SSP 50481
Revision B

Management Plan for Waste Collection and Disposal

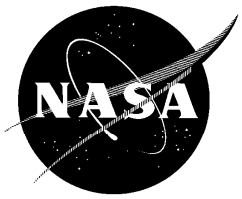
International Space Station Program

Revision B

August 2005

POCKOCMOC

National Aeronautics and Space Administration
International Space Station Program
Johnson Space Center
Houston, Texas



REVISION AND HISTORY PAGE

REV.	DESCRIPTION	PUB. DATE
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INTERNATIONAL SPACE STATION PROGRAM

MANAGEMENT PLAN FOR WASTE COLLECTION AND DISPOSAL

CHANGE SHEET

August 26, 2005

Revision B

Space Station Control Board Directive 008828/(1-1), dated 08-23-05. (1)

CHANGE INSTRUCTIONS

SSP 50481, Management Plan for Waste Collection and Disposal, has been approved by the authority of SSCD 008828. All future updates to this document will be identified on this change sheet.

SSP 50481
Revision B

INTERNATIONAL SPACE STATION PROGRAM

MANAGEMENT PLAN FOR WASTE COLLECTION AND DISPOSAL

Revision B (Reference SSCD 008828, dated 08-23-05)

LIST OF EFFECTIVE PAGES

August 26, 2005

The current status of all pages in this document is as shown below:

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i - ix	Revision B	008828	August 23, 2005
1-1	Revision B	008828	August 23, 2005
2-1 - 2-4	Revision B	008828	August 23, 2005
3-1 - 3-3	Revision B	008828	August 23, 2005
4-1 - 4-4	Revision B	008828	August 23, 2005
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SSP 50481
Revision B

INTERNATIONAL SPACE STATION PROGRAM

MANAGEMENT PLAN FOR WASTE COLLECTION AND DISPOSAL

AUGUST 2005

MIOCB APPROVAL NOTICE

INTERNATIONAL SPACE STATION PROGRAM

MANAGEMENT PLAN FOR WASTE COLLECTION AND DISPOSAL

AUGUST 2005

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Mission Integration and Operations
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INTERNATIONAL SPACE STATION PROGRAM

MANAGEMENT PLAN FOR WASTE COLLECTION AND DISPOSAL

AUGUST 2005

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MANAGEMENT PLAN FOR WASTE COLLECTION AND DISPOSAL

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INTERNATIONAL SPACE STATION PROGRAM

MANAGEMENT PLAN FOR WASTE COLLECTION AND DISPOSAL

AUGUST 2005

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INTERNATIONAL SPACE STATION PROGRAM

MANAGEMENT PLAN FOR WASTE COLLECTION AND DISPOSAL

LIST OF CHANGES

AUGUST 2005

All changes to paragraphs, tables, and figures in this document are shown below:

MIOCB	Entry Date	Change	Paragraph(s)
	August 2001	Baseline	All
	August 2003	DCN 001	
	July 2004	Revision A	All
	August 2005	Revision B	All

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TABLE

FIGURE

1.0 INTRODUCTION

1.1 PURPOSE

This document provides a source for constraints, groundrules, International Partner (IP) agreements, and top-level planning applicable to waste management for the entire International Space Station (ISS).

The ISS Program provides accommodations and capabilities for the pre-flight planning, on-orbit operations, and disposal of waste in order to ensure the safety and health of both flight crew and ground operations personnel.

1.2 SCOPE

ISS planning products for waste management will be derived from the contents herein.

1.3 PRECEDENCE

If there are any discrepancies between the information contained in this document and ISS requirements as defined in SSP 50261-01, Generic Groundrules, Requirements, and Constraints Part 1: Strategic and Tactical Planning, and SSP 5410X, Increment Definition and Requirements Document for Planning Period X, those documents take precedence.

1.4 DELEGATION OF AUTHORITY

This document is the responsibility of the Mission Integration and Operations Control Board (MIOCB) and is subject to the ISS Program change control process. This process is defined in SSP 41170, Configuration Management Requirements.

1.5 WAIVER/DEVIATION

The instructions for waiver/deviation are contained in SSP 41170, Sections 3.4.1.7 and 3.4.3.

1.6 ISSUES AND OPEN WORK

Open work is identified by a **<TBD X-X>** in the text. Unresolved issues are identified by a **<TBR X-X>** in the text. Appendix C, Table C-1, captures all of the To Be Determined (TBD) and Table C-2 captures all the To Be Resolved (TBR) items associated with this document. Once the TBD or TBR information is defined and approved, the correct text is inserted in place of the TBD or TBR in the document.

2.0 DOCUMENTS

2.1 APPLICABLE DOCUMENTS

The following documents include specifications, models, standards, guidelines, handbooks, and other special publications. The documents listed in this paragraph are applicable to the extent specified herein. Inclusion of applicable documents herein does not in any way supersede the order of precedence identified in Paragraph 1.3 of this document.

SSP 30599	Safety Review Process
SSP 41170	Configuration Management Requirements
SSP 50146	NASA/RSA Bilateral S&MA Process Requirements for ISS, Attachment D - NASA/ROSAVIAKOSMOS General Principles and Requirements for ISS Cargo Safety
SSP 50200-01	Station Program Implementation Plan, Volume 1: Station Program Management Plan
SSP 50200-02	Station Program Implementation Plan, Volume 2: Program Planning and Manifesting
SSP 50200-03	Station Program Implementation Plan, Volume 3: Cargo Analytical Integration
SSP 50254	Operations Nomenclature
SSP 50261-01	Generic Groundrules, Requirements, and Constraints Part 1: Strategic and Tactical Planning
SSP 50467	ISS Cargo Stowage Technical Handbook: Pressurized Volume
SSP 5410X	Increment Definition and Requirements Document for Planning Period X
SSP 5410X-XX	Increment Definition and Requirements Document for Planning Period X, Annex 1: Station Manifest (Series of Annexes of Flight-Specific Station Manifests)
NSTS/ISS 13830	Payload Safety Review and Data Submittal Requirements for Payloads Using the: -Space Shuttle -International Space Station

JSC 26895	Guidelines for Assessing the Toxic Hazard of Spacecraft Chemicals and Test Materials
JSC 27260	Decal Process Document and Catalog
JSC 36301	International Space Station Crew Training Catalog
JSC Form 44	Ionizing Radiation Source Data Sheet - Space Flight Hardware and Applications
KHB 1700.7	Space Shuttle Payload Ground Safety Handbook
SSPIA 039	Memorandum of Agreement Between International Space Station Program and Space Shuttle Program
П32928-103	Requirements for International Partner Cargo Transported on Russian Progress and Soyuz Vehicles.

2.2 REFERENCE DOCUMENTS

The following documents contain supplemental information to guide the user in the application of this document. These reference documents may or may not be specifically cited within the text of this document.

SSP 30233	Space Station Requirements for Materials and Processes
SSP 30575	Space Station Interior and Exterior Operational Location Coding System
SSP 41000	System Specification for the International Space Station
SSP 41161	Segment Specification for the United States Ground Segment
SSP 41162	Segment Specification for the United States On-Orbit Segment
SSP 41163	Russian Segment Specification
SSP 50004	Ground Support Equipment Design Requirements
SSP 50005	International Space Station Flight Crew Integration Standard (NASA-STD-3000/T)
SSP 50007	Space Station Inventory Management System Bar Code Label Requirements and Specification
SSP 50011-01	Concept of Operation and Utilization Volume I: Principles
SSP 50014	International Space Station Utility Coding Specification

SSP 50021	Safety Requirements Document
SSP 50094	NASA/RSA Joint Specifications Standards Document for the ISS Russian Segment
SSP 50146	NASA/RSA Bilateral S&MA Process Requirements for International Space Station
SSP 50200-05 Part 1	Station Program Implementation Plan, Volume 5: Logistics and Maintenance, Part 1: Maintenance
SSP 50200-05 Part 2	Station Program Implementation Plan, Volume 5: Logistics and Maintenance Part 2: Logistics
SSP 50200-06	Station Program Implementation Plan, Volume 6: Cargo Physical Processing
SSP 50260	International Space Station Medical Operations Requirements Documents (ISS MORD)
SSP 50480	ISS Joint Medical Operations Implementation Plan (JMOIP)
SSP 50489 Revision B	ISS Mission Integration Template
SSP 50621	Generic On-Orbit Stowage Capabilities and Requirements: Pressurized Volume
SSP 54500	International Ground System Specification Document
SSP 57000	Pressurized Payloads Interface Requirements Document
SSP **<TBD 1-1>**	ATV Transfer Book
NSTS 1700.7B	Safety Policy and Requirements for Payloads Using the Space Transportation System
NSTS 1700.7B ISS Addendum	Safety Policy and Requirements for Payloads Using the International Space Station
NSTS 07700, Vol II. Book 3	Program Structure and Responsibilities Book 3 Space Shuttle Program Interface Agreements
NSTS 18798	Interpretations of NSTS/ISS Payload Safety Requirements
NSTS 22254	Methodology for Conduct of Space Shuttle Program Hazard Analyses

JSC 28484	Program Requirements Document for Johnson Space Center Non-critical Government Furnished Equipment
KHB 1040.1	KSC Comprehensive Emergency Preparedness Plan
KHB 1710.2	Kennedy Space Center Safety Practices Handbook
KHB 1840.1	KSC Industrial Hygiene Handbook
KHB 1860.1	KSC Ionizing Radiation Protection Program
KHB 1870.1	KSC Sanitation Handbook
KHB 8800.7	Waste Management Handbook
K-SS-09.5.3	International Space Station Kennedy Space Center Resupply & Return Cargo Ground Processing Plan
П32958-106	ISS Technical Requirements for Hardware to be Stored or Operated on the ISS Russian Segment
OPS-PL-0-008-ESA	Cargo Integration Plan
ATV-HB-AI-0001	ATV Cargo Accommodation Handbook

3.0 WASTE TYPES, SOURCES AND CLASSIFICATIONS

The following three sections describe types of waste applicable to ISS, sources of waste on ISS, and waste classifications. Immediately below is an explanation of the two responsible sides involved with waste management. This is given as further clarification to aid in the interpretation of the document.

