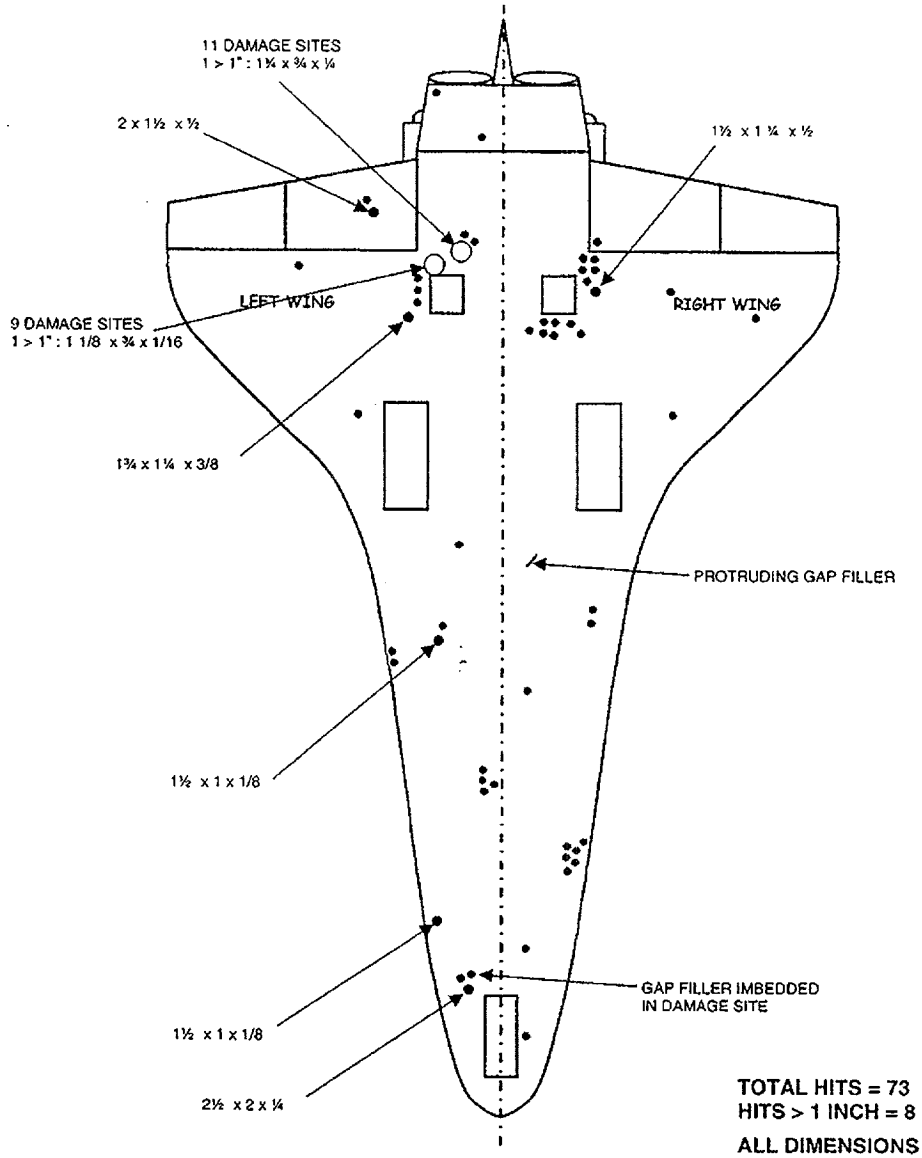
LHS
TOTAL HITS = 3
HITS > 1 INCH = 0

ALL DIMENSIONS
IN INCHES

ET
01
2/23/01

STEP 05-025

STS – 098
DEBRIS DAMAGE LOCATIONS



TOTAL HITS = 73
HITS > 1 INCH = 8

ALL DIMENSIONS
IN INCHES

ET
01
2/23/01

APPENDIX A

PHOTO REQUIREMENTS FOR SSV AND LAUNCH PAD CONFIGURATION

TABLE A-1 - PHOTOS FROM MLP

PHOTO	CAMERA ORIENTATION	LENS	NOTES
ET -Z	VERICAL	28 MM	
AFT DOME	HORIZONTAL	28 MM	
AFT DOME	HORIZONTAL	35-70 MM	
LH SRB FROM NORTH	HORIZONTAL	35-70 MM	ALL WEATHER TROUGHS IN VIEW
LH SRB FROM NORTH	VERTICAL	35-70 MM	3-4 WATER TROUGHS IN VIEW
LH SRB FROM EAST	VERTICAL	35-70 MM	
RH SRB FROM NORTH	HORIZONTAL	35-70 MM	ALL WATER TROUGHS IN VIEW
RH SRB FROM NORTH	VERTICAL	35-70 MM	3-4 WATER TROUGHS IN VIEW
RH SRB FROM WEST	VERTICAL	35-70 MM	
SRB HEATER ELEC T-0	HORIZONTAL	35-70 MM	FOAM INTRUSION; MAY NEED FLASH
NORTH HDP	VERTICAL	35-70 MM	REPRESENTATIVE VIEW
SOUTH HDP	VERTICAL	35-70 MM	REPRESENTATIVE VIEW
TSM T-0 LH2	VERTICAL	35-70 MM	FLASH NEEDED
TSM T-0 LO2	VERTICAL	35-70 MM	FLASH NEEDED
ORBITER LEFT & RIGHT WING	VERTICAL	35-70 MM	FROM BELOW ET (1 PHOTO EA WING)

