

March 2011

# **Memorandum of Understanding**

## **for Collaboration in the Construction and Installation of the NA62 Experiment**

**between**

The EUROPEAN ORGANISATION FOR NUCLEAR RESEARCH,  
hereinafter referred to as CERN, Geneva, as the Host Laboratory

on the one hand

**and**

an Institution/Funding Agency of the Collaboration

on the other hand.

**Preamble**

- (a) A group of Institutes from CERN Member and non-Member States, and CERN, have agreed to collaborate to form the **NA62 Collaboration (Annex 1)**. This Collaboration has submitted to CERN a '**Proposal to Measure the Rare Decay  $K^+ \rightarrow \pi^+ \nu \bar{\nu}$  at the CERN SPS**'. These Institutes have secured the support of their Funding Agencies to enable them to participate to the execution of the Experiment.
- (b) Agreement to this Collaboration is effected through identical Memoranda of Understanding (MoU) between each Funding Agency or Institute, as appropriate, in the Collaboration and CERN, as the Host Laboratory. These MoUs collectively define the Collaboration and its objectives, and the rights and obligations of the collaborating Institutes.
- (c) On the basis of the Proposal submitted in May 2005 (CERN-SPSC-2005-013) and a detailed review of the scientific merits, the technological feasibility and estimates of the needed resources, the SPS Committee (SPSC) recommended approval of the experiment to the CERN Research Board.
- (d) Based on the recommendation by the SPSC the Research Board approved the experiment on December 8, 2008.
- (e) The cost ceiling for the construction of NA62 is 26.1 MCHF (in 2009 prices, including in kind contributions).
- (f) A Finance Review Committee (FRC) has been constituted which comprises the representatives of all Funding Agencies and the managements of CERN and the Collaboration. It is chaired by the CERN Director of Research.

The role of the FRC includes:

- Monitoring the use of the Common Fund;
- Monitoring the general financial and manpower support;
- Reaching agreement on a maintenance and operation procedure and monitoring its functioning;
- Endorsing the annual construction, maintenance and operation budgets of the experiment.

The collaboration management reports regularly to the FRC on technical, managerial, financial and administrative matters, and on the composition of the Collaboration.

- (h) These Memoranda of Understanding replace the existing Interim Memoranda of Understanding (IMoU).
- (i) This MoU is not legally binding, but the Institutes and Funding Agencies recognize that the success of the Collaboration depends on all its members adhering to its provisions. Any default will be dealt with, in the first instance, by the Collaboration and if necessary then by the FRC.

**Article 1 : Parties to this MoU**

- 1.1 The Parties shall be all the Institutes of the Collaboration as listed in **Annex 1** and their Funding Agencies, and CERN as the host laboratory. **Annex 2** lists the Funding Agencies and their duly authorized representatives. The Funding Agency may be an Institute or an established institution acting on behalf of one or more funding agencies.
- 1.2 The Collaborating Institute(s) and the NA62 Collaboration will hereinafter be referred to as “Institute(s)” and “Collaboration”, respectively.

**Article 2 : Purpose of this MoU**

- 2.1 This MoU defines the construction phase of the NA62 Experiment. Its purpose is to define the programme of work to be carried out for this phase and the distribution of charges and responsibilities among the Parties for the execution of this work. It sets out organizational, managerial and financial guidelines to be followed by the Collaboration.
- 2.2 The construction phase comprises the engineering design, final prototyping, preproduction, construction, calibration, transportation, assembly, installation and commissioning of the elements which will be part of the NA62 Experiment in the underground experimental area.
- 2.3 The Experiment is executed in the normal framework of the CERN scientific programme, approved by the CERN Council, and subject to the bilateral Agreements and Protocols between CERN and non-Member States.
- 2.4 In case of conflict between Agreements or Protocols and the present MoU, the former prevail.

**Article 3 : Duration of this MoU and its Extension**

- 3.1 This MoU is valid for the construction period of the NA62 Experiment and its operation, from 1 October 2009 to a date not earlier than 31 December 2014.
- 3.2 This MoU may be extended at any time by mutual agreement of the Parties.
- 3.3 Any Funding Agency may withdraw its support from the Collaboration by giving not less than eighteen months notice in writing to the Collaboration and the Director General of CERN. In such an event, reasonable compensation to the Collaboration will be negotiated through CERN and confirmed by the FRC.

- 3.4 Any Institute may withdraw from the NA62 Collaboration according to the procedures agreed by the Collaboration, the conditions as set out in the current document "General Conditions for Experiments Performed at CERN" and by giving notice in writing to its Funding Agency.

### **Article 4 : The NA62 Experiment and Collaboration**

- 4.1 The detector for the NA62 Experiment has been described in detail in the Proposal submitted to the SPSC in May 2005 and in the subsequent SPSC Status Reports. It consists of a number of sub-system units as listed in **Annex 3**.
- 4.2 The names of the scientists presently participating in the Collaboration are listed in **Annex 4** by country and by Institute.
- 4.3 The current management structure of the NA62 Collaboration is described in the attached documents (**Annex 5**).
- 4.4 Management and other senior positions within the NA62 Collaboration are listed in **Annex 6**.
- 4.5 **Annex 7** gives an overview of the foreseen construction and data taking schedule.
- 4.6 **Annex 8** indicates the sharing of the contributions to the Common Fund. The sum of the contributions should not exceed 500 kCHF per year.
- 4.7 Following the common practice in use for recent CERN experiments, the needed manpower and financial resources are grouped into three headings:
- 4.7.1 R&D work on the various detector elements ;
  - 4.7.2 costs for infrastructure in the Institutes, and costs for personnel, travel, etc. of the Institutes as arising from their participation in the Collaboration ;
  - 4.7.3 engineering design, final prototyping, preproduction, construction, calibration, transportation, assembly, and installation costs for the complete detector.
- The resources needed for work under the headings 4.7.1 and 4.7.2 are the responsibility of the Institutes supported by their respective Funding Agencies. These resources are neither accounted for in detector construction costs, nor monitored centrally by the Collaboration.
- The resources needed for work under the heading 4.7.3 cover the costs of the detector construction. These costs have been evaluated by the NA62 Collaboration. Only these costs are monitored centrally by the Collaboration.
- 4.8 Any Institute that wishes to join the NA62 Collaboration during the period of validity of this MoU will be expected to make an appropriate contribution to the funding of the detector construction including the Common Projects. This will be negotiated by the Collaboration and endorsed by the FRC. In the event that the detector construction is

already fully funded, the new Institute will have to make a special contribution which will be negotiated by the Collaboration and endorsed by the FRC.