United States (US) Side and Russian Side:

There are two responsible sides for the purposes of this document and the processes associated with ISS waste disposal. The two sides are US and Russian. All waste management responsibilities of Canadian Space Agency (CSA), European Space Agency (ESA), Japan Aerospace Exploration Agency (JAXA), and National Aeronautics and Space Administration (NASA) are considered the US side. All waste management responsibilities of Federal Space Agency (FSA) are considered the Russian side.

3.1 TYPES OF WASTE

Waste is comprised of crew common waste, hardware waste, payload waste, and launch restraints that are to be removed from the ISS and are not required to be returned for any purpose. Waste shall be accommodated for removal from the ISS on Shuttle and Soyuz transport vehicles or Progress and Automated Transfer Vehicle (ATV) cargo vehicles.

3.1.1 CREW COMMON WASTE

Crew common waste is common to all members of the ISS crew. Crew common waste includes all ISS waste that is generated by the crew. It consists principally of wet/dry used or expired consumables, non-refurbishable crew provisions, hygiene, food and human waste. Crew common waste may be either hazardous or non-hazardous. Each side bears the responsibility for the stowage and disposal of the total wastes proportional to the share of their crewmembers. See Appendix G for list of crew common waste.

3.1.2 HARDWARE WASTE

Hardware Waste includes any used, defective, or expired hardware. Hardware may be replaced at known rates for items with limited life, or after an unexpected failure. Hardware Waste is assigned to the US and Russian side whose hardware or system generated this waste. US and Russia are responsible for the collection, stowage, and disposal of wastes from the use of their modules of the ISS.

3.1.3 PAYLOAD WASTE

Payload waste is defined as all waste that is generated from the performance of a payload experiment. On-board stowage of payload waste will be evaluated on a case-by-case basis. Payload waste is assigned to the US and Russian side whose

payload generated the waste. Each side is responsible for the collection, stowage, and disposal of wastes from their payloads.

3.1.4 LAUNCH RESTRAINT WASTE

Launch restraint waste is considered anything used to secure cargo on an ISS launch vehicle for delivery to or removal from ISS and that is not required on orbit for other planned usage. The US and Russian side whose launch vehicle delivered the launch restraint to the ISS is responsible for the collection, stowage, and disposal of wastes generated.

3.2 SOURCES OF WASTE

Sources of ISS waste include the following:

A. Flight Crew Equipment (FCE) and crew provisions

B. Systems and subsystems

C. Station Development Test Objectives (SDTOs)

D. Payload hardware and experiments

E. Flight operations material

F. Packaging and wrapping material

3.3 WASTE CLASSIFICATIONS

3.3.1 HAZARDOUS WASTE

Hazardous waste is classified for disposal in accordance with the nomenclature defined in Table 3.3-1, Hazardous Waste Classification.

TABLE 3.3-1 HAZARDOUS WASTE CLASSIFICATION

Waste Category	Class Code	Hazardous Waste Definitions
Batteries	BA	All types of batteries (i.e., Ni-Cad, Alkaline).
Biological/Biomedical	BB	Any solid or liquid that may present a threat of infection to humans, including non-liquid tissue, body parts, blood, blood products, body fluids, and laboratory wastes that contain human disease-causing agents. Also to include used absorbent material saturated with blood, blood products, body fluids, excretions, or secretions contaminated with visible blood or blood products that have dried.
Sharps	SH	Payload and crew-generated needles, syringes, or any intact or broken objects that are capable of puncturing, lacerating, or otherwise penetrating the skin (i.e., glass, scalpels, hard broken plastic, syringes, etc.).
Chemical Hazard	CH	Any waste of a solid, liquid, or semi-solid form contaminated with a chemical substance that requires special handling during disposal.
Radioactive	RA	Solid, liquid, or gaseous materials that are radioactive or become radioactive and for which there is no further use.

3.3.2 NONHAZARDOUS WASTE

Non-hazardous waste is any material (wet or dry), determined to be waste that does not meet any of the hazardous waste classifications. For ground handling, non-hazardous waste is that material which has been determined to be waste that does not meet any definitions and/or criteria of regulated wastes under any Federal, State, or local agencies.

3.3.3 TOXIC WASTE

Toxic waste is considered poisonous. The degree of toxicity for any waste which poses a significant health threat to exposed personnel is identified by five categories defined in SSP 50480, ISS Joint Medical Operations Implementation Plan (JMOIP).

4.0 WASTE CONTAINER

Containment versus Container: Containment is the packaging process required by the Safety Review Panel (SRP) to prevent the crew from being exposed to a hazard. A waste container may be certified to hold dry or wet non-hazardous, hazardous waste, urine, or solid waste or a combination of these types. A container does not protect the crew from any hazards. It merely provides a receptacle for the storage and disposal of waste.

Section 4 addresses standard and non-standard waste containers. For standard waste containers, there are three sections describing the usage certification, vehicle certification, and usage rates. Non-standard waste containers are assessed on a case by case basis.

4.1 STANDARD WASTE CONTAINER

Waste container hardware descriptions are located in Appendix B. Standard waste stowage containers have been defined and are made available for on-orbit use and disposal based upon standard waste generation rates. Standard waste containers are manifested by the Rocket Space Corporation - Energia (RSC-E) Cargo Flow Group and the NASA Waste Management Group. The complement of standard waste container hardware accommodates both planned and off-nominal operations.

4.1.1 WASTE CONTAINER USAGE

Table 4.1-1, Waste Container Usage, summarizes the types and general use of current waste hardware. Special handling requirements for hazardous waste are documented in Section 6.1. Crew common waste may be stowed in containers listed in Table 4.1-1. Waste from hardware waste and payloads are evaluated on a case by case basis.

TABLE 4.1-1 WASTE CONTAINER USAGE

Container	Dry Waste	Wet Waste	Contained Hazardous Waste	Urine	Solid Waste	Primary/ Contingency
KBO-M (11ф615.8715-0A15-01)	X	X	X(1)			P
RLB (for KBO-M packing) (11ф615.8716-20A15)	X	X	X			P
KTO (11ф615.8720A55-0) (2)					X	P
EDV (11ф615.8711-0A15-1) (2)				X		P
Food Waste Bag (11ф615.8716-0A15)	X	X				P
Crumb Bag (11ф615.8717-0A15)	X					P
General Use Sharps Container (KLSH320043-302)			X(5)			P
Hefty Cinch Saks (SLZ33112284-001) (4)	X		X			C
Black Polyliner Bags (SLZ33112285-001) (4)	X		X			C
Apollo Bag (10108-10045-01)					X	C(3)
CUCD (10108-10076-05)				X		C(3)
SHCL (SEZ33114033-301)	X	X				C
CTB, HALF-SIZE (P/N SEG33111836)	X					C
CTB, FULL SIZE W/O WINDOWS (P/N SEG33111838)	X					C
CTB, FULL SIZE WITH WINDOWS (P/N SEG33111837)	X					C
CTB, DOUBLE SIZE (P/N SEG33111839)	X					C
CTB, TRIPLE-SIZE (P/N SEG33111840)	X					C
In-flight Stowage Restraint Bag (10108-10075-03)	X					C
JSB, (SEB 13100134-304)	X					C

NOTES:

(1) Only for properly contained biological/biomedical materials (absorbent materials saturated with blood or its products and nasal secretions), batteries and sharps.

(2) Part numbers for the EDV and KTO reflect the complete assembly (EDV buckets and cover; KTO bottoms and case).

(3) To be used only in US segment due to lack of certification for use in the RS.

(4) Black polyliner bags and Hefty Cinch Saks must be contained within non-flammable bags and must not contain sharp hazardous materials.

(5) Will contain sharps that are crew or experiment generated.

C = Contingency
P = Primary

4.1.2 WASTE HARDWARE CONTAINER CERTIFICATION

Table 4.1-2, Waste Container Vehicle Certification, lists the certification status of the current hardware for launch and return in the available ISS transportation vehicles and cargo carriers.

TABLE 4.1-2 WASTE CONTAINER VEHICLE CERTIFICATION

Container	Launch	Disposal
KBO-M (11Φ615.8715-0A15-01)	M, P, MD, Sz	A, M, P, MD, Sz (1)
RLB (for KBO-M packing) (11Φ615.8716-20A15)	M, P, MD, Sz	A, M, P, MD, Sz
KTO (11Φ615.8720A55-0)	M, P, MD, Sz	A, M, P, MD, Sz
EDV (11Φ615.8711-0A15-1)	M, P, MD, Sz	A, M, P, Sz
Food Waste Bag (11Φ615.8716-0A15)	M, P, MD, Sz	P, Sz, A, Internal to KBO-M
Crumb Bag (11Φ615.8717-0A15)	M, P, MD, Sz	Internal to KBO-M
General Use Sharps Container (KLSH320043-302)	M, MD	A, M, P, MD, Sz
Hefty Cinch Saks (SLZ33112284-001)	M, P, MD	A, M, P, MD
Black Polyliner Bags (SLZ33112285-001)	M, P, MD	A, M, P, MD
Apollo Bag (10108-10045-01)	M, MD	A, M, MD
CUCD (10108-10076-05)	M, MD	A, M, MD
SHCL (SEZ33114033-301)	M, MD	A, M, MD
CTB, Half-Size (P/N SEG33111836)	A, M, P, MD, Sz	A, M, P, MD
CTB, Full Size w/o Windows (P/N SEG33111838)	A, M, P, MD, Sz	A, M, P, MD
CTB, Full Size with Windows (P/N SEG33111837)	A, M, P, MD, Sz	A, M, P, MD
CTB, Double Size (P/N SEG33111839)	A, M, MD	A, M, MD
CTB, Triple-Size (P/N SEG33111840)	A, M, MD	A, M, MD
In-flight Stowage Restraint Bag (10108-10075-03)	M, P, MD, Sz	A, M, P, MD, Sz
JSB (SEB 13100134-304)	M, P, MD, Sz	A, M, P, MD, Sz

NOTES:

A = ATV
M = MPLM
MD = Shuttle Middeck
P = Progress
Sz = Soyuz

(1) KBO-M return on the Shuttle in either M-bags or CTB only or confined within an RSR locker.