APPENDIX A

TABLE A-2 - 135 FT LVL PHOTOS

PHOTO	CAMERA ORIENTATION	LENS	NOTES
LOX UMB	VERTICAL	35-70 MM	FROM OWP USUALLY DURING T5401
LH2 UMB	VERTICAL	35-70 MM	FROM OWP USUALLY DURING T5401

TABLE A-3 - 215 FT LVL PHOTOS

PHOTO	CAMERA ORIENTATION	LENS	NOTES
ET SURFACES FROM FSS	VERTICAL	35-70 MM	
LH SRB FRUSTRUM AND FWD SKIRT	VERTICAL	35-70 MM	
RH SRB FRUSTRUM AND FWD SKIRT	VERTICAL	35-70 MM	
JACK PAD C/O'S	HORIZONTAL	35-70 MM	FLASH NEEDED (1 EA C/O)
LO2 OGIVE CABLE TRAY	VERTICAL	35-70 MM	FROM RSS ROOF

APPENDIX A

TABLE A-4 - 255 FT LVL PHOTOS

PHOTO	CAMERA ORIENTATION	LENS	NOTES
ET SURFACES WITH GOX VENT DUCTS IN VIEW	VERTICAL	35-70 MM	
GOX VENT DUCTS	HORIZONTAL	250 MM	

APPENDIX A

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APPENDIX B

GROUP 1 CAMERA POSITIONS FOR TERMINAL COUNT

NOTE

THIS APPENDIX DEFINES GROUP 1 CAMERA POSITIONS FOR TERMINAL COUNTDOWN. CAMERAS SHOULD BE POSITIONED FOR IGNITION NO LATER THAN PICK-UP OF T-9 MINUTES COUNT. "SPOT" SCANNING AFTER PICK-UP OF THE T-9 MINUTE COUNT IS ACCEPTABLE WITH CICE CONCURRENCE.

CAMERAS MAY BE POSITIONED FOR SSME IGNITION NON-SEQUENTIALLY.

CAMERA POSITIONS MAY BE ALTERED REAL-TIME WITH CICE CONCURRENCE. ALTERATIONS SHOULD BE DETERMINED PRIOR TO PICK-UP OF T-9 MINUTE COUNT TO ALLOW SUFFICIENT TIME FOR OPERATORS TO REHEARSE CAMERA MOVEMENTS WITH ICE CONSOLE.

THE GOX VENT ARM (GVA) RETRACTS AT T-2M30S.

GROUP 1 CAMERA POSITIONS ARE DEFINED AS FOLLOWS:

004/104

GUCP CENTERED IN FRAME SO THAT GUCP WILL STAY IN VIEW THROUGHOUT SRB "TWANG".

042/142

AT APPROX T-1 HOUR, VIEW AND MONITOR ORBITER ACCESS ARM WHILE ORBITER HATCH IS BEING CLOSED.

AT T-7 MINUTES 30 SECONDS, WATCH ORBITER ACCESS ARM RETRACT, THEN VIEW BIPOD STRUT IN CENTER OF FRAME, LOX FEEDLINE FAIRING IN TOP OF FRAME, AND ORBITER HATCH IN RIGHT OF FRAME.

APPENDIX B

054/154

AT T-3 MINUTES 50 SECONDS, VIEW ORBITER RIGHT HAND BODY FLAP MOVEMENT, THEN ZOOM OUT WITH ORBITER/ET UMBILICALS AT APPROXIMATE FRAME CENTER, ORBITER TRAILING EDGE AT FRAME BOTTOM, AND EDGE OF +Y (RH) SRB JUST IN VIEW AT FRAME RIGHT.

013/113

AT T-2 MINUTES 30 SECONDS, WATCH LIFT OF GOX VENT ARM FOR DEBRIS AND NOSE CONE/VENT LOUVERS FOR ICE DAMAGE. IMMEDIATELY FOLLOWING LIFT OF GOX VENT ARM, CENTER FRAME ON GOX VENT LOUVER AND THEN ZOOM-OUT SO THAT ENTIRE ET MOVEMENT IS SEEN DURING SRB 'TWANG' AT SSME IGNITION.

060/160

AT APPROXIMATELY T-2 MINUTES 30 SECONDS, AFTER GOX VENT ARM RETRACTS, GO FULL ZOOM IN FOR A CLOSE-UP INSPECTION OF THE GOX VENT LOUVER. AFTER CICE CONCURRENCE, GO FULL ZOOM OUT AND POSITION CAMERA WITH SSV CENTERED AND ET NOSE CONE AT FRAME TOP.

062/162

AT APPROXIMATELY T-2 MINUTES 30 SECONDS, AFTER GOX VENT ARM RETRACTS, GO FULL ZOOM IN FOR A CLOSE-UP INSPECTION OF THE -Y GOX VENT LOUVER. AFTER CICE CONCURRENCE, ZOOM OUT UNTIL ET NOSE SPIKE IS AT TOP OF FRAME WITH ET CENTERED.

APPENDIX C

GROUP 2 CAMERA POSITIONS FOR TERMINAL COUNT

NOTE

THIS APPENDIX DEFINES GROUP 2 CAMERA POSITIONS FOR TERMINAL COUNTDOWN. CAMERAS SHOULD BE POSITIONED FOR IGNITION NO LATER THAN PICK-UP OF T-9 MINUTES COUNT. "SPOT" SCANNING AFTER PICK-UP OF THE T-9 MINUTE COUNT IS ACCEPTABLE WITH CICE CONCURRENCE.

THE ORBITER ACCESS ARM (OAA) RETRACTS AT T-7M30S. ORBITER BODY FLAP MOVEMENT OCCURS AT T-3M50S.