- 4.9 Unless explicitly mentioned, all cost figures in this MoU are expressed in 2009 Swiss Francs based on estimates valid on October 1, 2009. The calculated CERN index for materials cost variations (investments) will be used for cost monitoring purposes throughout the lifetime of the project.

### **Article 5 : Programme of Work for the Construction Phase of the Experiment and Sharing of Responsibilities for its Execution**

- 5.1 The total construction work for the detector is divided into:
- 5.1.1 R&D Phase under the responsibility of the sub-systems;
  - 5.1.2 Sub-system construction, which will be the responsibility of individual Institutes, or groups of Institutes, and
  - 5.1.3 Installation.
- 5.2 **Annexes 9** list, by sub-systems, the deliverables to be provided by the Institutes, the value of these deliverables and the cost sharing among Institutes.
- 5.3 The Institutes, supported by their Funding Agencies, will make their best efforts to design, produce final prototypes, pre-produce, construct, calibrate, transport, assemble, install and commission all the deliverables listed in Annexes 9, within the limits of their funding.

In the event of cost overruns, these will first be brought, by the Institute(s) concerned, to the attention of the Collaboration and then to the FRC, if solutions have not been found. The Collaboration will propose ways of accommodating such overruns within the overall cost ceiling of the NA62 Experiment, including de-scoping or staging if other ways cannot be found, and seek the endorsement of the FRC.

### **Article 6 : Obligations of CERN as the Host Laboratory, and of the Institutions**

- 6.1 The general obligations of CERN as host laboratory and of the Institutions are contained in the current document "General Conditions for Experiments Performed at CERN". This document is regarded as an integral part of this MoU and is attached as **Annex 10**.
- 6.2 All equipment brought to the CERN site must comply with CERN's safety regulations. If relevant, the design, test criteria and testing of equipment should be discussed well in

advance with CERN's safety officials. All equipment brought to CERN must be accessible for inspection by the Group Leader in Matters of Safety.

### **Article 7 : Rights and Benefits of Institutes**

- 7.1 The Institutes participating in the NA62 Collaboration are entitled to join the operational phase of the project and to participate in the scientific exploitation of the data acquired. Further details are set out in the current document "General Conditions for Experiments Performed at CERN".

### **Article 8 : Administrative and Financial Provisions**

- 8.1 General financial matters and purchasing rules and procedures for the experiment, including the rules which apply for Common Fund operations, are dealt with in accordance with the "Financial Guidelines for the LHC Collaborations" (CERN/FC/3796 Revised).
- 8.2 Under the provisions of the CERN basic Convention dated 1st of July 1953, revised on 17 January 1971, any Institute's staff and property located at CERN shall be subject to the authority of the CERN Director General and shall comply with the CERN regulations.

### **Article 9 : Amendments**

- 9.1 This MoU may be amended at any time with the agreement of its signatories or of their appointed successors. Any such amendments will be subject to the prior agreement of the FRC.

### **Article 10 : Disputes**

- 10.1 Any dispute between Funding Agencies shall be resolved by negotiation or, failing that, by arbitration through the President of the CERN Council, who may, at his or her discretion, adopt any form of arbitration process. Any dispute between a Funding Agency and CERN will be resolved using standard CERN procedures for the resolution of such disputes. Any dispute between Institutes will be resolved according to Collaboration procedures.

### **Article 11 : Publication Policy**

- 11.1 The Collaboration will abide to the general publication policy of CERN. In addition, each paper intended for publication in refereed journals will be subject to the internal editorial rules of the Collaboration, including the appointment of an internal independent editor.

**Article 12 : Annexes**

12.1 All the Annexes are an integral part of this MoU. They are understood to be the planning basis for the construction of the Experiment.

**ANNEXES**

**Annex 1:**

Institutes in the NA62 Collaboration and Names of their Representatives to the Funding Agencies

**Annex 2:**

List of Funding Agencies and their Representatives

**Annex 3:**

Sub-system Structure of the NA62 Experiment

**Annex 4:**

Present Participants in the NA62 Collaboration by Country and Institute

**Annex 5:**

Organizational Structure of the NA62 Collaboration

**Annex 6:**

Management and other senior positions within the NA62 Collaboration and the names of the people currently holding them

**Annex 7:**

Tentative NA62 Schedule from 2009 to 2014

**Annex 8:**

Sharing of the Common Fund Contributions

**Annex 9:**

Deliverables to be provided by the Institutes for the individual Sub-systems, their estimated values and the sharing among Institutes

**Annex 10:**

General Conditions for Experiments Performed at CERN.



**The European Organization for Nuclear Research (CERN)**

and

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declare that they agree on the present Memorandum of Understanding for the NA62 Experiment.

Done in Geneva

Done in \_\_\_\_\_

on \_\_\_\_\_

on \_\_\_\_\_

For CERN

For

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Sergio Bertolucci  
Director of Research and  
Scientific Computing

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**Annex 1 Institutes in the NA62 Collaboration and Names of their  
Representatives to the Funding Agencies**

<b>Institute</b>	<b>Represented by</b>
Universite Catholique Louvain (UCL), Belgium	E. Cortina
University of Sofia St. Kliment Ohridski, Bulgaria	L. Litov
J. Gutenberg-Universität Mainz, Germany	R. Wanke
Frascati National Laboratory, Italy	A. Antonelli
University and INFN of Ferrara, Italy	F. Petrucci
University and INFN of Firenze, Italy	M. Lenti
University, INFN and SNS of Pisa, Italy	F. Costantini
University and INFN of Naples, Italy	F. Ambrosino
University and INFN of Perugia, Italy	P. Cenci
University (La Sapienza) and INFN of Rome, Italy	P. Valente
University (Tor Vergata) and INFN of Rome, Italy	A. Salamon
University and INFN of Turin, Italy	F. Marchetto
University of San Luis Potosi, Mexico	J. Engelfried
Joint Institute for Nuclear Research, Dubna, Russia	V. Kekelidze
Institute for Nuclear Research, Russia	V. Bolotov
Institute of High Energy Physics, Russia	V. Obraztsov
CERN, Switzerland	A. Ceccucci
University of Birmingham, UK	C. Lazzeroni
University of Bristol, UK	N. Brook
University of Glasgow, UK	D. Britton
University of Liverpool, UK	J. Dainton
George Mason University, Fairfax, VA, US	P. Rubin
SLAC, Menlo Park, CA, US	D. Coward
University of California, Merced, CA, US	R. Winston

