ISIEC – INITIAL SAFETY INFORMATION ON EXPERIMENTS AT CERN

PURPOSE OF THIS TEMPLATE

This document shall be completed by the GLIMOS of an experimental collaboration, whenever it intends to bring new experimental apparatus, new test beams or make major modifications to experimental apparatus already operating at CERN.

The purpose of this document is to provide a summary description of the equipment that is to be brought to CERN and the activities that are to be carried out. This document will then allow the PH Safety Office (PH-SO) to perform an initial safety assessment; i.e. identification of the applicable safety requirements, control measures, etc.

This ISIEC document will serve as a basis for the safety information on an experiment. Further documentation may be requested to improve the understanding of safety hazards.

For each experimental apparatus, the following procedure applies:

1- The GLIMOS shall fill in chapters 1 to 4.

2- The GLIMOS shall submit this document (ISIEC form) to the PH Unit sps.coordinator@cern.ch and dso-ph@cern.ch

3- Recommendations and procedures will follow after the provision of this document. Note that if the experiment is considered to have major safety implications then the CERN HSE unit will become involved and their safety procedures will then be followed.

4- A Launch Safety Discussion may be called for by the PH-SO. This will take place on site with representatives of the experiment, PH-SO, the HSE Unit and other CERN Departments.

5- A formal 'Safety Clearance' of the experiment must be given prior to the experiment being allowed to start operating (for example to receive beam).

Please note that this form must be completed and sent to CERN prior to the arrival of the planned experiment. Work will not be allowed to start until this form, and any requested complementary information on safety hazards, has been completed and handed over as explained above.

Please complete the following:

NAME OF THE EXPERIMENT: **NA58(RICH)**

Filled out by: **Gerhard Mallot**

Date: **05.08.2014**

1 INTRODUCTION

The purpose of this document is to provide a description of the experimental program/test beam to be carried out at CERN; i.e.:

- to identify the equipment brought to CERN;
- to identify activities to be carried out at CERN;
- toidentify hazards associated to the equipment and activities and the measures to be implemented in order to eliminate, control or mitigate them.

Please enter the information in the empty cells of the tables below:

1.1 Organization of the Collaboration

Role	Name	Phone/e-mail
Spokesperson	Andrea Bressan - Fabienne Kunne	Andrea.Bressan@cern.ch
Technical coordinator	Johannes Bernhard	Johannes.Bernhard@cern.ch
GLIMOS	Gerhard Mallot	Gerhard.Mallot@cern.ch
SPS Coordinator	Henric Wilkens	16-3845 spsco@cern.ch
DSO-PH	Mark Hatch	dso-ph@cern.ch
Liaison Physicist	Lau Gatignon	Lau.Gatignon@cern.ch
TSO		
Responsible for NA58(RICH) Test-Beam	Fulvio Tessarotto	16 -4826 Fulvio.Tessarotto@cern.ch
Contact person for NA58(RICH) Test-Beam	Stefano Levorato	16 -4850 Stefano.Levorato@cern.ch

1.2 Schedule and location of the experimental apparatus or test beam

Start date:	26.08.2014
Completion date:	16.09.2014
Building/experimental area	Bd. 157
Beam line/PPE door	T10
Lab/Counting room/Phone	

2 DESCRIPTION OF THE EXPERIMENTAL APPARATUS/TEST BEAM

2.1 General description of the experimental apparatus/test beam

Please type a description of the experimental apparatus/test beam and the associated equipment. In order to enable an understanding the layout, add pictures and diagrams whenever possible:

The NA58(RICH) Photon Detector System has a total size of 2 m (h)x 2 m (w) x 2.5 m (l) and consists in a support structure hosting two Photon Detector Chambers of 0.6 m x 0.6 m x 0.2 m, equipped with electronic boards, HV distribution boxes and fused silica radiator systems, a trigger system of 5 PM's on remotely controlled movable supports, and a set of measuring devices around the Chambers.

A table and two racks hosting control PC, r/o electronics, HV supply, LV supply and cooling systems are placed near the Detector System inside the area.