CAMERAS MAY BE POSITIONED FOR SSME IGNITION NON-SEQUENTIALLY

CAMERA POSITIONS MAY BE ALTERED REAL-TIME WITH CICE CONCURRENCE. ALTERATIONS SHOULD BE DETERMINED PRIOR TO PICK-UP OF T-9 MINUTE COUNT TO ALLOW SUFFICIENT TIME FOR OPERATORS TO REHEARSE CAMERA MOVEMENTS WITH ICE CONSOLE.

GROUP 2 CAMERA POSITIONS ARE DEFINED AS FOLLOWS:

033/133

FULL ZOOM OUT. LO2 FEED LINE IN FRAME CENTER AND MLP DECK AT BOTTOM.

055/155

VIEW ET AFT DOME WITH MLP DECK JUST OUT OF VIEW AT BOTTOM, ET XT-2058 RING FRAME AT FRAME TOP AND BOTH SRB'S JUST IN VIEW AT SIDES.

056/156

VIEW ET AFT DOME WITH MLP DECK JUST OUT OF VIEW AT BOTTOM. ET XT-2058 RING FRAME AT FRAME TOP AND BOTH SRB'S JUST IN VIEW AT SIDES.

065/165

FULL ZOOM OUT. SSV CENTERED. MLP DECK EDGE JUST IN VIEW AT BOTTOM.

APPENDIX C

066/166

ET CENTERED. INTERTANK TO LOX BRREL SPLICE AT FRAME TOP WITH THE MAJORITY OF ORBITER WING IN VIEW.

067/167

CENTER ON GUCP FOR OPTIMUM VIEW.

070/170 AND 071/171

AT T-9 MINUTES 00 SECONDS, ZOOM IN ON SPACE SHUTTLE MAIN ENGINE WITH CAMERA PROVIDING BEST VIEW. ZOOM OUT ON SSME FOR WIDE ANGLE VIEW WITH OTHER CAMERA.

061/161

AT APPROXIMATELY T-4 MINUTES 00 SECONDS, VERIFY CAMERA LIGHTS ARE OFF. THEN POSITION CAMERA TO VIEW ASTRONAUT CLOSING VISOR AT T-2 MINUTES 00 SECONDS.

009/109

AT APPROXIMATELY T-3 MINUTES 50 SECONDS, POSITION TO VIEW ORBITER BODY FLAP AND ELEVONS MOVEMENT. AFTERWARDS, CENTER ON LH2 UMBILICAL WITH -Y VERTICAL STRUT AT FRAME TOP.

061/161

AT APPROXIMATELY T-1 MINUTE 30 SECONDS, TILT-UP TO GOX VENT FOOTPRINT. ZOOM IN. PAUSE. IF FOOTPRINT IS ACCEPTABLE, ZOOM OUT AND TILT DOWN TO VIEW ORBITER NOSE/COCKPIT THRU LIFTOFF.

APPENDIX D

FINAL INSPECTION TEAM WALKDOWN STAY TIMES

0 LEVEL - 20 MINUTES

LH2 AFT DOME

ET ACREAGE AROUND +Z AXIS

ET ACREAGE AROUND -Z AXIS

LO2 FEED LINE

LH2 FEED LINE

ET/ORBITER ATTACHMENTS - BOTTOM VIEW

ET/ORBITER LH2 AND LO2 UMBILICALS

T-0 LH2 AND LO2 UMBILICALS

SPACE SHUTTLE MAIN ENGINES (SSME)

ORBITER TILES

ET/SRB AFT ATTACHMENTS

VISIBLE SRB SURFACES

SRB IGNITION OVERPRESSURE SOUND SUPPRESSION WATER TROUGHS

135 FT LEVEL - 10 MINUTES

LH2 ET/ORBITER UMBILICAL

-Y ET/SRB C/T

-Y VERTICAL STRUT

LO2 FEED LINE

ET ACREAGE BETWEEN -Y AXIS AND +Z AXIS

ET/ORBITER ATTACHMENTS - TOP VIEW

VISIBLE LH SRB SURFACES

ORBITER AFT FUSELAGE

APPENDIX D

195 FT LEVEL - 10 MINUTES

LO2 FEED LINE

ET/ORBITER BIPODS (SIDE AND BOTTOM VIEW)

-Y ET/SRB FORWARD ATTACHMENT (BOTTOM VIEW)

-Y ET/SRB AFT ATTACHMENTS (TOP VIEW)

INTER TANK SPLICE AREAS (LO2 AND LH2)

ET ACREAGE (BETWEEN -Y AND +Z AXIS)

ORBITER TILES

VISIBLE LH SRB SURFACES

215 FT LEVEL - 20 MINUTES

ET GH2 7 INCH VENT ASSEMBLY

ET ACREAGE (BETWEEN -Z AND -Y AXIS)

GOX VENT AREA

ORBITER TILES

TUMBLE VALVE CENTER

VISIBLE SRB SURFACES

INTER TANK-TO-LO2 BARREL SPLICE

APPENDIX D

255 FT LEVEL - 5 MINUTES

LO2 OGIVE AND BARREL ACREAGE

GO2 PRESSURIZATION LINE

LO2 TANK CABLE TRAY

VISIBLE LH SRB SURFACES

GOX VENT DUCTS

0 LEVEL - 25 MINUTES

CONDITIONS WHICH DIFFER FROM THOSE OBSERVED EARLIER

APPENDIX D

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APPENDIX E

DATA SHEET E-1 - FINAL INSPECTION TEAM - TELEPHOTOS

TABLE E-1 TELEPHOTOS - MLP

PHOTO	CAMERA ORIENTATION	NOTES
LH2 UMB	HORIZONTAL	FROM WEST
LH2 UMB	HORIZONTAL	FROM NW
EB-7	HORIZONTAL	
EB-8	HORIZONTAL	
LH2 AFT DOME	HORIZONTAL	
THIRD HARD POINT C/O	VERTICAL	
LH2 BARREL	HORIZONTAL	FROM NORTH
SSV OVERALL	HORIZONTAL	FROM NORTH
SSV OVERALL	HORIZONTAL	FROM EAST
LO2 F/L BRACKET AND BELLOWS	VERTICAL	XT-1973
LO2 F/L BRACKET	VERTICAL	XT-1871
LO2 F/L BRACKET	VERTICAL	XT-1623
LO2 F/L BRACKET	VERTICAL	XT-1377 & XT-1129
LO2 F/L BRACKET AND BELLOWS	VERTICAL	XT-1129 & XT-1106 FROM SE
LO2 P/L AND C/T	VERTICAL	FROM SE