**Annex 2 List of Funding Agencies and their Representatives**

Belgium	Dr. In. V. Halloin, Secrétaire Générale du FNRS
Bulgaria	Prof. L. Litov, University of Sofia
CERN	Dr. S. Bertolucci, Director for Research and Computing
Germany	Prof. V. Bueschler, University of Mainz
Italy	Prof. R. Petronzio, President of INFN
Russia	Prof. V. Matveev, Director of the INR-RAS, Moscow
Russia	Prof. M. Itkis, Acting Director JINR
Russia	Prof. M. Zaitsev, Deputy Director of SRC IHEP
United Kingdom	Prof. J.B. Dainton, University of Liverpool
Mexico	Prof. Juergen Engelfried, University of San Luis Potosi
US	Prof. P. Rubin, George Mason University, Fairfax

### **Annex 3 Sub-system Structure of the NA62 Experiment**

1. Beam Line
2. CEDAR
3. Gigatracker (GTK)
4. Straw Tracker (STRAW)
5. RICH
6. Photon Vetoes (LAV, SAC, IRC)
7. Liquid Krypton Calorimeter (LKR)
8. Muon Veto Detector (MUV)
9. Charged Hodoscope (CHOD)
10. Trigger and Data Acquisition (TDAQ)
11. Computing
12. Infrastructure and DCS

## **Annex 4 Present Participants in the NA62 Collaboration by Country and Institute**

**University of Sofia St. Kliment Ohridski, Bulgaria:** Cvetan Valeriev CHESHKOV, Peter HRISTOV, Venelin KOZHUHAROV, Leander LITOV, Evelina MARINOVA

**Universite Catholique Louvain, Belgium:** Eduardo CORTINA

**Johannes-Gutenberg-Universität Mainz, Germany:** Volker BUESCHER, Manuel HITA-HOCHGESAND, Konrad KLEINKNECHT, Burkhard RENK, Rainer WANKE, Andreas WINHART

**Frascati National Laboratory, Italy:** Antonella ANTONELLI, Bruno DULACH, Giovanni MACCARRONE, Matthew MOULSON, Mauro RAGGI, Tommaso SPADARO

**University and INFN of Ferrara, Italy:** Vittore CARASSITI, Angelo COTTA RAMUSINO, Pietro DALPIAZ, Alberto GIANOLI, Alan NORTON, Ferruccio PETRUCCI, Heinrich WAHL

**University and INFN of Florence, Italy:** Andrea BIZZETI, Francesca BUCCI, Mario CALVETTI, Enrico CELEGHINI, Enrico IACOPINI, Massimo LENTI, Michele VELTRI

**University and INFN of Naples, Italy:** Fabio AMBROSINO, Paolo MASSAROTTI, Marco NAPOLITANO, Vito PALLADINO, Giulio SARACINO

**University and INFN of Perugia, Italy:** Giuseppina ANZIVINO, Patrizia CENCI, Monica PEPE, Mauro PICCINI, Roberto PIANDANI, Antonino SERGI

**University, INFN and Scuola Normale Superiore Pisa, Italy :** Spasimir BALEV, Armando BIGI, Roberto CASALI, Claudio CERRI, Flavio COSTANTINI, Gianmaria COLLAZUOL, Luigi DI LELLA (\*), Niels DOBLE (\*), Riccardo FANTECHI, Sergio GIUDICI, Gianluca LAMANNA, Guido MAGAZZU, Italo MANNELLI, Giuseppe PIERAZZINI, Fabrizio RAFFAELLI, Giuseppe RUGGIERO, Marco SOZZI, Franco Spinella, Stefano VENDITTI

**University (La Sapienza) and INFN Rome, Italy:** Nicola CABIBBO (\*\*), Giulio D'AGOSTINI, Emanuele LEONARDI, Francesco PERFETTO, Marco SERRA, Paolo VALENTE

**University (Tor Vergata) and INFN (Tor Vergata) Rome, Italy:** Vincenzo BONAIUTO, Giovanni CARBONI, Adolfo FUCCI, Gaetano SALINA, Andrea SALAMON, Fausto SARGENI, Emanuele SANTOVETTI

**University and INFN of Turin, Italy:** Cristina BIINO, Giulio DELLACASA, Flavio MARCHETTO, Giovanni MAZZA, Sorin MARTOIU, Angelo RIVETTI

## NA62 Experiment

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**Universidad Autónoma de San Luís Potosi, Instituto de Física, Mexico :** Jurgen ENGELFRIED

**Joint Institute for Nuclear Research (JINR), Dubna, Russia:** Pierluigi FRABETTI, Vladimir KEKELIDZE, Dmitry MADIGOZHIN, Natalia MOLOKANOVA, Sergei MOVCHAN, Irina POLENKEVICH, Yury POTREBENIKOV, Sergei SHKAROVSKIY, Andrey ZINCHENKO

**Institute for Nuclear Research (INR), Russia:** Vladimir BOLOTOV, Evgeni V. GUSHIN

**Institute for High Energy Physics, Russian Federation State Research Centre (IHEP):** Gennady BRITVICH, Oleg CHIKILEV, Victor KURSHETSOV, Vladimir OBRAZTSOV, Vladimir RYKALIN, Vitaly SEMENOV, Oleg YUSHCHENKO

**Universität Bern, Institut für Theoretische Physik, Switzerland:** Simone BIFANI

**Conseil Européen pour la Recherche Nucléaire (CERN), Switzerland:** Augusto CECCUCCI, Hans DANIELSSON, Valeri FALALEEV, Bjorn Inge HALLGREN, Pierre JARRON, Alexander KLUGE, Matthew NOY, Petra RIEDLER, Giorgio STEFANINI

**University of Birmingham, United Kingdom:** Marian KRIVDA, Evgueni GUDZOVSKIY, Cristina LAZZERONI, David MUNDAY, Angela ROMANO, Mark SLATER, Richard STANLEY, Nigel WATSON