4.1.3 CREW COMMON WASTE CONTAINER USAGE RATE ESTIMATE

Table 4.1-3, Usage Rates for Crew Common Waste Containers, shows planning data for primary use of waste containers.

TABLE 4.1-3 USAGE RATES FOR CREW COMMON WASTE CONTAINERS

Container	Consumption Rate (Man Days)
*KBO-M (11ф615.8715-0A15-01)	10
Food Waste Bag (11ф615.8716-0A15)	1.5
**EDV (11ф615.8711-0A15-1)	12
KTO (11ф615.8720A55-0)	20
General Use Sharps Container (KLSH320043-302)	540

* Historical consumption rate is 24 man days.

** EDVs can be reused after they are emptied for a time period of up to 90 days of waste contact time.

4.2 NON-STANDARD WASTE CONTAINERS

Waste that is not accommodated by standard waste containers, due to size, shape, etc. is contained in special handling hardware. This hardware is provided by the system/payload organization responsible for the system/payload that generates the waste. These containers are included within the allocation provided to the system/payload by the ISS Program. These containers may be incorporated into the standard ISS complement of available waste hardware if it is determined that there might be a need for this type of container by future users. All non-standard waste containers should be certified for disposal on any available vehicle.

5.0 WASTE MANAGEMENT RESPONSIBILITIES

Waste management responsibilities are spread among multiple disciplines and organizations. This section describes four areas of waste management responsibility.

5.1 WASTE CONTAINERS, SAFETY AND HANDLING

5.1.1 WASTE CONTAINERS

Hardware and payload providers are responsible for estimating the mass/volume of their waste and verifying that the waste they generate is accommodated by the crew common waste containers.

If a new container is required, the hardware/payload provider has the responsibility to ensure that unique containers are certified for use in the ISS and disposal on any vehicle. They must also ensure that sufficient quantities are fabricated to support training and qualification needs and delivered in time for bench reviews.

Requirements for new US-developed hardware and modifications to existing containers are presented to the MIOCB for concurrence. Upon approval, the Trash/Waste Integration Group (TWIG) presents requests for new hardware development to the Vehicle Control Board (VCB). Approval and funding for hardware design and development is determined by the VCB. Project management oversight is performed by the Systems Integration Office.

5.1.2 FLIGHT SAFETY

The hardware providers are responsible for the safe containment, storage, and disposal of hazardous waste in accordance with the following Program safety and certification requirements: SSP 50146, NASA/RSA Bilateral S&MA Process Requirement for ISS, Attachment D - NASA/ROSAVIAKOSMOS General Principles and Requirements for ISS Cargo Safety (for Russian Transport Vehicles); SSP 50021, Safety Requirements Document; NSTS 1700.7B, Safety Policy and Requirements for Payloads Using the Space Transportation System; and NSTS 1700.7B ISS Addendum, Safety Policy and Requirements for Payloads Using the International Space Station. The hardware provider must develop and present the required safety documentation in accordance with SSP 30599, Safety Review Process, to the relevant forums: SRP, Payload Safety Review Panel (PSRP), Safety and Mission Assurance Review Team (SMART), Joint American-Russian Safety Working Group (JARSWG) and RSC-E Safety Panel (for hardware located in Russian elements or vehicles) for approval. In addition, the hardware provider must supply specific safety certification data as required by the Waste Management Request (WMR), described in Section 5.4.4 for all waste items.

5.1.3 GROUND SAFETY

Ground safety reviews are conducted to protect personnel, facilities, equipment, other payloads, the Shuttle, the flight crew, the general public, public and private property, and the environment from injury or damage during ground processing operations of waste. The Ground Safety Review Panel (GSRP) evaluates the design of Ground Support Equipment (GSE) and the ground processing operations performed in accordance with KHB 1700.7, Space Shuttle Payload Ground Safety Handbook. Ground SDPs are submitted by the payload/system hardware developers for the GSRP review in accordance with NSTS/ISS 13830, Payload Safety Review and Data Submittal Requirements for Payloads Using the Space Shuttle/International Space Station, or SSP 30599, Safety Review Process.

5.1.4 WASTE HANDLING

The US system managers and Payload Developers (PD) are responsible for providing waste handling procedures. The TWIG, together with the RSC-E Cargo Flow Group, are responsible for integrating these waste handling requirements and providing them to the Mission Control Center (MCC). The system manager(s) or payload developer(s) support the appropriate Mission Operations Directorate (MOD) representative in developing waste handling procedures, timeline requirements, and training and operational documentation for mission-specific and system-unique or payload-unique cases.

Kennedy Space Center (KSC) Waste Processing Team representatives are responsible for developing Shuttle ground handling procedures in compliance with US federal, state and local guidelines.

Russian payload specialists submit waste handling requirements to the RSC-E Cargo Flow Group to dispose of waste resulting from experiments.

5.2 WASTE ALLOCATION/STOWAGE

5.2.1 ALLOCATION

Allocations for on-orbit stowage of US waste and waste consumables are established by the Requirements Integration Panel (RIP). Allocations for payloads, including payload waste, are defined in the Increment Definition and Requirements Document (IDRD), SPP 5410X.

Hardware providers/payload managers are responsible for ensuring that their allocations include waste stowage and waste stowage hardware.

A standard stowage volume for waste shall be specified and documented for each increment. The standard waste stowage volume shall comply with habitability stowage constraints as defined in SSP 50261-01. The required volume shall be based on intervals between logistics vehicle undockings according to the assembly sequence,

and the specific crew size. The total waste generation will be temporarily stowed within the ISS habitable volume and remain within the allocation. This volume will be as far from the primary crew living and working locations as practical, and must not be used for the nominal stowage of other items.

5.2.2 ON-ORBIT STOWAGE INTEGRATION

The Stowage Integration Working Group (SIWG) utilizes waste estimates in its planning process and factors in "actual" waste disposal volumes in the overall on-orbit stowage integration process. The SIWG periodically provides waste candidate recommendations to the TWIG, in an effort to manage ISS on-orbit stowage.

5.3 CREW TRAINING

JSC 36301, International Space Station Crew Training Catalog, defines overall crew training. The "ISS Habitability Equipment and Procedures 21105" class reviews all waste hardware and operational constraints. It is provided to Expedition crews by MOD Crew Systems. The Crew Systems group coordinates with the TWIG to ensure that the latest data is provided to the crew. The Systems Integration Office provides the hardware for use in the class.

The Gagarin Cosmonaut Training Center (GCTC) provides training to the Expedition crew for Russian-supplied hardware and disposal on Progress and Soyuz. A refresher is provided, as required, when significant changes have occurred. ESA provides training for the disposal of waste on ATV at the European Astronaut Center (EAC).

Payload developers with unique waste hardware provide training within their payload training sessions for those unique items.

5.4 INCREMENT DISPOSAL PLANNING

5.4.1 ASSESSMENT

The TWIG, together with the RSC-E Cargo Flow Group, performs an assessment of waste container usage and then manifests additional waste containers as necessary to ensure an adequate supply is available to satisfy on-orbit needs. The assessment is updated as required based on real-time data collected by the operations teams in the MCC (Mission Control Center - Houston (MCC-H) and Mission Control Center - Moscow (MCC-M)).

For US hardware, the TWIG presents requests for hardware fabrication to the FCE Control Board if the hardware is not available in ground inventory. US supplied contingency waste container hardware is manifested on an as needed basis.

The Manifest Requests (MR) of all waste containers to be used on-orbit are coordinated by the TWIG to ensure optimal use of available hardware. The TWIG develops and submits a MR for launch of US hardware. The RSC-E Cargo Flow Group develops and

submits manifest inputs for Russian hardware. The US Manifest Group is responsible for generating a MR based on the Russian manifest input.

Waste container hardware required for the ISS is manifested in the IDRD Annex 1, SSP 5410X-XX, Increment Definition and Requirements Document for Planning Period X, Annex 1: Station Manifest (Series of Annexes of Flight-Specific Station Manifests), in accordance with SSP 50200-02, Station Program Implementation Plan, Volume 2: Program Planning and Manifesting.

The combination of US hardware, Russian hardware and crew common waste is determined for the purpose of identifying the appropriate transport vehicle for its disposal. The TWIG coordinates all requests to dispose US hardware waste. The RSC-E Cargo Flow Group coordinates all requests to dispose Russian hardware waste. The disposal of crew common waste is determined jointly between US and Russia.

5.4.2 FLIGHT READINESS

The TWIG assesses the integrated waste assessments as a requirement for certification for flight and stage readiness and will report results to the Mission Integration and Operations Office.

5.4.3 INCREMENT DEFINITION AND REQUIREMENTS DOCUMENT

The TWIG provides a pre-flight input, coordinated with the RSC-E Cargo Flow Group, to each IDRD (SSP 5410X), relating to waste disposal on various vehicles. This input will be based on the assessments of waste generation, allocation, and vehicle capability. The post-flight actual disposal list will be documented in the IDRD Annex 1 for each vehicle.

5.4.4 WASTE IDENTIFICATION

For the TWIG to develop a plan for waste management, data from hardware and payload providers must be submitted via a WMR. Data required on the WMR includes mass, volume, part identifiers, and safety certification information. WMRs are available through the Management Information Database Automation System (MIDAS) suite of applications located at web address http://iss-www.jsc.nasa.gov:1532/midasagnt/plsql/midas_home_oas.

For Russian hardware to be disposed on Shuttle or ATV, Russia shall provide the US side with the same data.

The data provided on the WMR as well as the data received from the Russian side will be used to determine what will be disposed on Progress, ATV, Shuttle, or Soyuz. See Section 7 for vehicle specific processes.

5.4.5 JOINT WASTE MANAGEMENT TELECON

The TWIG conducts a bi-monthly telecon with the RSC-E Cargo Flow Group to discuss on-going waste assessments and analysis. This forum is used to exchange information, discuss and approve planning documentation, and answer questions between US and Russian waste management specialists. Telecons will be conducted with ESA Cargo Integration Group for any planning and discussion that affects ATV.

5.4.6 POST INCREMENT CREW DEBRIEF

The TWIG participates in the debrief activities of each increment crew to obtain information that will help planning subsequent increments. Crew concerns and lessons learned will be coordinated with RSC-E and ESA.