APPENDIX E

TABLE E-2 TELEPHOTOS - 135 FT LVL

PHOTO	CAMERA ORIENTATION	NOTES
LH2 UMB	HORIZONTAL	
-Y LONGERON	VERTICAL	IF NEEDED
JACK PAD CLOSEOUTS	HORIZONTAL	
LH2 ACREAGE	VERTICAL	

TABLE E-3 TELEPHOTOS - 195 FT LVL

PHOTO	CAMERA ORIENTATION	NOTES
-Y BIPOD RAMP AND JACK PAD C/O	HORIZONTAL	

TABLE E-4 TELEPHOTOS - 215 FT LVL

PHOTO	CAMERA ORIENTATION	NOTES
-Y BIPOD RAMP	HORIZONTAL	FROM RSS
LO2 P/L ICE FROST RAMPS	VERTICAL	FROM RSS; REQUIRES 3-4 SHOTS
GOX SEAL/HOOD	HORIZONTAL	FROM HAUNCH AND RSS
GUCP	VERTICAL	

TABLE E-5 TELEPHOTOS - 255 FT LVL

PHOTO	CAMERA ORIENTATION	NOTES
GOX VENT DUCTS	HORIZONTAL	
LO2 ACREAGE	VERTICAL	

APPENDIX E

DATA SHEET E-2 - FINAL INSPECTION TEAM - 600 MM PHOTOS

TABLE E-6 600 MM PHOTOS - MLP

PHOTO	SHUTTER SPEED	NOTES
LH2 UMB	1/30	FROM WEST
LH2 UMB	1/30	FROM NW
LH2 UMB	1/30	FROM EAST
LH2 UMB ACTUATOR C/O	1/15 OR 1/30	FROM NORTH STANDING NEXT TO WATER PIPE
LO2 UMB	1/5	LOWER INBOARD
LO2 UMB	1/8	INBOARD
LO2 F/L BRACKET/BELLOWS	1/15	ONE PHOTO TO INCLUDE XT-1978 AND XT-1973
LO2 F/L BRACKET	1/15	XT-1871
LO2 F/L BRACKET	1/15	XT-1623
LO2 F/L BRACKET	1/15	XT-1377
LO2 F/L BRACKET	1/30	ONE PHOTO TO INCLUDE XT-1129 AND XT-1106
LO2 F/L BRACKET	1/30	FROM SE CORNER; ONE PHOTO TO INCLUDE XT-1129 AND XT-1106
JACK PAD C/O'S	1/15	FROM SE CORNER
ICE FROST RAMPS OR PAL RAMPS	1/15 OR 1/30	CONTINGENCY
LH2 UMB INBOARD	1/15	FROM EAST
+Y LONGERON	1/15 OR 1/30	CONTINGENCY
-Y LONGERON	1/15	CONTINGENCY

APPENDIX E

TABLE E-7 600 MM PHOTOS - 135 FT LVL

PHOTO	SHUTTER SPEED	NOTES
LH2 UMB	1/30	
-Y VERT STRUT (CRACK)	1/60	
LO2 F/L BELLOWS	1/15	CONTINGENCY

TABLE E-8 600 MM PHOTOS - 195 FT LVL

PHOTO	SHUTTER SPEED	NOTES
-Y BIPOD RAMP	1/30	CONTINGENCY

TABLE E-9 600 MM PHOTOS - 215 FT LVL

PHOTO	SHUTTER SPEED	NOTES
TUMBLE VALVE COVER	1/30	
-Y GOX SEAL	1/30	
-Y BIPOD RAMP	1/30	CONTINGENCY
JACK PAD C/O'S	1/4	DIFFICULT IF WINDY
LO2 F/L	1/15	
-Y VERT STRUT (CRACK)	1/30	

TABLE E-10 600 MM PHOTOS - 255 FT LVL

PHOTO	SHUTTER SPEED	NOTES
GOX VENT DUCTS	1/30	CONTINGENCY

APPENDIX E

DATA SHEET E-3 - FINAL INSPECTION TEAM - WIDE ANGLE PHOTOS

TABLE E-11 WIDE ANGLE PHOTOS - MLP

PHOTO	CAMERA ORIENTATION	LENS	NOTES
OVERALL ORBITER LEFT SIDE	VERTICAL	28 MM	
ET -Y, +Z QUADRANT	VERTICAL	28 MM	
ET -Z SIDE	VERTICAL	28 MM	
ET +Y, +Z QUADRANT	VERTICAL	28 MM	
OVERALL ORBITER RIGHT SIDE	VERTICAL	28 MM	
ET AFT DOME	HORIZONTAL	35-70 MM	
-Z SIDE OF LO2 T-0; RCS STINGER	HORIZONTAL	35-70 MM	
+Z SIDE OF LO2 T-0; RCS STINGER OMS NOZZLE	HORIZONTAL	35-70 MM	
-Z SIDE OF LH2 T-0; RCS STINGER	HORIZONTAL	35-70 MM	
+Z SIDE OF LH2 T-0; RCS STINGER OMS NOZZLE	HORIZONTAL	35-70 MM	
OVERALL SSME CLUSTER	HORIZONTAL	50 MM	-Y SIDE
SSME NO. 2	HORIZONTAL	50 MM	
SSME NO. 1, -Z SIDE	HORIZONTAL	50 MM	
SSME NO. 3	HORIZONTAL	50 MM	