**University of Bristol, United Kingdom:** Nick BROOK, Helen HEATH, J. RADEMACKER, D. CUSSANS

**University of Glasgow, United Kingdom:** D. BRITTON

**University of Liverpool, United Kingdom:** Peter COOKE, John DAINTON, John FRY

**George Mason University, Fairfax, VA, USA:** Philip RUBIN

**Stanford Linear Accelerator Center (SLAC), Menlo Park, CA, USA (SLAC):** David COWARD

**University of California, Merced, CA, USA:** Roland WINSTON

(\* ) Presently at Physics Dept. of the Pisa University

(\*\* ) Deceased

## Annex 5 The Organizational Structure of the NA62 Collaboration

1. Concerning all managerial matters, in particular the definition, construction and operation of the detector, the Collaboration is governed by the **Steering Committee**. This board is composed of one representative from each collaborating institution and the Spokesperson, and the Technical Coordinator as ex-officio members. The Steering Committee is chaired by the Spokesperson.
2. All scientific and technical issues are discussed in the **Plenary Meeting** before any major decisions are taken.
3. Concerning all resources and legal matters, the Collaboration is monitored by a **Finance Review Committee** (FRC). This board is composed of representatives of each Funding Agency, with voting rights and by the Collaboration Spokesperson and Technical Co-ordinator. The FRC is chaired by CERN's Director of Research (Chief Scientific Officer).
4. The Coordinators of the sub-systems listed in Annex 3 are appointed by the Steering Committee on proposal by the Spokesperson.
5. The **Spokesperson** represents the Collaboration to the outside and leads the Collaboration. He/she is elected by the Steering Committee in consultation with the CERN management.
6. The **Technical Coordinator** has the responsibility to oversee all technical aspects of the detector construction. In particular, he/she ensures the integration of all sub-systems into the complete detector. With the Spokesperson, he/she also has the responsibility for monitoring the resources of the collaboration. He/she is appointed by the Steering Committee in accordance with the CERN Management.
7. The Group Leader in Matters of Safety (**GLIMOS**) is responsible to the CERN Management for all matters of safety concerning the Experiment personnel, work and equipment on the CERN premises. He/she is appointed by the CERN Management in consultation with the Collaboration Management.

The list of persons presently holding management and other senior positions is presented in Annex 6



**Annex 6 Management and other senior positions within the NA62  
Collaboration and the names of the people currently holding them**

Spokesperson	A. Ceccucci
Technical Co-ordinator	F. Hahn
GLIMOS	V. Falaleev
Coordinators :	
Physics:	G. Ruggiero
Beam Line:	L. Gatignon (EN Liaison Physicist)
CEDAR:	C. Lazzeroni
Gigatracker:	F. Marchetto
Photon Vetoes	A. Antonelli
LKR	R. Fantechi
RICH	M. Lenti
Straw Tracker:	H. Danielsson
Muon Veto Detector (MUV)	R. Wanke
Charged Hodoscope (CHOD)	V. Obraztsov
Trigger & DAQ	M. Sozzi
Computing	P. Valente
DCS:	V. Falaleev

**Annex 7 NA62 Tentative Schedule for 2010- 2014**

2010	Construction
2011	Construction Beam Survey Run
2012	Construction First Physics Run
2013	Data Taking
2014	Data Taking

## Annex 8 Sharing of the Common Fund Contributions for the Maintenance and Operation of NA62

The sum of the NA62 Maintenance and Operation Fund (MOF) contributions should not exceed 500 kCHF per year.

The following table indicates the sharing of the MOF contributions among Funding Agencies

Institute	Share
JINR	6%
Germany	10%
Belgium	6%
INFN	32%
CERN	20%
US	4%
Mexico	2%
Bulgaria	4%
UK	10%
INR/IHEP	6%
<b>TOTAL</b>	<b>100%</b>

A partial list of the main items payable from the MOF include:

**Detector related cost:** Magnet  
 Gas  
 Cooling  
 Safety  
 Technical Support  
 LKR Cryogenic Controls  
 DCS Support

**Secretariat**

**Computing** Tier 0 services  
 Maintenance  
 Licences  
 System Management

**General Services** Cooling, Ventilation, Distribution  
 Transport  
 Survey

**Annex 9 Deliverables to be provided by the Institutes, their estimated total value and the sharing among Institutes**

<b>1. Beam Line</b>	<b>CERN</b>	
<b>Item</b>	<b>Cost (kCHF)</b>	
Magnets	250	
Cabling and Services	150	
Vacuum and Instrumentation	200	
<b>Total</b>	<b>600</b>	
<b>2. CEDAR</b>	<b>UK</b>	
<b>Item</b>	<b>Cost (kCHF)</b>	
Mechanics	200	
Gas and Installation	70	
Photo-detectors	80	
Electronics & Cabling	150	
<b>Total</b>	<b>500</b>	
<b>3. Gigatracker</b>	<b>INFN/CERN/Belgium</b>	
<b>Item</b>	<b>Cost (kCHF)</b>	<b>Sharing among Institutes (kCHF)</b>
Sensors and Bump Bonding	400	INFN (100), CERN (300)
Read-out chip (0.13 $\mu$ m CMOS)	1500	INFN (600), CERN (900)
Interconnect and Back-end	500	INFN (500)
Power Supplies and cabling	100	CERN
Cooling, Mechanics, Cont.	500	INFN (100), Belgium (400)
<b>Total</b>	<b>3000</b>	

<b>4. Straw Tracker</b>		
	<b>CERN/JINR</b>	
<b>Item</b>	<b>Cost (kCHF)</b>	<b>Sharing among Institutes (kCHF)</b>
Straw Production	400	JINR (350), CERN (50)
Frames, Webs & Cabling	800	JINR (550), CERN (250)
Front End & R/O Electronics	650	JINR (450), CERN (200)
Power Supplies	150	JINR (150)
Gas and Cooling Systems	100	CERN (100)
<b>Total</b>	<b>2100</b>	

<b>5. RICH</b>		
	<b>INFN/CERN/MEXICO/US</b>	
<b>Item</b>	<b>Cost (kCHF)</b>	<b>Sharing among Institutes (kCHF)</b>
Vessel, Insulation and Probes		CERN – Under Infrastructure
Gas System / Re-circulator		CERN – Under Infrastructure
Mirrors and accessories	460	INFN
Photomultipliers	980	INFN (780), ME/US (200)
HV System	480	INFN
Electronics and Cabling	380	INFN
<b>Total</b>	<b>2300</b>	

<b>6. Photon Vetoes</b>		
	<b>INFN/Japan/Bulgaria</b>	
<b>Item</b>	<b>Cost (kCHF)</b>	
Opal Lead-Glass (in kind)	3800	Japan
Mechanics and Cabling & FE	2100	INFN
ANTI Extensions	400	INFN
High Voltage	300	INFN
SAC / IRC	200	Bulgaria
ANTI 0	10	INFN
<b>Total</b>	<b>6900</b>	

<b>7. Liquid Krypton Calorimeter</b>		
<b>Item</b>	<b>INFN / CERN</b>	
	<b>Cost (kCHF)</b>	
CARE Modules	700	CERN
Power Supplies	500	CERN
ZS FARM	500	CERN
<b>Total</b>	<b>1700</b>	

INFN is responsible for existing Front/End Electronics and it is committed to provide the expertise to maintain it in working condition.