6.0 ON-ORBIT PROCESSES

The following section describes on-orbit waste processes by addressing the three major components that are involved. Various aspects of containment, handling and labeling are described in Section 6.1. This is followed by stowage aspects in Section 6.2. Section 6.3 involves periodic statuses.

6.1 WASTE CONTAINMENT, HANDLING AND LABELING

The following six sections describe the containment, handling, and labeling requirements for battery, biological/biomedical, sharps, chemical, radioactive, and non-hazardous waste.

All waste containers disposed on the Shuttle require a label identifying the waste type. Labels will be visible on the outermost container and be marked in accordance with the example shown in Appendix D. Waste containers disposed on expendable vehicles do not require labels.

6.1.1 BATTERY WASTE

Crewmembers will inspect batteries for damage prior to disposal in a ziplock bag. If damaged, batteries will have both terminals taped. All 9 Volt (V) batteries will have both terminals taped.

6.1.2 BIOLOGICAL/BIOMEDICAL WASTE

Biological/Biomedical waste must first be sealed in a ziplock bag, and then contained in a Soft Trash Bag (KBO-M) (Russian Segment (RS) Soft trash bag, 11Ф615.8715-0A15-01).

6.1.3 SHARPS WASTE

All sharps waste is placed in an approved sharps container for disposal. Sharps containers must be puncture resistant, leak proof, and sealable.

6.1.4 CHEMICAL WASTE

Individual chemical waste types (based on chemical properties and not on hazard levels) must be stowed for disposal in separate sealable waste containers. A second level of containment may be required on each chemical waste container when attempting to stow multiple chemical waste containers in the same larger size container; unless the appropriate safety review panel certifies that multiple chemical waste containers are compatible when stored in proximity to one another.

6.1.5 RADIOACTIVE WASTE

Radioactive waste is packaged, labeled, and handled in accordance with requirements established by the KSC Radiation Protection Officer/Johnson Space Center (JSC) Radiation Health Office and approved by the appropriate safety review panel. An assessment for these hazards will be made on a case-by-case basis.

The NASA Chief Radiation Safety Officer must evaluate any waste that is identified as a radiation emitter prior to disposal on an expendable vehicle. For US hardware/ payloads, JSC Form 44, Ionizing Radiation Source Data Sheet - Space Flight Hardware and Applications, is required to be submitted in order to define radioactive material and procedures (labeling, isolation, removal, etc.). This form is part of the Safety Data Pack.

According to the Nuclear Regulatory Commission (NRC), the container for urine may be disposed if the effluent concentration of the radioactive waste does not exceed the concentration provided by NRC. The limiting concentration varies from 10^-6 to 10^-3 Curie (Ci)/milliliter (ml), depending on the type of the radioactive material, where 1 Ci is equal to 3.7 x 1010 disintegrations per second. The waste can be burned once the effluent concentration is below the limit.

Disposal of radioactive waste on Progress or ATV will be evaluated on a case-by-case basis.

6.1.6 NON-HAZARDOUS WASTE

There are no special on-orbit handling requirements for non-hazardous waste.

6.2 STOWAGE

6.2.1 WASTE STOWAGE LOCATIONS

A limited amount of waste can be re-stowed into volumes from which the hardware/consumables were removed.

In order to maintain a hygienic environment, waste and associated by-products should not be left onboard longer than necessary. Waste should not be stowed in the principle crew living and working areas as defined in SSP 50261-01.

The on-orbit Stowage Integration Working Group is responsible for stowage of filled waste hardware. The Service Module (SM) Transfer Chamber may be used for stowage of waste, especially the Container for Water/Urine (EDV) and KTO. A stowage volume of 10 Cargo Transfer Bag Equivalent (CTBE) is allocated in the US segment. This location is at crew discretion.

6.2.2 UNUSED WASTE HARDWARE STOWAGE LOCATION

Used waste hardware stowage should not be stowed next to food, clothing, hygiene, medical consumables, or medical equipment.

6.3 PERIODIC STATUS TO GROUND

The Increment Management Center (IMC) will obtain a status from the crew on waste hardware and real-time waste generation. This is supplied to the US TWIG co-chair for incorporation into Cargo Flow waste management assessments. In addition, this will assist the Waste Management group's ability to ensure that an adequate supply of waste containers are onboard. Typically, these waste status requests will occur on a monthly basis, but can occur at greater or lesser intervals as required by the Program.

6.4 LABELING

Waste containers disposed on expendable vehicles do not require labels.

All waste containers disposed on the Shuttle require a label identifying the waste type.

A waste label is provided for use on waste containers. This label may be affixed to the containers via adhesive or tied with string (provided with these labels), depending on the container. The Expedition crew will select the most appropriate method. An example of the label is provided in Appendix F. The official version will be located in JSC 27260, Decal Process Document and Catalog.

Bags should not be transferred to the Shuttle without prior verification that this label is attached. This will be accomplished by comments on the transfer cue cards. It is also important for purposes of safe ground handling that this label is marked accurately and completely.

Labeling standards for items on orbit are covered in SSP 50094, NASA/RSA Joint Specifications Standards Document for the ISS Russian Segment.

6.4.1 NON-HAZARDOUS WASTE LABELING

For non-hazardous waste, the waste label identifies wet or dry status.

6.4.2 HAZARDOUS WASTE LABELING

For hazardous waste, the waste label on the outermost containment barrier shall identify all battery (BA) hazards, biological/biomedical (BB) hazards, sharp (SH) hazards, chemical (CH) hazards, and/or radioactive (RA) hazards. Chemical hazards are identified by circling the chemical logo on the label and by indicating the payload or system that the chemical waste came from. Radiation hazards are identified by circling the radiation logo on the label and by annotating the isotope and date that the radiation hazard was produced.

The containment packaging and labels are provided by the System/Payload Developer and stored with their hardware.

6.4.3 TOXICITY IDENTIFICATION

When multiple types of hazardous waste are accumulated in a single hazardous waste container, the outermost container label shall indicate the highest level of toxicity contained (0-4).

7.0 WASTE DISPOSAL PLANNING

All waste is removed from ISS via return or expendable vehicles, the Space Shuttle in Multi-Purpose Logistics Module (MPLM), Spacehab or Middeck), Soyuz or the Progress. The following section defines waste disposal priorities, manifest planning for waste disposal, and vehicle constraints or requirements.

7.1 PRIORITIZATION FOR REMOVAL

In order to minimize the quantity of hazardous waste on ISS, the nominal priority for removal of waste is as follows:

1) Hazardous waste

2) Urine (e.g., EDV)

3) Solid human waste (e.g., KTOs)

4) Wet non-hazardous waste

5) Dry non-hazardous waste

7.2 DOWN MANIFEST PLANNING

All items being disposed are manifested on a specific return or expendable vehicle.

The initial step in this process is the identification of waste to be disposed. The TWIG and the RSC-E Cargo Flow Group jointly agree to the quantity of crew-common waste available for disposal. Russia and the US are each responsible for the disposal of 50 percent of crew common waste. Additionally, each side is responsible for their own payload and hardware waste. Use of expendable vehicles is preferred by the ISS Program for waste disposal. Crew common waste can be disposed on any vehicle (Soyuz, Progress, Shuttle, or ATV) in any of the primary or contingency waste containers as defined in Table 4.1-1. The use of Russian provided containers by the US side for disposal of crew common waste is negotiated by separate agreement. In addition, compensation for disposal of crew common waste above the 50% limit is also negotiated by separate agreements.

7.3 UNITED STATES WASTE DISPOSAL ON RUSSIAN VEHICLES

General information and requirements on the Progress/Soyuz vehicles, as well as cargo integration schedules and milestones are provided in document П32928-103, Requirements for International Partner Cargo Transported on Russian Progress and Soyuz Vehicles. To facilitate the waste integration process on the Progress and Soyuz vehicles, the US side should submit a request to RSC-E to include the waste in the manifest no later than six weeks before vehicle undocking. The official schedule is documented in SSP 50489, ISS Mission Integration Template, Revision B. The possibility of disposing of US wastes on the Progress/Soyuz is determined by the results of a review of the dimensional installation drawings and safety data.

The Russian Safety Group coordinates with US Safety as required during the process of review of the safety of waste hardware for disposal on Progress/Soyuz vehicles.

7.3.1 PROGRESS WASTE DISPOSAL

The Progress vehicle is one of the primary means of removing waste from the ISS.

Waste may be accommodated in the Progress cargo compartment and in the Rodnik system tanks (for the Progress-M vehicles only). In the Rodnik system tanks, only liquid waste may be stowed. Waste stowed in the cargo compartment must be firmly secured to prevent movement inside the Progress cargo compartment.

A volume of approximately 6 cubic meters (m^3) is available in the cargo compartment for waste stowage. The Rodnik tanks have approximately 420 liters of liquid waste stowage volume available. Therefore, assessments assume up to 19 EDVs may be dumped into these Rodnik tanks and reused.

The total mass of waste to be removed depends on the propellant margin in the vehicle propulsion system tanks, the vehicle constraints associated with mass properties and the vehicle flight plan after undocking from the ISS. In the cargo compartment, the mass can be as much as 1700 kilograms (kg).

7.3.2 SOYUZ WASTE DISPOSAL

A volume of approximately 1 m^3 is available in the Soyuz orbital module for waste stowage with the mass of all waste to be disposed not exceeding 100 kg.

Tanks with liquid that are stowed in the Soyuz orbital module should remain sealed during orbital module depressurization. Orbital module depressurization occurs prior to separation from the Descent module.

7.4 SHUTTLE WASTE DISPOSAL

SSPIA 039, Memorandum of Agreement Between the International Space Station Program and Space Shuttle Program, is an agreement to return waste on the Shuttle. Any waste that is transported to the ground must be properly contained and labeled to ensure safe conditions for ground handling. Transfer cue cards are used to instruct the crew that labels are required.

