



CARLO GAVAZZI

CARLO GAVAZZI SPACE SpA

# ACOP

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Title : <b>FEEDBACK ON ACOP NASA PIA</b>			

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<b>CHANGE RECORD</b>			
<i>ISSUE</i>	<i>DATE</i>	<i>CHANGE AUTHORITY</i>	<i>REASON FOR CHANGE AND AFFECTED SECTIONS</i>
1	October 05		First issue



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## ANNEX 1: ACOP NASA ICD

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## 1. SCOPE OF THE DOCUMENT

This document provides CGS comments to the document ACOP PIA Rev 1-3 040505:

EXPRESS Payload Integration Agreement for Alpha Magnetic Spectrometer (AMS-02) Crew Operations Post (ACOP), Preliminary version dated 5 April, 2005

simply referred to ACOP NASA PIA and included in annex 1.

The comments are base on CGS contractual commitments, on ACOP System Specification and on the applicable documents.

## 2. DOCUMENTS

### 2.1 APPLICABLE DOCUMENTS

AD	Doc. Number	Issue / Date	Rev.	Title / Applicability
1	SSP 52000-IDD-ERP	D / 6/08/03		EXpedite the PROcessing of Experiments to Space Station (EXPRESS) Rack Payloads Interface Definition Document
2	NSTS/ISS 13830	C / 01/12/1996		Implementation Procedures for Payloads System Safety Requirements – For Payloads Using the STS & ISS.
3	JSC 26493	17/02/1995		Guidelines for the preparation of payload flight safety data packages and hazard reports.
4	SSP 50004	April 1994		Ground Support Equipment Design requirements
5	SSP-52000-PDS	March 1999	B	Payload Data Set Blank Book
6	SSP 57066	October 28, 2003		Standard Payload Integration Agreement for EXPRESS/WORF Rack Payloads
7	GD-PL-CGS-001	3 / 17/03/99		PRODUCT ASSURANCE & RAMS PLAN
8	SSP 52000 PAH ERP	Nov. 1997		Payload Accommodation Handbook for EXPRESS Rack
9	SSP 50184	D / Feb. 1996		Physical Media, Physical Signaling & link-level Protocol Specification for ensuring Interoperability of High Rate Data Link Stations on the International Space Program
10	SSP 52050	D / 08/06/01		S/W Interface Control Document for ISPR ***ONLY FOR HRDL, SECTION 3.4 ***
11	ECSS-E-40	A / April 1999	13	Software Engineering Standard
12	AMS02-CAT-ICD-R04	29/08/2003	04	AMS02 Command and Telemetry Interface Control document. Section AMS-ACOP Interfaces
13	SSP 52000-PVP-ERP	Sept. 18, 2002	D	Generic Payload Verification Plan EXpedite the PROcessing of Experiments to Space Station (EXPRESS) Rack Payloads
14	NSTS 1700.7B	Rev. B Change Packet 8 / 22.08.00		Safety Policy and Requirements for Payloads using the STS
15	NSTS 1700.7B Addendum	Rev. B Change Packet 1 01.09.00		Safety Policy and Requirements for Payloads using the International Space Station
16	SSP 52005	Dec. 10, 1998		Payload Flight equipment requirements and guidelines for safety critical structures
17	NSTS 18798B	Change Packet 7 10.00		Interpretation of NSTS Payload Safety Requirements
18	MSFC-HDBK-527	15/11/86	E	Materials selection list for space hardware systems Materials selection list data
19	GD-PL-CGS-002	1/ 12-02-99		CADM Plan
20	GD-PL-CGS-004	2/07-04-03		SW Product Assurance Plan
21	GD-PL-CGS-005	2/09-05-03		SW CADM Plan