**8. Muon Veto Detector (MUV) and Charged Hodoscope (CHOD) Germany/INR/IHEP**

<b>Item</b>	<b>Cost (kCHF)</b>	
Fast Muon Plane	300	IHEP (160), INR (80), Germany (60)
MUV1 Detector	700	Germany (580), IHEP (120)
SP12 Magnet or eq.	800	IHEP (620), INR (180)
CHOD	200	IHEP (60), INR (80), Germany (60)
<b>Total</b>	<b>2000</b>	

<b>9. TDAQ</b>		
<b>Item</b>	<b>Germany/INFN</b>	
	<b>Cost (kCHF)</b>	
Trigger Supervisor	200	INFN
Level 0	800	INFN
HLT (PC farm)	400	Germany
LINK	500	INFN
<b>Total</b>	<b>1900</b>	

<b>10. Computing</b>		
<b>Item</b>	<b>INFN/UK/Belgium/Mexico</b>	
	<b>Cost (kCHF)</b>	<b>Sharing among Institutes (kCHF)</b>
Tier1/Tier2 Resources	3100	INFN (400), UK (1700), Belgium (800), Mexico (200)
<b>Total</b>	<b>3100</b>	

## NA62 Experiment

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### 11. Infrastructure & DCS

CERN

Item	Cost (kCHF)
DCS	100
Vacuum system	1300
RICH vessel+gas system	600
<b>Total</b>	<b>2000</b>

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**Grand Total (kCHF) 26100**





**Annex 10**

**ORGANISATION EUROPÉENNE POUR LA RECHERCHE NUCLÉAIRE  
EUROPEAN ORGANIZATION FOR NUCLEAR RESEARCH**

Laboratoire Européen pour la Physique des Particules  
European Laboratory for Particle Physics

**GENERAL CONDITIONS**

**APPLICABLE TO**

**EXPERIMENTS AT CERN**

20 February 2008

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## **GENERAL CONDITIONS**

*applicable to*

*Experiments at CERN*

*(Terms with a particular meaning in the context of this document are defined at the end – their first occurrence in the document is indicated with a reference number thus: term<sup>n</sup>).*

The mission of the European Organization for Nuclear Research (“*CERN*”) is to sponsor international scientific research in high-energy physics.

This document (the “*General Conditions*”) sets out the rules and procedures in organisational, managerial and financial matters, which apply to the participation by Universities and Research Institutions (the “*Collaborating Institution(s)*”) in experiments at CERN. The Collaborating Institutions jointly constitute the “*Collaboration*”. They provide, and are responsible for, the Visiting Research Teams<sup>i</sup> (the “*Team(s)*”) carrying out the experiment.

The General Conditions also define CERN's role as Host Laboratory of the experiment, which must be distinguished from its role as a Collaborating Institution, as the case may be.

Any reference made in the General Conditions to a specific document shall be to its most recent version.

### **1. SCOPE OF APPLICATION**

The General Conditions apply to Approved Experiments<sup>ii</sup> (the “*Experiment(s)*”) carried out on the CERN site<sup>iii</sup>. They do not apply to Recognised Experiments<sup>iv</sup>.

### **2. PARTIES AND THEIR REPRESENTATION**

2.1. The parties involved in the Experiment (the “*Party*” or the “*Parties*”) are:

- CERN as Host Laboratory;
- The Collaborating Institutions (including, as the case may be, CERN).

2.2. Each Party shall have a representative:

- CERN as Host Laboratory shall be represented by its Director of Research, acting on behalf of the Director-General;
- The Collaboration shall appoint a Spokesperson, who shall represent the Collaboration to the outside, including to CERN as Host Laboratory, and co-ordinate its work. Where

the Spokesperson is not stationed full-time at CERN, the Collaboration shall also appoint a Contactperson at CERN;

- Each Collaborating Institution shall appoint a Team Leader who shall represent it in its relations with CERN as Host Laboratory. The Team Leader's responsibilities are detailed in the "Appointment of Team Leader" form (available on the Users' Office Web site – see Article 5.7).
- 2.3. Each Collaborating Institution shall ensure that the members of its Team (the "*Team Member(s)*") comply with the General Conditions.

### 3. BASIC DOCUMENTS GOVERNING THE EXECUTION OF THE EXPERIMENT

3.1. The following documents shall constitute the formal basis for the Experiment:

- 3.1.1. the **EXPERIMENTAL PROPOSAL**, after its approval by the CERN Research Board on the recommendation of the Experiment Committee dealing with the appropriate part of the physics programme (the "*Experiment Committee*");
- 3.1.2. the **TECHNICAL DESIGN REPORTS**, where appropriate;
- 3.1.3. the **MEMORANDUM OF UNDERSTANDING** (the "*MoU*"), which sets out the detailed arrangements specific to the Experiment and which shall be agreed and signed by CERN as Host Laboratory and the Collaborating Institutions, for the purpose of signature represented, as the case may be, by their Funding Agencies<sup>v</sup>. Through the signature of the MoU, the Collaborating Institutions accept its terms;
- 3.1.4. the **GENERAL CONDITIONS**.