MR for Shuttle waste disposal should be submitted in adequate time to support the mission integration schedule. For Shuttle launch and return, the MR is due to the Manifest Working Group (MWG) for the baseline manifest at launch minus (L-)15 months. The first US flight specific manifest is baselined at the L-12 months. Updates occur through launch via MR. Real-time updates occur via the CHIT process. The MR/CHIT will include unique stowage/packaging requirements. MR's are incorporated into the IDRD Annex 1, SSP 5410X-XX.

The KSC/GSRP is provided data for waste containers that may be disposed of via the Shuttle (MPLM, middeck). For disposal via the Shuttle, the MPLM, if available, is preferable over middeck.

The Russian Safety Group coordinates Russian waste disposal with the Mission Evaluation Room (MER) Safety Console as required for Russian waste to obtain safety approval of waste hardware disposed in the Shuttle middeck, Spacehab, or MPLM.

KSC uses standard ground handling procedures for unloading and disposing of ISS waste. The KSC Ground Processing Team will be prepared to handle any anomalous conditions which may occur during waste deintegration and transport.

Waste is transferred to the KSC Waste Ground Processing Team for disposal. Containers labeled as non-hazardous wet or dry shall not be opened. Containers identified as containing hazardous waste will be opened for the purpose of sorting per waste category. The disposal of all waste will follow US federal, state and local guidelines.

7.5 AUTOMATED TRANSFER VEHICLE WASTE DISPOSAL

The ATV is one of the primary means of removing waste from the ISS. General information on the ATV and the requirements levied against documentation to be submitted are contained in OPS-PL-0-008-ESA, Cargo Integration Plan. To facilitate the waste integration process on ATV, the TWIG will submit return manifest data to ESA ATV Cargo Integration Group per schedule contained in SSP 50489 Revision B.

Before final stowage of waste on the ATV, equipment stowed in the cargo compartment that must be disassembled and/or relocated to ISS will be documented in the ATV Operations Data File (ODF), unless there is a vehicle redocking requirement.

Liquid waste may be accommodated in the ATV Integrated Cargo Carrier (ICC) within the wastewater tanks. Waste stowed in the ATV cargo compartment must be firmly secured to prevent movement. SSP **<TBD 1-1>**, ATV Transfer Book, will contain waste stowage recommendations.

A volume of approximately 10.5 m^3 and up to 5,500 kgs of pressurized dry cargo space is available in the cargo compartment for waste stowage. The wastewater tanks have about 840 liters of liquid waste stowage volume available. Therefore, assessments assume the contents of up to 38 EDV's may be dumped into these tanks and reused.

The total mass of waste to be removed depends upon the propellant margin in the vehicle propulsion system tanks, the vehicle constraints associated with mass properties, and the vehicle flight plan after undocking from the ISS.

APPENDIX A

ACRONYMS AND ABBREVIATIONS

APPENDIX A - ACRONYMS AND ABBREVIATIONS

ATV	Automated Transfer Vehicle
ASSY	Assembly
BA	Battery
BB	Biological/Biomedical
CH	Chemical
Ci	Curie
CIO	Cargo Integration Officer
cm	centimeter
cm^3	cubic centimeter
CPWG	Crew Provisioning Working Group
CSA	Canadian Space Agency
CTB	Cargo Transfer Bay
CTBE	Cargo Transfer Bag Equivalent
CUCD	Contingency Urine Collection Device
EAC	European Astronaut Center
EDV	Container for Water/Urine
ESA	European Space Agency
EVA	Extravehicular Activity
FEP	Fluorinated Ethylene Propylene
FSA	Federal Space Agency
ft	foot
ft^3	Cubic Feet
GCTC	Gagarin Cosmonaut Training Center
GFE	Government Furnished Equipment
GSE	Ground Support Equipment
GSRP	Ground Safety Review Panel
ICC	Integrated Cargo Carrier
IDRD	Increment Definition and Requirements Document
IMC	Increment Management Center
IMT	Increment Management Team
in.	Inch
IP	International Partner
ISO	Inventory Stowage Officer
ISS	International Space Station
JARSWG	Joint American-Russian Safety Working Group
JAXA	Japan Aerospace Exploration Agency
JMOIP	Joint Medical Operations Implementation Plan

JSB	Jettison Stowage Bag
JSC	Johnson Space Center
KBO-M	Soft Trash Bag
kg	Kilogram
KSC	Kennedy Space Center
KTO	Solid Waste Container
L-	Launch minus
lb	Pound(s)
LPT	Launch Package Team
m^3	cubic meter
MAX	Maximum
MCC	Mission Control Center
MCC-H	Mission Control Center - Houston
MCC-M	Mission Control Center - Moscow
MER	Mission Evaluation Room
MIDAS	Management Information Database Automation System
MIOCB	Mission Integration and Operations Control Board
ml	milliliter
mm	Millimeter
MOD	Mission Operations Directorate
MPLM	Multi-Purpose Logistics Module
MR	Manifest Request
MWG	Manifest Working Group
NASA	National Aeronautics and Space Administration
NRC	Nuclear Regulatory Commission
ODF	Operations Data File
OPS NOM	Operation Nomenclature
P/N	Part Number
PD	Payload Developer
PSRP	Payload Safety Review Panel
RA	Radioactive
RIP	Requirements Integration Panel
RLB	Rubber Lined Bag
RS	Russian Segment
RSA	Russian Space Agency
RSC-E	Rocket Space Corporation - Energia
RSP	Resupply Stowage Platform
RSR	Resupply Stowage Rack
S&MA	Safety and Mission Assurance
SDP	Safety Data Packages

SDTO	Station Development Test Objective
SEB	Source Evaluation Board
SH	Sharp
SHCL	Spacehab Trash Container Liner
SIWG	Stowage Integration Working Group
SM	Service Module
SMART	Safety and Mission Assurance Review Team
SRP	Safety Review Panel
SSCB	Space Station Control Board
SSP	Space Shuttle Program
SSPCB	Space Station Program Control Board
STD	Standard
TBD	To Be Determined
TBR	To Be Resolved
TWIG	Trash/Waste Integration Group
US	United States
V	Volt
VCB	Vehicle Control Board
WMR	Waste Manifest Request

APPENDIX B

GLOSSARY OF TERMS
<RESERVED>

APPENDIX B - GLOSSARY OF TERMS <RESERVED>

APPENDIX C

OPEN WORK

APPENDIX C - OPEN WORK

Table C-1 lists the specific TBD items in the document that are not yet known. The TBD is inserted as a placeholder wherever the required data is needed and is formatted in bold type within brackets. The TBD item is numbered based on the section where the first occurrence of the item is located as the first digit and a consecutive number as the second digit (i.e., **<TBD 4-1>** is the first undetermined item assigned in Section 4 of the document). As each TBD is solved, the updated text is inserted in each place that the TBD appears in the document and the item is removed from this table. As new TBD items are assigned, they will be added to this list in accordance with the above described numbering scheme. Original TBDs will not be renumbered.

TABLE C-1 TO BE DETERMINED ITEMS

TBD	Section	Description
1-1	2.2, 7.54	ESA waste management teams will provide document number closer to ATV launch.
A-1	Appendix A	To be provided by book manager.
E-1	Appendix E	ESA waste management teams will be established closer to ATV launch.
G-1	Appendix G	Waste Management (NASA and RSC-E) will create Appendix.

Table C-2 lists the specific TBR issues in the document that are not yet known. The TBR is inserted as a placeholder wherever the required data is needed and is formatted in bold type within brackets. The TBR issue is numbered based on the section where the first occurrence of the issue is located as the first digit and a consecutive number as the second digit (i.e., **<TBR 4-1>** is the first unresolved issue assigned in Section 4 of the document). As each TBR is resolved, the updated text is inserted in each place that the TBR appears in the document and the issue is removed from this table. As new TBR issues are assigned, they will be added to this list in accordance with the above described numbering scheme. Original TBRs will not be renumbered.

TABLE C-2 TO BE RESOLVED ISSUES

TBR	Section	Description

APPENDIX D

WASTE HARDWARE DESCRIPTION

APPENDIX D - WASTE HARDWARE DESCRIPTION

The waste hardware descriptions provide details for all waste containers available for use on the ISS. These descriptions contain data for users to identify hardware for use by a system/subsystem or payload and facilitate the manifesting process. The hardware descriptions are organized as follows:

A. Russian Supplied Hardware
   1. Prime
      a. KBO-M
      b. Rubber Lined Bag (RLB)
      c. KTO
      d. EDV
      e. Food Waste Bag
   2. Contingency
      a. Crumb Bag

B. US Supplied Hardware
   1. Prime
      a. General Use Sharps Container
   2. Contingency
      a. Hefty Cinch Sak
      b. Black Polyliner Bag
      c. Apollo Bag
      d. Contingency Urine Collection Device (CUCD)
      e. Spacehab Trash Container Liner (SHCL)
      f. Cargo Transfer Bag (CTB), Half-size
      g. CTB, Full-size without windows
      h. CTB, Full-size with windows
      i. CTB, Double size
      j. CTB, Triple size
      k. In-flight Stowage Restraint Bag
      l. Jettison Stowage Bag

OPS NOM: Soft Trash Bag (KBO-M) Контейнер для бытовых отходов мягкий (КБО-М)	ASSY P/N: 11 ϕ 615.8715-OA15-01
Description: The KBO-M has a metal band around the top and rubber flaps to keep the trash inside. This bag can be used for wet or dry trash and can contain hazardous waste.	Material: Heavy duty rubberized cloth
Dimensions (Launch): 11.75 in. x 11.75 in. x 2 in. / 29.8 cm x 29.8 cm x 5.1 cm	Dimensions (In Use/Full): 17 in. height x 11.5 diameter / 43.18 cm height x 29.21 cm diameter
Usable Volume: 0.549 CTBE / 28914.7 cm^3	UNIT MASS Empty: 1.759 lbs / 0.798 kg
Unit Mass (STD/Full): 17.637 lbs / 8 kg	Special Requirements (Yes/No): No
Assembly Required: No	Limited Life: No
Certified for use in all ISS: Yes	Acceptability for Hazardous Waste: Yes - (batteries, sharps containers, blood, and nasal secretions)
Launch Stowage Method: In RLB; nominally launched 1:1	Progress Removal Stowage Method: Attached via string to Progress internal structure
MPLM Removal Stowage Method: Inside either RSR locker or CTB if on RSP	Middeck Removal Stowage Method: N/A