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## 2.2 REFERENCE DOCUMENTS

RD	Doc. Number	Issue / Date	Rev.	Title
1	GPQ-MAN-02	1		Commercial, Aviation and Military (CAM) Equipment Evaluation Guidelines for ISS Payloads Use
2	BSSC (96)2	1 / May 96		Guide to applying the ESA software engineering standards to small software projects
3	GPQ-MAN-01	2 / Dec. 98		Documentation Standard for ESA Microgravity Projects
4	MS-ESA-RQ-108	1 / 28-Sep-2000		Documentation Requirements For Small And Medium Sized MSM Projects
5	PSS-05			Software Engineering Standards
6	GPQ-010	1 / May 95	A	Product Assurance Requirements for ESA Microgravity Payload. Including CN 01.
7	GPQ-010-PSA-101	1		Safety and Material Requirements for ESA Microgravity Payloads
8	GPQ-010-PSA-102	1		Reliability and Maintainability for ESA Microgravity Facilities (ISSA). Including CN 01
9	SSP 52000-IDD-ERP	E / 09/09/03		EXPedite the PROcessing of Experiments to Space Station (EXPRESS) Rack Payloads Interface Definition Document
10	ACD-Requirements-Rev-BL	September 2005	Base Line	ACOP Common Design Requirements Document
11	ACP-SY_CGS-001	3		ACOP System Specification

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### 3. COMMENTS TO ACOP NASA PIA

- Page 3, 7, 9: Launch baseline**  
 ACOP baseline is to be compliant with the requirements for launch inside EXPRESS Rack. Any deviation from this baseline shall be carefully evaluated in terms of design and verification requirements, as well as cost and schedule requirements.
- Page 8 : Documents**  
 Applicable documents listed in section 2.1 ; P-32928-103 and OPS-IDD-0-200 are not currently applicable to ACOP design. ACOP design is in line with RD11, RD10 and with the Technical Annex to the ASI contract.  
  
 Reference documents listed in section 2.2 are currently not available to CGS.
- Page 9: Number of flight units**  
 CGS will provide one of the two flight units.
- Page 10, point 5.5, page 14: FM HW return to Earth**  
 No return of hardware is currently foreseen by CGS contractual commitments.
- Page 10, 14: Crew nominal operation**  
 ACOP will need also crew operation time to clean the air filters of the fan assemblies.
- Table 6.1.1-1 PROGRAM FURNISHED EQUIPMENT GROUND REQUIREMENTS** should be modified and integrated as follows:

EQUIPMENT	QUANTITY	NEED DATE	DURATION	EQUIPMENT-SPECIFIC NOTES
Suitcase simulator (SCS)	1	March 1 <sup>st</sup> , 2006	13 months	Coordinate shipment through JSC AMS-02 Project Office
Taxiscope	1	March 1 <sup>st</sup> , 2006	13 months	Coordinate shipment through JSC AMS-02 Project Office
ERI	1	March 1 <sup>st</sup> , 2006	13 months	Purpose: software testing Coordinate shipment through JSC AMS-02 Project Office
NBOE14-4PNT	2		Payload lifetime	ISS Locker Power Connector, Flange Mount Required for Engineering Model and Qualification Model development
MS27468T15F35P	4		Payload lifetime	ISS Locker Data Connector, Jam Nut Receptacle Required for Engineering Model and Qualification Model development
Express Rack Laptop (as part of the Express Rack)	1	Launch – 3 months	Payload lifetime	Availability at launch site during Integration activities
Softbag for stowage of ORU's	1	Launch – 3 months	Payload lifetime	Availability at launch site during Integration activities

In particular, SCS and Taxiscope are needed to verify the interfaces of the Training Model, of the Qualification Model and of the Flight Model. From here, the need of longer duration of the items availability.

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The need dates are base on the current schedule for the three models above, as indicated in ACOP Master Plan (annex to MoM ACP-MI-CGS-002 dated May 3<sup>rd</sup>, 2005) and the related Engineering Change Proposal ACP-EC-CGS-001 issue 1.

The last two lines of the table should also be included in Table 6.2-1.

## **ANNEX 1: ACOP NASA PIA**