#### Contents of the MoU

- 3.2. The MoU may be a single document setting out the arrangements for construction, installation, maintenance and operation, or it may comprise two documents, one for construction and installation and the other for maintenance and operation. As a guide, the essential parts of the MoU are the following:
- a) a list of the Collaborating Institutions responsible for the Teams carrying out the Experiment;
  - b) a list of the Funding Agencies of the Collaboration;
  - c) details of the persons with specific responsibilities in the Experiment;
  - d) the obligations of the Parties for:
    - i) construction and installation
      - the obligations for construction and installation of the detector components and the auxiliary equipment (jointly the "*Equipment*");
      - a breakdown of the funding requirements for the Equipment, together with the contributions of the Parties;

- a timetable for the construction and installation of the Equipment;
- ii) maintenance and operation
  - the obligations for maintenance and operation of the Equipment;
- e) an explicit statement that the General Conditions apply;
- f) references to any specific agreements and Protocols relevant to the Experiment, copies of which shall be included as Appendices to the MoU.

#### **4. ORGANISATION OF THE COLLABORATION**

##### **Internal autonomy and co-ordination with CERN as Host Laboratory**

- 4.1. In its internal relations, the Collaboration shall be free to take such organisational decisions as deemed necessary, always subject to the terms of the MoU and the General Conditions. Any financial arrangements between CERN as Host Laboratory and the Collaboration shall be subject to the Financial and Administrative Provisions for Visiting Research Teams.

##### **Co-ordination in matters of safety**

- 4.2. The Leader of the CERN Department responsible for the physics programme of which the Experiment is part shall appoint a Group Leader in Matters of Safety (GLIMOS), on the proposal of the Spokesperson. The rights and responsibilities of the GLIMOS are defined in the document "Safety Policy at CERN - SAPOCO/42".

##### **Finance Review Committee/Resources Review Board**

###### **Initial Decision**

- 4.3. For Experiments involving large capital investments, a Finance Review Committee (FRC) or a Resources Review Board (RRB) may be set up by agreement of CERN as Host Laboratory and the Collaboration.

###### **Membership**

- 4.4. The FRC/RRB shall consist of one representative of each Funding Agency, along with the Managements of CERN and the Collaboration. It shall be chaired by the CERN Director of Research.

###### **Terms of reference**

- 4.5. The role of the FRC/RRB includes:
- reaching agreement on the MoU;
  - approving any modification of, or addition to, the Experiment that would require amending the MoU;
  - monitoring the supply of Equipment according to the agreed schedule;

- monitoring the Common Projects<sup>vi</sup> and the use of the Common Funds<sup>vii</sup>;
  - monitoring the general financial and manpower support;
  - approving a maintenance and operation procedure and monitoring its functioning;
  - approving the annual construction and installation budgets as well as those for maintenance and operation.
- 4.6. The Collaboration Management reports to the FRC/RRB on technical, managerial, financial and administrative matters, and on the composition of the Collaboration.

## 5. CERN'S OBLIGATIONS AS HOST LABORATORY

### PRINCIPLES

#### Installation

- 5.1. The Collaboration shall ensure that the Equipment and counting rooms meet the CERN Safety Rules. Provided that this is the case, CERN shall agree in writing to their installation in the appropriate experimental area.

#### Duration

- 5.2. CERN shall agree to keep the Equipment on-site during the data-taking for the experimental programme approved by the CERN Research Board.

#### Network connections

- 5.3. CERN shall agree that computers and peripherals belonging to the Collaboration, which are needed for the operation of the Equipment, may be connected to the CERN computer network, provided they meet its compatibility and security standards, including as set out in the document "Operational Circular No 5 – Use of CERN Computing Facilities" and subsidiary rules.

#### Insurance

##### - *Property*

- 5.4. CERN shall at its expense insure against the risks of fire, explosion, natural disaster and water damage all items belonging to the Collaboration or a Collaborating Institution, once they have been delivered to the CERN site, added to the Ownership Inventory (Article 6.10) and accepted in writing by CERN. CERN shall not insure such items against the risks of transport, crane or rigging accidents. It may however offer the possibility that such insurance is taken out at the expense of the Collaborating Institution(s) concerned.

##### - *Third party liability*

- 5.5. CERN shall at its expense insure the members of the Collaborating Institutions against third party liability incurred by them at CERN in the execution of the Experiment.

### *- Limitation of coverage*

- 5.6. The insurance covers defined in Articles 5.4 and 5.5 are subject to the provisions, including the specified deductibles, exclusions and limits, of CERN's insurance policies. Any risk or amount not covered by such policies shall be for the exclusive account of the Collaboration. CERN does not warrant or accept liability as to the sufficiency of its insurance policies in relation to the risks incurred by the Collaboration.

## **SERVICES**

### **User support, Users' Office and ACCU**

- 5.7. CERN operates a Users' Office as a point of contact with the user community. Documentation for users is maintained on the Users' Office Web site, which can be accessed through the CERN home page (<http://www.cern.ch>). CERN shall provide access to its services, as described in the "CERN Guide for Newcomers" (available from the Users' Office Web site). The Users' Office provides assistance on questions concerning access to the services provided by CERN.

The Advisory Committee of CERN Users (ACCU) promotes links between CERN Management and the User Community and advises CERN Users on the working conditions and the arrangements for technical support.

### **Standard services and facilities**

- 5.8. CERN normally provides, free of charge and within the limits and constraints imposed by the available resources and schedules of accelerators, the following standard services and facilities for the duration of the Experiment:

#### *Particle beams and equipment*

- a) particle beams and related shielding, monitoring equipment and standard communication with the accelerator control rooms;
- b) beam time allocation and scheduling, in accordance with the recommendations of the Experiment Committee;
- c) test-beam time for testing prototypes and calibrating final detector components, subject to the applicable scheduling and allocation procedures;

#### *Space*

- d) floor space in the experimental area(s) for the Equipment;
- e) laboratory and hall space for construction, testing and assembly of the Equipment;
- f) temporary short-term storage space for spare parts, handling and assembly tools and Equipment that is awaiting installation or removal. CERN reserves the right to charge the cost of longer-term storage of the above items to the Collaborating Institution(s) concerned;

- g) office space, equipped with standard furniture and infrastructure facilities including network connections, telephones and electricity;

### ***Supplies and installations at the Experiment***

- h) assistance with the installation and removal of the Equipment, such as the provision of crane and rigging services, geometrical survey and alignment, as well as transport of the Equipment on and between the parts of the CERN site and inside the experimental areas;
- i) mechanical infrastructure, local infrastructure for the supply of mains electricity, raw cooling water, compressed air and standard connections to the CERN communication network;

### ***Computing***

- j) central computing resources for the Collaboration, in amounts to be decided in accordance with the applicable CERN allocation procedures;

### ***Transport of persons***

- k) basic transportation for personnel between the main parts of the CERN site, including the experimental areas;

### ***Safety services***

- l) access to its safety services for advice, inspection and verification, and first aid or other emergency help;

### ***Administrative services***

- m) access to its administrative services to assist the Collaboration in financial matters, in accordance with the Financial Rules and the Financial and Administrative Provisions for Visiting Research Teams;

### ***Purchasing services***

- n) access to its purchasing services to assist the Collaboration in placing purchase orders and contracts for its account, in accordance with the CERN Financial Rules and the CERN Purchasing Procedures. In such cases there is immediate automatic transfer of ownership to the Collaborating Institution(s) for which the purchase is made. This(These) Institution(s) shall hold CERN free and harmless from liability arising from such assistance;

### ***Maintenance and operation***

- o) the resources needed to operate and maintain the standard infrastructure and other equipment supplied by CERN as Host Laboratory.