FIGURE D-1 SOFT TRASH CONTAINER

OPS NOM: Rubber Lined Bag Пакет для отходов	ASSY P/N: 11ϕ615.8716-20A15
Description: It can contain up to 3 full KBO-M bags or approximately 8 table bags. It has a draw string closure and is nominally closed tighter with the rubber ties known as “szkoo’tee”. It should be wiped down before reuse. The crew prefers this bag for wet trash.	Material: Rubberized cloth. Not as heavy duty as the KBO-M, but larger
Dimensions (Launch): 29.8 cm x 29.8 cm x 5.6 cm / 11.75 in. x 11.75 in. x 2.2 in. (folded around KBO-M)	Dimensions (In Use/Full): Approximately 25 in. height x 15 in. width / 63.5 cm height x 38.1 cm width
Usable Volume: ~ 1.37 CTBE / 72207.96 cm^3	Unit Mass (Empty): 0.661 lbs / 0.3 kg
Unit Mass (STD/Full): 23.7 lbs / 10.75 kg	Special Requirements (Yes/No): No
Assembly Required: No	Limited Life: No
Certified for use in all ISS: Yes	Acceptability for Hazardous Waste: Yes, dry trash, wet trash, batteries, sharps containers, and biological/biomedical waste
Launch Stowage Method: Folded around KBO-M	Progress Removal Stowage Method: Strap it in
MPLM Removal Stowage Method: In RSR locker; standalone	Middeck Removal Stowage Method: Middeck locker if volume small enough

FIGURE D-2 RUBBER LINED BAG

OPS NOM: Solid Waste Container (KTO) Контейнер твердых отходов (КТО)	ASSY P/N: 11 ϕ 615.8720A55-0 11 ϕ 615.8720A55-20 body 11 ϕ 615.8720A55-10 lid
Description: KTO is used for solid waste and can contain biological waste	Material:
Dimensions (Launch): body 12.99 in. height x 12.99 in. diameter / 33.0 cm height x 33.0 cm diameter Lid 2 in. height x 12.99 diameter / 5.1 cm height x 33.0 cm diameter	Dimensions (In Use/Full): 14.99 in. height x 12.99 in. diameter / 38.0 cm height x 33.0 diameter cm
Usable Volume: ~ 0.779 CTBE / 41028.4 cm^3	Unit Mass (Empty): 7.76 lbs / 3.50 kg Body: 5.63 lb / 2.53 kg Lid: 2.13 lb / 0.97 kg
Unit Mass (STD/Full): 25.353 lbs / 11.5 kg	Special Requirements (Yes/No):
Assembly Required: Yes	Limited Life:
Certified for use in all ISS: For use in SM	Acceptability for Hazardous Waste: Yes - if needed
Launch Stowage Method:	Progress Removal Stowage Method:
MPLM Removal Stowage Method:	Middeck Removal Stowage Method:

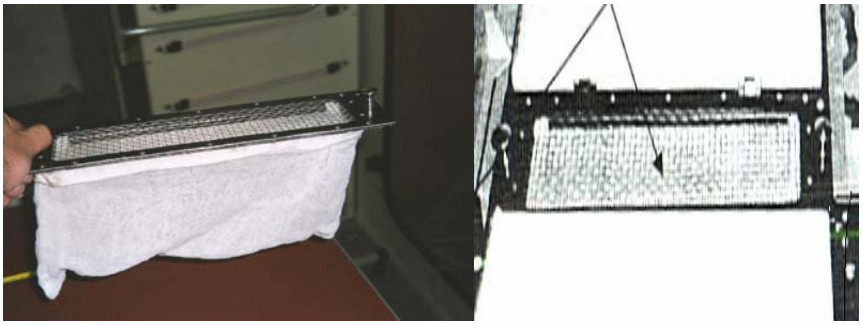
FIGURE D-3 SOLID WASTE CONTAINER

OPS NOM: EDV Контейнер для урины	ASSY P/N: 11ϕ 615.8711-0A15-1 (EDV Assembly) 11Φ615.8711-120A15-1 (EDV bucket) 11Φ615.8711-180A15-1 (EDV lid) 11ϕ 615.8711-100A15 (EDV Adapter) (EDV Adapter) 11ϕ 615.8711-210A15-1 (EDV Fill Indicator)
Description: Primarily used for urine and wastewater collection.	Material:
Dimensions (Launch): EDVs usually launched in set of 6 buckets and separately 6 lids. With rack attachment spike and lid (Top 13.1 in. / 33.4 cm diameter, Height 21.57 in. / 54.8 cm, Bottom 9 in. / 23.0 cm diameter). EDV Bucket 17.362 in. x 12.992 in. diameter / 44.1 cm x 33 cm diameter EDV lid 4.134 in. x 12.992 in. / 10.5 cm x 33 cm diameter	Dimensions (On-Orbit): Without rack attachment spike and lid (Top=33.4 cm diameter, Height=40.0 cm, Bottom=23.0 cm diameter)
Usable Volume: 0.417 CTBE / 22 liters	Unit Mass (Empty): 12.12 lbs / 5.5 kg
Unit Mass (Full): 58.4 lbs / 26.5 kg	Special Requirements: EDV cap should be taped to the hydro-connector body
Assembly Required: Yes	Limited Life: 90-days of on-orbit operations (defined as any operations where the hydro-connector is connected/disconnected). One year of on-orbit stowage is designated for Progress disposal. One year minus 27 days, or 338 days of on-orbit stowage prior to loading in an MPLM for return to ground. An empty EDV may be stored up to 5 years prior to use.
Certified for use in all ISS: Use: SM; Stowage: All	Acceptability for Hazardous Waste: No
Launch Stowage Method: EDV launch support	Progress Removal Stowage Method: Stow in EDV launch support or tie via string to Progress structure
MPLM Removal Stowage Method: RSP and RSR locker	Middeck Removal Stowage Method: Not approved for Middeck removal

FIGURE D-4 CONTAINER FOR WATER/URINE

OPS NOM: Food Waste Bag Пакеты для отходов	ASSY P/N: 11 ϕ 615.8716-OA15
Description: Soft bag used to place table scraps, and other small wet waste items	Material: Soft rubberized cloth
Dimensions (Launch): 10 in. x 5 in. x 0.2 in. / 25.4 cm x 12.8 cm x 0.5 cm	Dimensions (In Use/Full): 8 in. x 5 in. diameter / 20.3 cm x 12.7 cm diameter
Usable Volume: 0.048 CTBE / 2573.998 cm^3	Unit Mass: 0132 lbs / 0.06 kg
Unit Mass (STD/Full): 1.984 lbs / 0.9 kg	Special Requirements (Yes/No):
Assembly Required: No	Limited Life: No
Certified for use in all ISS: Yes	Acceptability for Hazardous Waste:
Launch Stowage Method:	Progress Removal Stowage Method: Inside KBO-M or another bag
MPLM Removal Stowage Method: If placed in RSR or inside another bag	Middeck Removal Stowage Method:

FIGURE D-5 FOOD WASTE BAG



OPS NOM: Crumb Bag ПАКЕТЫ ДЛЯ КРОШЕК	ASSY P/N: 11 ϕ 615.8717-OA15
Description: Bag for crumbs only	Material:
Dimensions (Launch): 16.142 in. x 7.874 in. x 0.079 in. / 41 cm x 20 cm x 0.2 cm	Dimensions (In Use/Full):
Usable Volume:	Unit Mass: 0.066 lbs / 0.03 kg
Unit Mass (STD/Full):	Special Requirements (Yes/No):
Assembly Required:	Limited Life:
Certified for use in all ISS: Yes	Acceptability for Hazardous Waste: No - crumbs only
Launch Stowage Method:	Progress Removal Stowage Method: Inside KBO-M or another bag
MPLM Removal Stowage Method:	Middeck Removal Stowage Method:

FIGURE D-6 CRUMB BAG

OPS NOM: Sharps Container КОНТЕЙНЕР ОБЩЕГО ИСПОЛЬЗОВАНИЯ ДЛЯ ОСТРЫХ ПРЕДМЕТОВ	ASSY P/N: KLSH320043-302
Description: Used to dispose sharp objects such as needles and razor blades	Material: Rubberized cloth
Dimensions (Launch): 7 in. x 3 in. x 7 in. / 17.7 cm x 7.6 cm x 17.7 cm	Dimensions (In Use/Full): 7 in. x 3 in. 7 in. / 17.7 cm x 7.6 cm x 17.7 cm
Usable Volume:	Unit Mass: 0.85 lbs / 0.386 kg
Unit Mass (STD/Full): 3 lbs / 1.361 kg	Special Requirements (Yes/No):
Assembly Required: No	Limited Life:
Certified for use in all ISS: Yes	Acceptability for Hazardous Waste: Yes, sharps
Launch Stowage Method:	Progress Removal Stowage Method: inside KBO-M or other trash bag
MPLM Removal Stowage Method:	Middeck Removal Stowage Method

FIGURE D-7 GENERAL USE SHARPS CONTAINER

OPS NOM: Hefty Cinch Sak, 29 gal. Crew Provisioning Мешок марки Hefty Cinch Sak, затягиваемый, на 29 галлонов	ASSY P/N: SLZ33112284-001
Description:	Material:
Dimensions (Launch): 5.5 in. x 9.5 in. x 0.25 in. / 13.9 cm x 24.1 cm x 0.6 cm (folded)	Dimensions (In Use/Full): Dependent upon contents
Usable Volume: Dependent upon contents max 2.084 CTBE / 109776.9 cm^3	Unit Mass: 0.12 lbs / 0.054 kg
Unit Mass (STD/Full): Dependent upon contents	Special Requirements (Yes/No):
Assembly Required: No	Limited Life:
Certified for use in all ISS: No, not certified for use in RS	Acceptability for Hazardous Waste: Yes - non-sharp hazardous materials with appropriate containment
Launch Stowage Method:	Progress Removal Stowage Method: Taped closed, returned in a jettison stowage bag or RLB
MPLM Removal Stowage Method: Taped closed, returned in a jettison stowage bag or RLB	Middeck Removal Stowage Method: Taped closed, returned in a jettison stowage bag or RLB