MAY 15 '01

OVERALL SSME CLUSTER	HORIZONTAL	50 MM	+Y SIDE
LO2 UMB AREA	HORIZONTAL	35-70 MM	
LH2 UMB AREA	HORIZONTAL	35-70 MM	
ET/ORB UMB AND ORB LOWER SURFACE	HORIZONTAL	28 MM	FROM UNDER ET

TABLE E-12 WIDE ANGLE PHOTOS - 135 FT LVL

PHOTO	CAMERA ORIENTATION	LENS	NOTES
ORBITER AFT SECTION	VERTICAL	35-70 MM	
LOWER LH2 TANK AND LH SRB	VERTICAL	35-70 MM	

TABLE E-13 WIDE ANGLE PHOTOS - 195 FT LVL

PHOTO	CAMERA ORIENTATION	LENS	NOTES
AFT PART OF SSV, LH WING	VERTICAL	35-70 MM	
ORBITER FWD SECTION, UPPER LH2 TANK	VERTICAL	35-70 MM	
BIPOD, -Y, +Z INTER TANK AREA	HORIZONTAL	35-70 MM	

APPENDIX E

TABLE E-14 WIDE ANGLE PHOTOS - 215 FT LVL

PHOTO	CAMERA ORIENTATION	LENS	NOTES
OVERALL GH2 VENT LINE	HORIZONTAL	35-70 MM	
ORBITER NOSE, ET -Y SIDE	HORIZONTAL	35-70 MM	
ORBITER NOSE, ET -Y, +Z SIDE	HORIZONTAL	35-70 MM	FROM RSS
FWD HALF OF VEHICLE	VERTICAL	28 MM	FROM RSS
ENTIRE ORBITER	VERTICAL	28 MM	FROM RSS

TABLE E-15 WIDE ANGLE PHOTOS - 255 FT LVL

PHOTO	CAMERA ORIENTATION	LENS	NOTES
LO2 TANK	VERTICAL	35-70 MM	
GOX VENT DUCTS	HORIZONTAL	35-70 MM	

APPENDIX E

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APPENDIX F

REDUCED FINAL INSPECTION TEAM PHOTOS

TABLE F-1 MLP DECK

PHOTO	LENS	CAMERA ORIENTATION	NOTES
LH2 UMB	TELE	HORIZONTAL	FROM WEST
ET AFT DOME	TELE	HORIZONTAL	
THIRD HARD POINT	TELE	VERTICAL	
LH2 TANK	TELE	HORIZONTAL	FROM NORTH
LO2 TANK	TELE	HORIZONTAL	FROM NORTH
LO2 TANK	TELE	HORIZONTAL	FROM EAST
LO2 F/L BRACKET BELLOWS	TELE	HORIZONTAL	XT-1978 AND XT-1973
LO2 F/L BRACKET	TELE	HORIZONTAL	XT-1871
LO2 F/L BRACKET	TELE	HORIZONTAL	XT-1623
LO2 F/L BRACKETS	TELE	HORIZONTAL	XT-1377 AND XT-1129
LO2 F/L BRACKETS AND BELLOWS	TELE	HORIZONTAL	XT-1129 AND XT-1108; FROM SE
LO2 P/L AND C/T	TELE	HORIZONTAL	FROM SE
OVERALL ORBITER LEFT SIDE	28 MM	VERTICAL	
ET -Z SIDE	28 MM	VERTICAL	
OVERALL ORBITER RIGHT SIDE	28 MM	VERTICAL	
OVERALL SSME CLUSTER -Y SIDE	28 MM	HORIZONTAL	
OVERALL SSME CLUSTER +Y SIDE	28 MM	HORIZONTAL	

ET/ORB UMB & ORBITER LOWER SURFACE	28MM	HORIZONTAL	FROM UNDER ET

TABLE F-2 135 FT LVL - WIDE ANGLE & TELEPHOTO PHOTOGRAPHY

PHOTO	LENS	CAMERA ORIENTATION	NOTES
LH2 UMB	TELE	HORIZONTAL	
ORBITER AFT SECTION	35-70 MM	VERTICAL	

TABLE F-3 195 FT LVL - WIDE ANGLE & TELEPHOTO PHOTOGRAPHY

PHOTO	LENS	CAMERA ORIENTATION	NOTES
-Y BIPOD RAMP AND JACK PAD C/O'S	TELE	HORIZONTAL	

TABLE F-4 215 FT LVL - WIDE ANGLE & TELEPHOTO PHOTOGRAPHY

PHOTO	LENS	CAMERA ORIENTATION	NOTES
-Y BIPOD RAMP	TELE	HORIZONTAL	FROM RSS
LO2 P/L	TELE	VERTICAL	FROM RSS;
ICE/FROST RAMPS			2 PHOTOS REQ'D
GOX SEAL/HOOD	TELE	HORIZONTAL	FROM RSS
GUCP	TELE	VERTICAL	
FWD HALF OF SSV	28 MM	VERTICAL	FROM RSS
ENTIRE ORBITER	28 MM	VERTICAL	FROM RSS

TABLE F-5 255 FT LVL - WIDE ANGLE & TELEPHOTO PHOTOGRAPHY

PHOTO	LENS	CAMERA ORIENTATION	NOTES
GOX VENT DUCTS	TELE	HORIZONTAL	

APPENDIX G

OBSERVATION DOCUMENTATION PROCEDURE

1. CTIF CVM1 222 CVM2 — LOCATE ANOMALY/CONCERN ON PERTINENT OTV('S)

2. CTIF — PUNCH-UP PERTINENT OTV ON TROUBLE MONITOR. UPDATE TROUBLE TAPE LOG IN TABLE BELOW.

3. CTIF — START THE TROUBLE TAPE.

NOTE

TROUBLE TAPE SHALL BE ALLOWED TO RUN UNTIL SUFFICIENT OTV DOCUMENTATION OF OBSERVATION/ CONCERN HAS BEEN MADE. OK TO CHANGE OTV'S WHILE TROUBLE TAPE IS RUNNING.