The NA58(RICH) Photon Detector System uses two gas connection lines: one for flammable gas (Ar/CH4 mixture) and one for inert gas (N2) and a total of 6 power lines (220 V, 16 A)

Two racks hosting the trigger electronics and acquisition system are located inside the Barrack; they are connected to the Detector System via dedicated Ethernet cables, standard signal cables and optical fibres; three nearby PC's + accessories are used by operators during data taking.

2.2 Description of the installation

Complete the cells below and double click on the boxes and check as appropriate.

Equipment	Availability	Design and manufacturing
Gas mixing and distribution system	☒ Existing	☒ To be used without any modification ☐ To be modified
	☐ New	☐ Standard equipment supplied by a manufacturer ☐ CERN/collaboration responsible for the design and/or manufacturing
NA58(RICH) Detector System	☐ Existing	☐ To be used without any modification ☐ To be modified
	☒ New	☐ Standard equipment supplied by a manufacturer ☒ CERN/collaboration responsible for the design and/or manufacturing
NA58(RICH) DAQ	☐ Existing	☐ To be used without any modification ☐ To be modified
	☒ New	☐ Standard equipment supplied by a manufacturer ☒ CERN/collaboration responsible for the design and/or manufacturing

2.3 Hazards generated by the experimental apparatus/test beam

Identify the hazards associated to each part of the experiment and the associated equipment that is to be integrated in the experimental apparatus/test beam. Double click on the boxes and check as appropriate. Provide comments or values under the description.

Domain	Hazards/Hazardous Activities		Description
Mechanical Safety	Pressure	☐	20 [mbar] maximum overpressure; 60 l
	Vacuum	☐	no
	Lifting equipment	☐	Crane used by CERN personnel for installation and dismounting operations
	Machinery / Machine Tools	☐	no
	Mechanical energy (moving parts)	☐	Small trigger counters, 10 cm excursion movement
	Mechanical properties (sharp, rough, slippery)	☐	no
	Industrial Vehicles	☐	no
	Hot Work (e.g. welding, grinding)	☐	no
	Hot/cold surfaces	☐	Electronic cards
	Vibration	☐	Fan units and cooling

			system pump
Cryogenic Safety	Cryogenic fluid	☐	no
Structural Safety	Shielding Walls	☐	no
	Specific actions/conditions	☐	no
Electrical and Electro-magnetic Safety	Electrical equipment and installations	☐	220 V, 6 X 16 A
	High Voltage Equipment	☐	8000 V, 0.001 mA
	Magnetic field	☐	no
	Equipment in potentially explosive atmospheres	☐	Photon Detector Chambers
Chemical Safety	Hazardous chemical agent (HCA)	☐	CH4
	CMR (carcinogens, mutagens and substances toxic to reproduction)	☐	no
	Toxic/Harmful	☐	no
	Corrosive	☐	no
	Oxidizing	☐	no
	Flammable	☐	CH4, 60 l
	Potentially explosive atmospheres	☐	CH4, 60 l
	Irritant	☐	no
	Asphyxiant	☐	no
	Nanomaterial's	☐	no
	Dangerous for the Environment	☐	no
	Asbestos	☐	no
Biological Safety	Legionella	☐	no
	Biological Agents	☐	no
Non-ionizing radiation Safety	Laser, class	☐	no
	Radiofrequency	☐	no
	Microwaves	☐	no
	UV light	☐	no
	Electromagnetic (Frequency & Field strength)	☐	no
Workplace	Excessive Noise	☐	no
	Temperature constraints (non-comfortable)	☐	no
	Insufficient Lighting	☐	no
	Indoor Air quality (e.g. clean rooms)	☐	no
	Confined space	☐	no