### **Special services**

- 5.9. A variety of services other than those specified above may be provided to the Collaboration on request, subject to the availability of resources. Such services shall be charged according to the applicable conditions.

### **Special equipment**

- 5.10. Any additional infrastructure equipment to be provided by CERN, as well as the obligations of CERN and the Collaborating Institutions with regard to the construction, installation, maintenance and operation of such equipment, shall be explicitly mentioned in the MoU.

## **6. OBLIGATIONS OF THE COLLABORATING INSTITUTIONS**

### **Basic obligations**

- 6.1. In their capacity as members of the personnel of CERN<sup>viii</sup>, the Team Members shall be subject to the authority of the Director-General of CERN and shall comply with the rules and regulations in force at CERN. Items brought onto the site by the Collaboration are subject to the rules and regulations in force at CERN.

### **Status of personnel**

- 6.2. Each Collaborating Institution shall ensure that its Team Members shall for the duration of their Contract of Association<sup>ix</sup> with CERN (the “*Contract of Association*”) remain employed by, and receive a salary from, their Collaborating Institution. It is understood that where they are students, the Team Members shall remain enrolled at their Collaborating Institution, and where they have a sponsor, they shall remain under contract with, and continue to be financed by, their sponsor.
- 6.3. Each Collaborating Institution shall ensure the provision of adequate social and third party liability insurance cover to its Team Members and the members of their family accompanying them. The social insurance must include cover against the financial consequences of illness and accidents that is adequate in the Host States of CERN for the duration of the Contract of Association.
- 6.4. Each Collaborating Institution shall be liable to CERN for any cost or expense resulting from the situation where its Team Members have insufficient insurance cover.

### **Medical surveillance and certificates**

- 6.5. Each Collaborating Institution shall remain responsible for the medical surveillance of its Team Members and, in the case of Team Members who are to work in conditions which are deemed to pose special risks (e.g. radiation controlled areas), shall supply to the CERN Medical Service a certificate of medical fitness, for the first time on registration of the Team Member at CERN and then every two years thereafter (a form for such certificates is available on the Users’ Office Web site – Article 5.7).

### **Safety briefings and inspections**

- 6.6. The Collaborating Institutions, in conjunction with the CERN Department responsible for the physics programme of which the Experiment is part, shall ensure the safety of the Team Members and the Equipment. The Collaborating Institutions shall participate in safety meetings and studies of the Experiment. They shall ensure compliance by the Team Members with the CERN Safety Rules.

Each Team Member has specific safety responsibilities and obligations, as defined in the document "Safety Policy at CERN - SAPOCO/42". The Team Members shall attend the CERN safety course(s) for newcomers, any compulsory CERN safety course, and all specific safety courses deemed necessary by the Collaboration.

The CERN safety personnel shall be entitled to carry out safety visits, checks and inspections as well as other safety measures set out in the document "Safety Policy at CERN - SAPOCO/42".

### **Supply of Equipment**

- 6.7. The Collaborating Institutions shall make available on the CERN site, according to an agreed timetable and in working order, the Equipment that they have undertaken to supply and commission. The Spokesperson shall promptly inform the CERN Director of Research of any material failure to meet the agreed schedule. For experiments with an FRC/RRB, this body shall monitor such matters.

### **Transport, installation and dismantling of Equipment**

- 6.8. Each Collaborating Institution supplying Equipment shall be responsible for its delivery to and removal from the CERN site, always in compliance with applicable export laws and restrictions. All such Equipment shall be properly documented to indicate its ownership status (Article 6.10) handling requirements and any potential hazards that it may pose. The Collaborating Institutions shall be collectively responsible for the installation and dismantling of the Equipment.

### **Ownership of Equipment**

- 6.9. Except as may be agreed in writing by the owner and CERN as Host Laboratory, the delivery of Equipment to the CERN site or its handling on the CERN site shall not affect its ownership. The owner and CERN as Host Laboratory may agree in writing to transfer to CERN the ownership of Equipment which is no longer required by the Collaboration.

### **Ownership inventory**

- 6.10. As a condition of coverage by CERN's insurance policy, the Collaboration shall provide CERN with a list of the Equipment which it brings on the CERN site, specifying for each item the owning Collaborating Institution(s) or joint ownership by the Collaboration. It shall keep the list up-to-date and inform CERN promptly of any modifications.

### **Maintenance and operation of Equipment**

- 6.11. The Collaborating Institutions shall be collectively responsible for the maintenance and operation of the Equipment, and for providing the resources necessary to carry out the experimental programme.

### **Assignment of Equipment**

- 6.12. Any Collaborating Institution providing Equipment shall continue to make it available to the Collaboration until the Experiment has been declared completed (Article 8.2).

### **Early removal of Equipment**

- 6.13. The Collaboration may request the removal from the CERN site under the responsibility of the owning Collaborating Institution(s) of any Equipment which in the opinion of the Collaboration is no longer required for the Experiment.

### **Release of space**

- 6.14. Space allocated for construction and assembly shall be released when these activities have terminated. As Host Laboratory, CERN reserves the right to change the space allocation during the lifetime of the Experiment. As soon as the Experiment has been declared completed (Article 8.2), all space used by the Collaboration, including office and laboratory space, and the space used for testing and running the Experiment, shall be made available to CERN for reallocation.