4. CTIF — AFTER OBSERVATION/CONCERN HAS BEEN DOCUMENTED ON THE TROUBLE TAPE, STOP THE TROUBLE TAPE. UPDATE TROUBLE TAPE LOG IN FOLLOWING TABLE.

TABLE G-1 TROUBLE TAPE LOG

TROUBLE TAPE NO.	START TIME (GMT)	STOP TIME (GMT)	OTV	DESCRIPTION
1	(SEE "TROUBLE TAPE RECORDING LOG STS-98 S0007 LAUNCH DATE: 02-07-01" INSERT)			
			R. Seale ET 2/7/01	

ET 01

2/7/01

APPENDIX G

N/A

ET
01
2/7/01

APPENDIX G

N/A

ET
01
2/7/01

TROUBLE TAPE RECORDING LOG
STS-98 S0007 LAUNCH
DATE: 02-07-01

TAPE NO.	CAM. NO.	START TIME (GMT)	STOP TIME (GMT)	DESCRIPTION OF ANOMALY/CONDITION
1	054	14:17	14:19	LO2 F/L Scan
1	055	15:21	15:19	Possible Frost on LH2 Barrel
1	054	15:20	15:22	LO2 F/L Scan
1	054	16:20	16:21	LO2 F/L scan
1	054	17:28	19:26	LO2 F/L SCAN / MINOR ICE BUILD UP AROUND BKTS.
1	054	18:15	18:16	LO2 F/L SCAN
1	054	19:33	19:34	LO2 F/L SCAN
1	067	19:44	19:45	Frost on GUCA ARM
1	054	20:18	20:20	LO2 F/L SCAN
1	067	21:25	21:27	ICE/FROST ON GUCP LEGS
1	054	21:36	21:39	LO2 F/L SCAN
1	054	2216	22:17	" " "

NASA SELECT LAUNCH VIEWS

APPENDIX C
TABLE C-1

Notes:

ET 106
ORB 104
SRB BI105
MLP 2
PAD A

1 of 2 ET 01

DATE: 04-22-00

OMI NO. - S6444
REV. - I

APPENDIX H

OBSERVATION SHEET

DATA SHEET H-1 - OBSERVATION DOCUMENTATION

RECORD FOLLOWING INFORMATION FOR CONDITION OBSERVED:

OBSERVATION NO. 01

OBSERVED BY J. RIVERA

DATE 02-07-01 TIME 21:14:27 GMT

CAMERA NO. (OR WALKDOWN) 67

DESCRIPTION:

MORE THAN NORMAL ICE FORMATION ON GUCP LEGS. ICE FORMED AT TOP OF I/T STRINGER

ACCEPTANCE RATIONALE (OR IPR/PR NO.):

ACCEPTABLE PER ABTS08303 REF. PHOTO 5.3.2

CICE [signature] PHH2 DATE 02-07-01

CTIF [signature] DATE 02-07-01

ET 01

2/7/01

109

DATE: 04-22-00

APPENDIX H

OBSERVATION SHEET

DATA SHEET H-1 - OBSERVATION SHEET

RECORD FOLLOWING INFORMATION FOR CONDITION OBSERVED:

OBSERVATION NO._____

OBSERVED BY_____

DATE_____ TIME_____GMT

CAMERA NO.(OR WALKDOWN)_____

DESCRIPTION:

_____

_____

_____

_____

N/A

ACCEPTANCE RATIONALE (OR IPR/PR NO.):

_____

_____

_____

_____

CICE_____ DATE_____

CTIF_____ DATE_____

ET 01

2/15/01

APPENDIX H

OBSERVATION SHEET

DATA SHEET H-1 - OBSERVATION DOCUMENTATION

RECORD FOLLOWING INFORMATION FOR CONDITION OBSERVED:

OBSERVATION NO._____

OBSERVED BY_____

DATE_____ TIME_____GMT

CAMERA NO.(OR WALKDOWN)_____

DESCRIPTION:

_____

_____

_____

N/A

ACCEPTANCE RATIONALE (OR IPR/PR NO.):

_____

_____

_____

_____

CICE_____ DATE_____

CTIF_____ DATE_____

ET 01

2/15/01

DATE: 04-22-00

APPENDIX H

OBSERVATION SHEET

DATA SHEET H-1 - OBSERVATION DOCUMENTATION

RECORD FOLLOWING INFORMATION FOR CONDITION OBSERVED:

OBSERVATION NO._____

OBSERVED BY_____

DATE_____ TIME_____GMT

CAMERA NO.(OR WALKDOWN)_____

DESCRIPTION:

_____

_____

N/A

_____

ACCEPTANCE RATIONALE (OR IPR/PR NO.):

_____

_____

_____

_____

CICE_____ DATE_____

CTIF_____ DATE_____

ET 01
2/15/01

APPENDIX H

OBSERVATION SHEET

DATA SHEET H-1 - OBSERVATION DOCUMENTATION

RECORD FOLLOWING INFORMATION FOR CONDITION OBSERVED:

OBSERVATION NO._____

OBSERVED BY_____

DATE_____ TIME_____GMT

CAMERA NO. (OR WALKDOWN)_____

DESCRIPTION:

_____

_____

_____ N/A

_____

ACCEPTANCE RATIONALE (OR IPR/PR NO.):

_____

_____

_____

_____

CICE_____ DATE_____

CTIF_____ DATE_____

ET 01
2/15/01

DATE: 04-22-00

OMI NO. - S6444
REV. - I

APPENDIX H

OBSERVATION SHEET

DATA SHEET H-1 - OBSERVATION DOCUMENTATION

RECORD FOLLOWING INFORMATION FOR CONDITION OBSERVED:

OBSERVATION NO._____

OBSERVED BY_____

DATE_____ TIME_____GMT

CAMERA NO.(OR WALKDOWN)_____

DESCRIPTION:

N/A

ACCEPTANCE RATIONALE (OR IPR/PR NO.):

CICE_____ DATE_____

CTIF_____ DATE_____

ET 01

2/15/01

DATE: 04-22-00

OMI NO. - S6444
REV. - I

APPENDIX K

POST LAUNCH WALKDOWN INSPECTION AREAS

RECORD MISSION INFO, PAD, DATE, AND TIME:

STS- 098 PAD A

DATE 2/8/01 TIME 12 DO TO 1400E

SRB HOLD-DOWN-POSTS (HDP)

INSPECT FOR DAMAGE, STUD HANG-UP EPON SHIM MATERIAL, ORDNANCE FRAGMENTS, DOGHOUSE BLAST COVERS, EROSION, MISSING HARDWARE, DEBRIS. RECORD RESULTS.

(SEE INSERT AT STEP 05-025)

D. Seale ETm 2/8/01

MLP DECK

SRB AFT SKIRT PURGE LINES
SRB T-0 UMBILICALS
TAIL SERVICE MASTS (TSM'S)
MLP DECK

195 FT LEVEL

ORBITER ACCESS ARM (OAA)

ET 01

2/8/01

APPENDIX K

215 FT LEVEL - GH2 VENT LINE/GUCP

LATCH POSITION
LOOSE CABLES
DAMAGE FROM SRB PLUME
DAMAGE TO THE QD

255 FT LEVEL - GOX VENT ARM, DUCTS, HOOD

SEALS
HOOD WINDOWS, DOORS, LATCHES

FIXED SERVICE STRUCTURE (FSS)

CABLE TRAY COVERS
SIGNS
HYDRAULIC LEAKS
SLIDEWIRE BASKETS

PAD APRON/ACREAGE

VEHICLE HARDWARE AND/OR FLIGHT TPS MATERIALS
FACILITY DEBRIS

TABLE K-1 PAD APRON/ACREAGE ITEMS

DESCRIPTION	LOCATION
N/A	

ET 01

2/8/01

APPENDIX L

POST LAUNCH PHOTOS (MLP, FSS, PAD APRON, PAD ACREAGE)

MLP 0-LEVEL

1 EA HDP NO. 1, 2, 5 & 6 (HDP SHOE AND EPON SHIM)

1 EA HDP NO. 3, 4, 7 & 8 (BLAST COVER DOWN TO HDP BASE)

1 EA SRB T-O UMBILICAL

1 EA OVERALL VIEW SRB EXHAUST CUTOUTS

ANY UNUSUAL OR DEBRIS-RELATED DAMAGE TO THE FACILITY; SOUND SUPPRESSION WATER PIPES, TSM'S CRACKS IN MLP DECK, WITNESS PANELS, HANDRAILS, ETC.

ANY FLIGHT HARDWARE DEBRIS (TILES, SRB ORDNANCE FRAGMENTS)

ANY FACILITY DEBRIS (NUTS, BOLTS, CABLE TRAY COVERS, ETC.)

FSS

CLOSE-UPS OF GUCP AND LATCHING MECHANISM

OVERALL VIEWS OF GOX VENT HOOD/DUCTS - IF DAMAGED

ANY FLIGHT HARDWARE OR FACILITY DEBRIS

ANY UNUSUAL OR DEBRIS-RELATED DAMAGE TO THE FACILITY

PAD APRON/PAD ACREAGE

ANY FLIGHT HARDWARE OR UNUSUAL FACILITY DEBRIS OBJECTS

ANY UNUSUAL OR DEBRIS-RELATED DAMAGE TO THE PAD (SUCH AS MISSING BRICK IN THE FLAME TRENCH), PERIMETER FENCE, ETC.

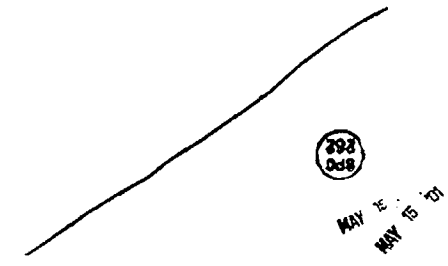
APPENDIX L

THIS PAGE INTENTIONALLY BLANK

END OF OMI

IPR STRIP

```
*************************************************
*                                               *
*        PROGRAM PRA120 SELECTION CRITERIA      *
* --------------------------------------------- *
*                                               *
*        RPT TYPE: IPR                          *
*                                               *
*        PR GROUP:                              *
*                                               *
*    WORK AREA CD:                              *
*                                               *
*      PR ELEM CD:                              *
*                                               *
*          STS NO:                              *
*                                               *
* Starting RPT DT: 02/06/01                     *
*                                               *
*   Ending RPT DT: 05/15/01                     *
*                                               *
*  LRU or Non-LRU: B                            *
*                                               *
*    PRACA EFF CD:                              *
*                                               *
*           EICN:                               *
*                                               *
*      RPT STATUS: OP                           *
*                                               *
* DETECTED DURING: S6444                        *
*                                               *
* --------------------------------------------- *
* Sorted by DETECTED DURING, PR ELEM CD, and EICN *
*                                               *
*************************************************
```



****
*
* NO DATA FOUND ON THE DATABASE FOR THE SELECTED PARAMETERS *
*
****

****
*
* END OF REPORT *
*

DEVIATION INDEX
(PERMANENT)

DEVIATION INDEX

WAD NO.