FIGURE D-8 HEFTY CINCH SAK

OPS NOM: Black Polyliner Bag Черный мешок фирмы Polyliner	ASSY P/N: SLZ33112285-001
Description: Contingency use bag	Material:
Dimensions (Launch): 5 in. x 8.75 in. x 0.25 in. / 12.7 cm x 22.2 cm x 0.6 cm (folded)	Dimensions (In Use/Full):
Usable Volume: Dependent upon contents	Unit Mass: 0.004 lbs / 0.002 kg
Unit Mass (STD/Full): Dependent upon contents	Special Requirements (Yes/No):
Assembly Required: No	Limited Life: No
Certified for use in all ISS:	Acceptability for Hazardous Waste: Yes - non-sharp hazardous materials with appropriate containment
Launch Stowage Method:	Progress Removal Stowage Method:
MPLM Removal Stowage Method:	Middeck Removal Stowage Method:

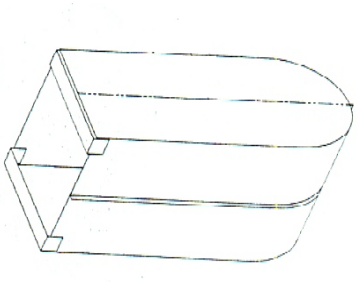
FIGURE D-9 BLACK POLYLINER BAG

OPS NOM: Fecal Collection Assembly (Apollo Bag)	ASSY P/N: 10108-10045-01
Description: Used as a contingency bag for solid human waste	Material:
Dimensions (Launch): Folded fecal and storage bag combined 7.5 in. x 4 in. x 0.375 in. / 19.1 cm x 10.2 cm x 0.9 cm	Dimensions (In Use): unfolded fecal bag with flange seal 7.5 in. x 12 in. x 0.12 in. / 19.1 cm x 30.5 cm x 0.3 cm Dimensions (Full): unfolded storage bag for used fecal bag 7.5 in. x 14 in. x 0.12 in. / 19.1 cm x 35.6 cm x 0.3 cm
Usable Volume: 0.004 CTBE / 206.477 cm	Unit Mass: 0.13 lbs / 0.059 kg
Unit Mass (STD/Full):	Special Requirements (Yes/No):
Assembly Required: No	Limited Life:
Certified for use in all ISS: Yes	Acceptability for Hazardous Waste:
Launch Stowage Method:	Progress Removal Stowage Method:
MPLM Removal Stowage Method:	Middeck Removal Stowage Method:

FIGURE D-10 APOLLO BAG

OPS NOM: CUCD	ASSY P/N: 10108-10076-05
Description: Used as a contingency bag for liquid human waste	Material:
Dimensions (Launch): 6.5 in. x 4.75 in. x 0.25 in. / 16.5 cm x 12.1 cm x 0.6 cm	Dimensions (In Use/Full): 13.5 in. x 19 in. x 0.125 in. / 34.3 cm x 48.3 cm x 0.3 cm
Usable Volume: 0.009 CTBE / 525.41 cm	Unit Mass: 0.07 lbs / 0.032 kg
Unit Mass (STD/Full):	Special Requirements (Yes/No):
Assembly Required: No	Limited Life: No
Certified for use in all ISS:	Acceptability for Hazardous Waste:
Launch Stowage Method:	Progress Removal Stowage Method:
MPLM Removal Stowage Method:	Middeck Removal Stowage Method:

FIGURE D-11 CONTINGENCY URINE COLLECTION DEVICE



OPS NOM: Spacehab Container Liner	ASSY P/N: 9062251-1
Description: Plastic liner that goes inside the Spacehab Trash Container	Material: Clear FEP
Dimensions (Launch): 8 in. x 6 in. x 0.25 in. / 20.3 cm x 15.2 cm x 0.6 cm	Dimensions (In Use/Full): 21 in. x 8 in. x 6 in. / 53.3 cm x 20.3 cm x 15.2 cm
Usable Volume: 0.296 CTBE / 15616.87 cm^3	Unit Mass: 0.12 lbs / 0.054 kg
Unit Mass (STD/Full): Dependent upon contents	Special Requirements (Yes/No):
Assembly Required: No	Limited Life:
Certified for use in all ISS: No, not certified for use in RS	Acceptability for Hazardous Waste: No, to be used for dry and/or pre-bagged wet trash only
Launch Stowage Method: Inside CTB	Progress Removal Stowage Method: The full bag is placed within a non-flammable contaner (CTB, Rubber-Lined Bag, etc.)
MPLM Removal Stowage Method:	Middeck Removal Stowage Method:

FIGURE D-12 SPACEHAB CONTAINER LINER

OPS NOM: Cargo Transfer Bag, Half-size Половинная Сумка СТВ	ASSY P/N: SEG33111836
Description:	Material:
Dimensions (Launch): 16.75 in. x 10.75 in. x 9.75 in. / 42.54 cm x 27.3 cm x 24.8 cm	Dimensions (In Use/Full): dependent upon contents
Usable Volume: 0.54 CTBE / 28769.92 cm^3	Unit Mass: 2.2 lbs / 0.998 kg
Unit Mass (STD/Full): Dependent upon contents	Special Requirements (Yes/No):
Assembly Required:	Limited Life:
Certified for use in all ISS: Yes	Acceptability for Hazardous Waste:
Launch Stowage Method:	Progress Removal Stowage Method:
MPLM Removal Stowage Method:	Middeck Removal Stowage Method:
OPS NOM: Cargo Transfer Bag, Full size without windows Одинарная сумка СТВ	ASSY P/N: SEG33111838
Description:	Material:
Dimensions (Launch): 19.76 in. x 16.7 in. x 9.7 in. / 50.2 cm x 42.5 cm x 24.8 cm	Dimensions (In Use/Full): Dependent upon contents
Usable Volume: 1.0 CTBE / 52924.19 cm^3	Unit Mass: 4.01 lbs / 1.8 kg
Unit Mass (STD/Full): Dependent upon contents	Special Requirements (Yes/No):
Assembly Required: No	Limited Life:
Certified for use in all ISS: Yes	Acceptability for Hazardous Waste:
Launch Stowage Method:	Progress Removal Stowage Method:
MPLM Removal Stowage Method:	Middeck Removal Stowage Method:
OPS NOM: Cargo Transfer Bag, Full size with windows Одинарная сумка СТВ с окошком	ASSY P/N: SEG33111837
Description:	Material:
Dimensions (Launch): 19.75 in. x 16.75 in. x 9.75 in. / 50.16 cm x 42.5 cm x 24.7 cm	Dimensions (In Use/Full): Dependent upon contents
Usable Volume: 1.0 CTBE / 52867.55 cm^3	Unit Mass: 3.7 lbs / 1.678 kg
Unit Mass (STD/Full): Dependent upon contents	Special Requirements (Yes/No):
Assembly Required: No	Limited Life:
Certified for use in all ISS: Yes	Acceptability for Hazardous Waste:
Launch Stowage Method:	Progress Removal Stowage Method:
MPLM Removal Stowage Method:	Middeck Removal Stowage Method:

FIGURE D-13 CARGO TRANSFER BAG (PAGE 1 OF 2)

OPS NOM: Cargo Transfer Bag, Double Size Двойная Сумка CTB	ASSY P/N: SEG33111839
Description:	Material:
Dimensions (Launch): 19.75 in. x 16.75 in. x 18.75 in. / 50.17 cm x 42.5 cm x 47.6 cm	Dimensions (In Use/Full): Dependent upon contents
Usable Volume:	Unit Mass: 4.5 lbs / 2.04 kg
Unit Mass (STD/Full): Dependent upon contents	Special Requirements (Yes/No):
Assembly Required: No	Limited Life:
Certified for use in all ISS: Yes	Acceptability for Hazardous Waste:
Launch Stowage Method:	Progress Removal Stowage Method:
MPLM Removal Stowage Method:	Middeck Removal Stowage Method:
OPS NOM: Cargo Transfer Bag, Triple Size Тройная Сумка CTB	ASSY P/N: SEG33111840
Description:	Material:
Dimensions (Launch): 29.5 in. x 16.75 in. x 19.75 in. / 74.9 cm x 42.5 cm x 50.2 cm	Dimensions (In Use/Full): Dependent upon contents
Usable Volume:	Unit Mass: 6.2 lbs / 2.8 kg
Unit Mass (STD/Full): Dependent upon contents	Special Requirements (Yes/No):
Assembly Required:	Limited Life:
Certified for use in all ISS: Yes	Acceptability for Hazardous Waste:
Launch Stowage Method:	Progress Removal Stowage Method:
MPLM Removal Stowage Method:	Middeck Removal Stowage Method:

FIGURE D-13 CARGO TRANSFER BAG (PAGE 2 OF 2)

OPS NOM: In-flight Stowage Restraint Bag Большой сетчатый мешок	ASSY P/N: 10108-10075-03
Description: Used to contain/stow/temp stow small loose items for clothing after exercise	Material: Made of a webbing material
Dimensions (Launch): 8 in. x 3.5 in. / 20.3 cm x 8.9 cm (rolled)	Dimensions (In Use/Full): Dependent upon contents
Usable Volume:	UNIT MASS: 0.1 lbs / 0.045 kg
Unit Mass (STD/Full): Dependent upon contents	Special Requirements (Yes/No):
Assembly Required: No	Limited Life:
Certified for use in all ISS: Yes	Acceptability for Hazardous Waste: No
Launch Stowage Method: Rolled up inside a CTB	Progress Removal Stowage Method:
MPLM Removal Stowage Method:	Middeck Removal Stowage Method:

FIGURE D-14 IN-FLIGHT STOWAGE RESTRAINT BAG

OPS NOM: Jettison Stowage Bag	ASSY P/N: SEB 13100134-304
Description: Contingency container for hefty cinch sak bag and/or black polyliner bag - Russian equivalent of rubber lined bag	Material:
Dimensions (Launch): 9.75 in. x 9.75 in. x 1 in. / 24.7 cm x 24.7 cm x 2.5 cm	Dimensions (In Use/Full): Dependent upon contents
Usable Volume: ~ 2.199 CTBE / 115815.9 cm^3 (Volume will be reduced if the cord is used to close the bag)	Unit Mass: 0.74 lbs / 0.34 kg
Unit Mass (STD/Full): Dependent upon contents	Special Requirements (Yes/No):
Assembly Required: No	Limited Life:
Certified for use in all ISS: Yes	Acceptability for Hazardous Waste: No
Launch Stowage Method:	Progress Removal Stowage Method:
MPLM Removal Stowage Method:	Middeck Removal Stowage Method:

FIGURE D-15 JETTISON STOWAGE BAG

APPENDIX E

TRASH/WASTE INTEGRATION GROUP

APPENDIX E - TRASH/WASTE INTEGRATION GROUP

The TWIG defines the overall policy for waste management on the ISS. It works with all systems/payloads that generate waste to define a plan to ensure habitability on the ISS. This team is the focus for discussion of all waste issues for the ISS Program. IPs are members of the TWIG to ensure that a single, coordinated plan is implemented. In addition, the TWIG integrates requirements for each waste hardware item. The TWIG submits MRs for ISS waste disposal. The TWIG provides mass, dimension, and drawing data to either the Russian RSC-E Cargo Flow Group or ATV Cargo Integration Group for US waste disposal on Progress/ Soyuz or ATV, respectively. Waste Management documents, assessments and supporting data are located on the following web page: http://iss-www.jsc.nasa.gov/ss/issapt/mio/trash/trash_home.html. The TWIG is co-chaired by the US and Russian ISS Waste Managers. Representatives from the following teams and technical areas participate in TWIG meetings and discussions

RSC-E CARGO FLOW GROUP

The RSC-E Cargo Flow Group determines the projected accumulation of waste, which includes crew waste, replaced (service life and failed) hardware on the ISS RS, structural elements to be removed after the Russian modules are reactivated, and waste from scientific experiments. This group works in close cooperation with specialists in charge of technical and management issues regarding the waste containers with respect to ISS RS crew waste collection and storage. They also work with the standard systems hardware and payload managers and the operations group. The RSC-E Cargo Flow Group coordinates with Russian mission integration and Team 0 management. The RSC-E Cargo Flow Group is a member of the TWIG and coordinates closely with respect to ISS waste operations planning issues and hardware and generation assessments. The RSC-E Cargo Flow Group is also a member of the MWG.

ESA TEAMS

<TBD E-1>

RSC-E INTEGRATION GROUP

The Russian ISS Cargo Integration Group plans stowage of hardware and cargo on the ISS RS, including waste stowage in the ISS RS modules and also the location in Progress and Soyuz to return from the ISS, complying with requirements for these cargo vehicles.

MANIFEST WORKING GROUP (MULTILATERAL)

The MWG reviews hardware requests in support of Station requirements, provides a forum for coordination of manifest assessments with all affected disciplines, and coordinates MR authorization/approval. The MWG is chaired by the ISS Manifest Lead from the Mission Integration and Operations Office.

CREW PROVISIONING WORKING GROUP (MULTILATERAL)

The Crew Provisioning Working Group (CPWG) insures crew supplies are available on-orbit. The CPWG, in coordination with the Astronaut office, Engineering and the TWIG, will provide manifest support as re-supply of contingency waste hardware is required. The chair of the CPWG is in the Mission Integration and Operations Office.

ISS PROGRAM SAFETY AND MISSION ASSURANCE OFFICE

The ISS Program Safety and Mission Assurance (S&MA) Office develops, implements, and assures compliance with ISS Program requirements for integrated safety, which consist of flight, on-orbit, and ground safety. The safety process is identified in Section 6.0, SSP 50200-01, Station Program Implementation Plan, Volume 1: Station Program Management Plan.

RSC-E SAFETY GROUP

The Russian Safety Group together with representatives from the JARSWG shall coordinate as required during the safety process review and aid in certifying waste containers for disposal in Progress vehicles or return in the Soyuz or Shuttle.

NASA INCREMENT MANAGEMENT TEAM

The Increment Management Team (IMT) has the responsibility to integrate and prioritize the consolidated set of increment-specific requirements for re-supply of waste containers and disposal of ISS waste. The IMC has the real-time interface between the MCC and the ISS Program Office for relaying waste management requirements and issues between MOD and the TWIG. The Increment Managers are in the Mission Integration and Operations Office.

NASA LAUNCH PACKAGE TEAM

The Launch Package Team (LPT) has the responsibility to integrate and prioritize the consolidated joint mission (ISS and Space Shuttle Program (SSP)) launch package requirements. The LPT coordinates manifest implementation for waste return with mission operations, Shuttle program and ground processing teams. The Launch Package Managers (LPM) are in the Mission Integration and Operations Office.

NASA MISSION OPERATIONS DIRECTORATE/CREW SYSTEMS TEAM

The MOD Crew Systems team is responsible for training each expedition crew for US waste hardware. During on-orbit operations, this team is on call for questions related to waste hardware and handling.

NASA GOVERNMENT FURNISHED EQUIPMENT FLIGHT PROJECTS REPRESENTATIVE

The Government Furnished Equipment (GFE) hardware curator is responsible for ensuring that all current GFE waste hardware is certified for flight and that new requirements generated by the TWIG are being evaluated and implemented for future increments.

NASA FLIGHT CREW OFFICE

The Flight Crew Office provides a representative to serve as a member of the TWIG and other groups working issues related to waste management and stowage. This representative is responsible for representing the interests of flight crews during the mission planning process and evaluations of hardware for waste stowage.

NASA ISS PAYLOAD OFFICE

The ISS Payload Office provides a summary of data, submitted by the PD, to the TWIG for all payloads planned during each stage and increment with respect to waste generated by each payload and which hazardous categories this waste will encompass. This data will be included in the integrated assessments and in hardware manifest and stowage planning.

NASA EXTRAVEHICULAR ACTIVITY PROJECT OFFICE

The Extravehicular Activity (EVA) Project Office manages manifest and resupply of EVA equipment and provides data for quantities of waste being generated by EVA equipment.

NASA MEDICAL OPERATIONS

The Medical Operations Group representative to the TWIG provides data for medical waste as well as other inputs affecting medical equipment and standards.

HABITABILITY AND ENVIRONMENTAL FACTORS OFFICE /TOXICOLOGY GROUP (MULTILATERAL)

NASA/JSC toxicologists assess ISS hazardous materials for possible toxic hazard effects on the crew as referenced in JSC 26895, Guidelines for Assessing the Toxic Hazard of Spacecraft Chemicals and Test Materials. FSA toxicologists will assess hazardous materials that are located within the Russian elements or vehicles.

KSC WASTE GROUND PROCESSING TEAM

The KSC Waste Ground Processing Team has responsibility for the physical deintegration of waste during post-launch operations. All operations of this team are governed by US federal, state, and local guidelines.

DIRECTORATE/CARGO INTEGRATION OFFICER TEAM

The Inventory Stowage Officer (ISO), who is a member of the Cargo Integration Officer (CIO) team, is responsible for directing the crew via a message as to what items are approved for trash and how they should be packed for disposal. ISO assists with the development of the trash candidates list by notifying the TWIG of items that the crew has requested for trash. Additionally, the ISO identifies items that would take significant crew time to retrieve and the ISO works to optimize the stowage space that is gained from trashing items.

APPENDIX F

WASTE LABEL EXAMPLE

APPENDIX F - WASTE LABEL EXAMPLE

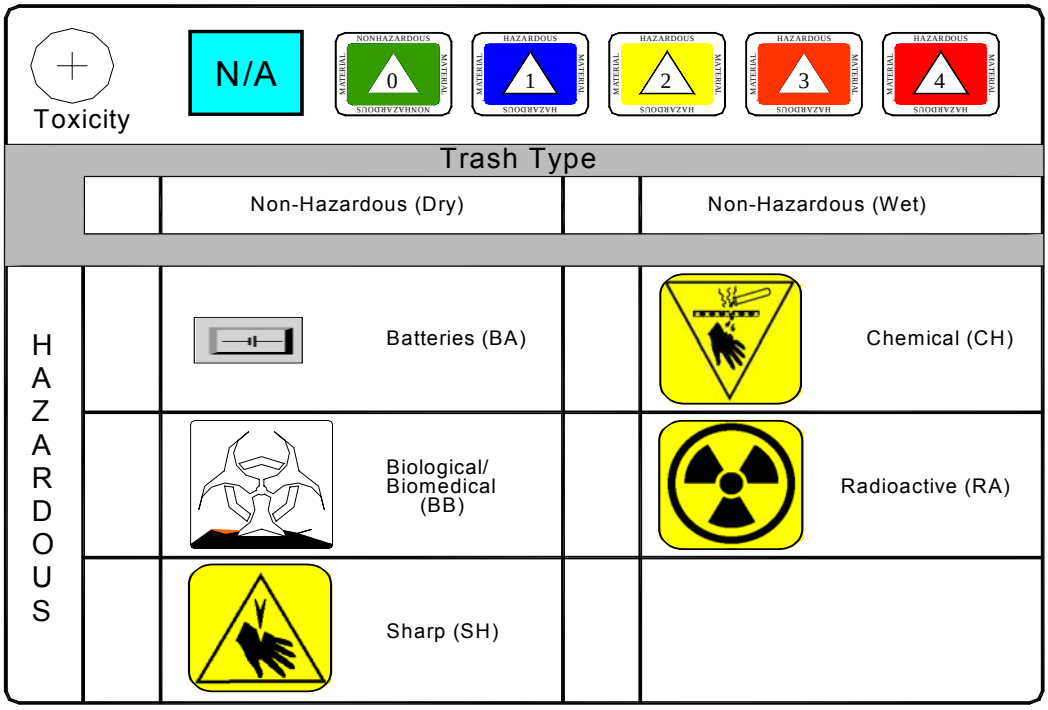


FIGURE F-1 WASTE LABEL EXAMPLE

APPENDIX G

CREW COMMON WASTE

APPENDIX G - CREW COMMON WASTE

MEDICAL OPERATIONS
CHECS-EHS/HMS
NON-HAZARDOUS (COMMON) TRASH

<TBD G-1>