### **Removal of Equipment**

- 6.15. Equipment shall be removed from the CERN site under the responsibility of the owning Collaborating Institution(s) within six months following a request from the Leader of the CERN Department responsible for the physics programme of which the Experiment is part.
- 6.16. The dismantling and removal of the Equipment must respect the CERN Safety Rules and the laws of the countries through which the dismantled Equipment will transit during the removal, including the country of its final destination (e.g. transport, disposal, elimination of special or radioactive waste). Except as may be agreed in writing by the Collaboration and CERN, the associated costs shall be borne by the Collaboration.

## **7. INTELLECTUAL PROPERTY**

### **Publication and use of data and knowledge**

- 7.1. CERN is bound by its Convention to publish or otherwise make generally available the results of its experimental and theoretical work.
- 7.2. The Collaborating Institutions shall strive to publish any data and knowledge resulting from the experiment through Open Access<sup>x</sup> journals. Where the copyright in an article shall be transferred to the publisher, each Collaborating Institution shall ensure that it has the necessary internal authorisations to approve such a transfer.

- 7.3. Subject to Articles 7.4 and 7.5, each Collaborating Institution and CERN as Host Laboratory shall be entitled to use any data and knowledge resulting from the Experiment for its own scientific non-military purposes.

### **Contribution of proprietary information**

- 7.4. A Collaborating Institution contributing proprietary information to the Collaboration shall ensure that it has or has procured the rights to use, and to contribute to the Collaboration for use by the other Collaborating Institutions, such proprietary information for the execution of the Experiment. The term “use” shall include any integration, modification, enhancement and redistribution. Where the use of proprietary information is subject to restrictions, the contributing Collaborating Institution shall disclose them in writing when making its contribution available to the Collaboration. The obligations defined in this article shall apply whether or not the proprietary information is pre-existing or developed in the execution of the Experiment, and whether or not it was developed individually or jointly with one or more other institution(s).

### **Use of proprietary information**

- 7.5. The contribution by a Collaborating Institution of any proprietary information, including information protected by trademark, patent or copyright, shall not create any right in respect of such information for the other Collaborating Institutions, other than a free, irrevocable and non-exclusive licence to use such information in the execution of the Experiment.

### **Publication and disclosure of proprietary information**

- 7.6. Subject to the intellectual property rights of the Collaborating Institutions having contributed the proprietary information and taking into account any potential for commercial exploitation, the Collaborating Institutions shall strive to publish and make publicly available all proprietary information contributed to the Collaboration. In particular, they shall consider making any software available under Open Source licence conditions.

### **Limitation of liability**

- 7.7. The Collaborating Institutions provide no warranties or representations of any kind to each other.

Each Collaborating Institution shall use the data and knowledge resulting from the Experiment and the proprietary information contributed to the Collaboration at its own risk.

The Collaborating Institutions shall have no liability to each other with respect to the subject matter of this Article 7.

## **8. FINAL PROVISIONS**

### **Modification of the Experiment and amendment to the MoU**

- 8.1. The Collaboration shall agree on any modification of or addition to the Experiment that would require amending the MoU and shall inform CERN as Host Laboratory of such changes. For experiments with an FRC/RRB, such changes shall also be approved by this body. Where the

changes constitute a substantial change to the Experiment, they shall be submitted to the Experiment Committee for approval by the CERN Research Board and the Director-General. Any amendment to the MoU shall be signed by the representatives of the parties to the MoU.

### **Duration of applicability of the MoU**

- 8.2. Unless another duration is specified in the MoU, the MoU shall remain in force until the CERN Director of Research, in agreement with the Spokesperson, has declared the Experiment completed, the Equipment has been dismantled and the arrangements for its disposal agreed in writing.
- 8.3. Notwithstanding the foregoing, the General Conditions shall remain in force.

### **Observance of the MoU and the General Conditions**

- 8.4. The MoU is not legally binding but the parties to the MoU recognise that the success of the Collaboration depends upon their adherence to its provisions. Any default under its provisions shall be dealt with, in the first instance, by the Collaboration in consultation with the CERN Management and if necessary then by the FRC/RRB (where such a body exists).
- 8.5. Notwithstanding the foregoing, the provisions of the General Conditions are binding.

### **Liability**

- 8.6. Except as specifically stipulated in the General Conditions, the Parties shall not be liable to each other for any loss or damage arising in connection with the Experiment.

### **Arbitration**

- 8.7. If a dispute within the Collaboration or between the Collaboration and CERN as Host Laboratory cannot be resolved amicably, it shall be referred by any party to the dispute for arbitration to the President of the CERN Council, whose decision shall be binding and final, without right of revision or appeal.

### **Relevant documents**

- 8.8. The following documents apply to the execution of the MoU:
  - the CERN Guide for Newcomers;
  - Financial and Administrative Provisions for Visiting Research Teams;
  - Use of CERN Computing Facilities - Operational Circular No 5 (<http://cern.ch/ComputingRules/>);
  - the Safety Guide for experiments at CERN (<http://cern.ch/SafetyGuide/>);
  - the Safety Policy at CERN - SAPOCO/42;
  - Purchasing Rules and Procedures for Experiments at CERN

## 9. Definitions

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- i **Visiting Research Team:** A Collaborating Institution's personnel involved in the Experiment.
- ii **Approved Experiment:** An Experiment approved by the CERN Research Board and the Director-General after consideration of a written proposal submitted to the appropriate Experiment Committee, taking into account scientific interest, technical feasibility and the constraints imposed by available resources.
- iii **CERN site:** All parts of CERN's fenced-in domain and all of its underground works.
- iv **Recognised Experiment:** An experiment in fields allied to particle physics, such as astroparticle physics, the full definition of which was decided by the CERN Research Board (CERN/DG/RB 99-285). The conditions applicable to such experiments are decided by the CERN Research Board on a case-by-case basis.
- v **Funding Agency:** A body providing resources to one or more of the Collaborating Institutions for the purpose of participation in the Experiment. A Collaborating Institution may itself be a Funding Agency.
- vi **Common Project:** A project that the Collaboration has decided to manage jointly under the authority of the Collaboration Management.
- vii **Common Funds:** Funds contributed by the Funding Agencies to joint accounts administered by the Collaboration Management.
- viii **Member of the personnel of CERN:** All Team Members who are not employed by CERN are required to sign a Registration Form, in which they apply to become an associated member of the personnel of CERN.
- ix **Contract of Association:** The contract defined in Article RI 2.04 of the Staff Rules and Regulations of CERN.
- x **Open Access:** The free, irrevocable, worldwide right of access to, and use of, a work in any digital medium for lawful purposes, subject to proper attribution of authorship.