☒ PERMANENT ☐ TEMPORARY ☐ TEMP RECYCLE

S6444 REV: I CHG: (OMI)

DATE/TIME: 10/05/2000 13:33:27

TASK NO./SEQ. NO. 03

DEV NO.	SEQ/ STEP	EFFECTIVITY	QC/ PP&C	DATE	REMARKS
03-01	03 001			2000-10-04	

SPC 262

MAY 15 '01

KSC FORM 4-470 (C/G 07/93)

United Space Alliance

TOP/WAD Deviation

Dev No. 03/01	DILS No. 81522	Page 1 of 2

TOP/WAD No.	REV/CHG/VER		Cause Code Org (B,D,E,G,H,L,N,O,P,Q,S,T,V)	Cause Code Reason 10-Tech Chg 20-Proc Chg 30-Auth Error 40-Rewrite
S6444	I	☐ In Family ☒ Out of Family	E	10

First Use ☐ SRB BI- ☒ ET 104 ☐ GSE ☐ STS-

Effectivity: ☐ ORB /FLT ☐ FRCS/POD /FLT ☐ SSME /FLT

Affected: ☐ OMRS/ACOMC/OMP ☐ Design Req'ts ☐ Haz Step(s) ☐ PPE ☒ Internal Review Req.

Contractor OPR	Contractor Test Conductor	Gov't OPR
[signature] ETM 10/4/00		[signature] P.H.-K.Z. 10-04-00
Contractor Test Project Engineer	**Other** SE Check	**Gov't Project Engineer**
[signature] 10/4/00	R Brewer 10-04-00	
Contractor Safety	**Other**	**Gov't Test Director or Contractor Chief TC**

Change the following:

TP 02

Page Number: 41 First paragraph of second Note 03-001 OCT 04 2000
Page Number: 42 Step Number: 03-002

was: "... 063/163 and 064/164"

now: "... 063/163, 064/164, 068/168, and 069/169"

Page Number: 42 Step Number: 03-004

Add following Note and Step prior to 03-004:

> **NOTE**
> OTV Cameras 068/168 and 069/169 view the SW and NE GOX Vent areas respectively. These are fixed FOV cameras and do not have pan, tilt, etc. capability.

03-003.1 From start of LO2 Chill Down until GVA rotation eliminates the ET from the FOV, monitor SW and NE GOX Vent areas using cameras 068/168 and 069/169.

ETM: _____ ME 10 Date: 2/7/01

Originator (print)	SPDMS ID	Phone	Organization	Date	
R. Seale	T08011	1-3348	5391	10/4/00	☒ Perm ☐ Temp ☐ Temp-Recycle

USA FORM 4-30A

ET 01

2/7/01

United Space Alliance

TOP/WAD Deviation

Dev No. 03/01	DILS No. 11522	Page 2 of 2

TOP/WAD No.	REV/CHG/VER		Cause Code Org (B,D,E,G,H,L,N,O,P,Q,S,T,V)	Cause Code Reason 10-Tech Chg 20-Proc Chg 30-Auth Error 40-Rewrite
S6444	I	☐ In Family ☒ Out of Family	E	10

First Use ☐ SRB BI- ☒ ET 104 ☐ GSE ☐ STS-

Effectivity: ☐ ORB /FLT ☐ FRCS/POD /FLT ☐ SSME /FLT

Affected: ☐ OMRS/ACOMC/OMP ☐ Design Req'ts ☐ Haz Step(s) ☐ PPE ☒ Internal Review Req.

Contractor OPR	Contractor Test Conductor	Gov't OPR
R. Seale ETM 10/4/00		10-04-00
Contractor Test Project Engineer	**Other** SECHECK R. Brewer 10-04-00	**Gov't Project Engineer**
M.R. Hunter 10/4/00		
Contractor Safety	**Other**	**Gov't Test Director or Contractor Chief TC**

Page Number: 45 Step Number: 03-012

Add following Note and Step after 03-012:

NOTE

OTV Cameras 068/168 and 069/169 lights must be Off as the GVA rotates to its rest position to avoid shining into the Orbiter cockpit.

03-012.1 CVM1 JTV1 223

Immediately after GOX Vent Hood lift, turn camera 068/168 and 069/169 lights Off. After the GVA comes to its rest position, turn camera 068/168 and 069/169 lights On.

ETM _____ ME 10 Date 2/7/01

Not Performed N/A

Reason: Incorporate use of new OTV Cameras on the GOX Vent Hood for viewing ET GOX venting and GOX Vent Seal interfaces.

Originator (print)	SPDMS ID	Phone	Organization	Date	☒ Perm ☐ Temp ☐ Temp-Recycle
R. Seale	T08011	1-3348	5391	10/4/00	

USA FORM 4-30A

ET 01

2/7/01

DEVIATION INDEX
(TEMPORARY)

PEN & INK CHANGE

USA
United Space Alliance

Pen and Ink Change Record

NO./REVISION | EFFECTIVITY

PAGE	SEQ/OP-STEP	CHANGE	APPROVAL QE/ENG.