	Work at height	☐	no
	Obstructions in passageways	☐	no
	Lone working	☐	no
	Falling objects	☐	no
	Internal Traffic (e.g workshops, experiments)	☐	no
	Slippery/unstable ground	☐	no
	Working outside normal working hours	☐	Data taking shifts
Environment	Usage/storage of potentially polluting substances (gases, liquids, solids)	☐	no
	Emissions of substances into the atmosphere	☐	no
	Discharge of effluents to the site drainage (i.e. infiltration water, rain water, cooling water…)	☐	no
	Discharge of effluents to sewage (i.e. sanitary water…)	☐	no
	Activated or radioactive soil	☐	no
	Polluted or contaminated soil	☐	no
	Emission of noise harmful for the environment	☐	no
	Vibrations harmful for the environment	☐	no
	Odours	☐	no
	Waste generation	☐	no
	Significant consumption of resources (e.g. water, electricity gas, fuels, ...)	☐	CH4, 30 l/h
Worksite	Construction & dismantling activities	☐	no
	Co-activity	☐	no
Fire Safety	Hot works	☐	no
	Combustible Materials	☐	no
	Ignition sources	☐	no
Ionizing Radiation	Target material	☐	Fused silica
	Beam particle type	☐	pions
	Beam intensity	☐	< 100 kHz
	Beam energy	☐	5 GeV
	Source		no

Include below a table of any other hazards that may be present – if applicable.

3 DESCRIPTION OF THE ACTIVITIES CARRIED OUT AT CERN

3.1 Description of installation activities

*Please type below a description, with explanations as necessary, to provide an understanding of the **installation** activities, i.e.: handling procedures, handling equipment needs (mobile cranes...):*

The installation of the NA58(RICH) Photon Detector System and racks will be performed by use of the local crane operated by crane people; most of the connections and cabling will be done before installation, external connections and safety protections will be set at installation and will not be subject to changes until dismounting of the System.

The Detector will be supplied by the existing gas mixing rack and connection lines.

Gas connection will be performed on inert gas first, followed by leak rate measurement and flammable gas flow after authorization.

Complete purging of the detectors and the gas lines will be performed before dismounting.

Electrical equipment will be placed in safe positions, grounded and properly connected to the authorized power plugs only.

Switching on will be done after authorization.

No modification of the electrical scheme or opening of electrical equipment is foreseen before the dismounting of the NA58(RICH) Photon Detector System.

A scintillating fibre hodoscope will be calibrated by the Technical University of Munich downstream of the RICH setup, responsible Martin Losekamm (Group of Prof. Stephan Paul).

3.2 Description of the operation

*Please type a description, with explanations as necessary, to provide an understanding of the **operation** of the experimental apparatus.*

The Detectors will be operated by remote control of LV, HV and trigger counters movement. No opening of the detectors or changes in the system is foreseen during the data taking period.

Two read-out systems (analogue a digital) will be used; a change of electronics is planned, consisting in the dismounting of the front-end boards from one Chamber and mounting of the front-end boards on the other Chamber.

3.3 Description of the maintenance

*Please type a description, with explanations as necessary, to provide an understanding of the **maintenance** activities related to the experiment/ equipment.*

Periodic access to the readout boards and intervention in case of failures or problems are the only foreseen operations. In case of major problems a Chamber can be purged, removed from the System and carried to the COMPASS Laboratory for repair.

4 SAFETY ASSESSMENT

For the key identified hazards of an experimental apparatus and activity, measures shall be taken in order to eliminate, control or mitigate them. The table below shall contain the list of the key hazards and the measures that are to be implemented.

Key hazards identified	Location	Measures to be implemented
Fire, explosion (flammable gas)	Photon detectors	Leak rate measurement, max. flow limitation, flammable gas sensor installation, warning labels.
Electrical shock, sparks	Power suppliers, detectors	Certified equipment, safe positioning, electrical protections, safety elements and warnings, proper cabling and labelling, careful grounding, power disconnection before manipulation.
UV light exposure	Photon detectors	LEDs enclosed inside sealed detectors
Injury from moving parts	Trigger elements	Protections and warning elements
Injury from sharp edges	Support structure and frames	Plastic end-cups and rounded corners.

5 ROLES AND RESPONSABILITIES

5.1 GLIMOS

According to the § 5.4 of the Safety Policy at CERN (SAPOCO): *"For Safety matters, an experiment or test is represented by a Group Leader in Matters of Safety (GLIMOS), who is responsible for Safety, with the necessary authority, from the design stage and subsequently throughout the development, construction, and operational stages of the equipment until it is finally dismantled and correctly disposed of"*.

In the absence of an appointed GLIMOS, all his duties and responsibilities fall automatically on the Technical Coordinator or, if one does not exist, to the Spokesperson.

5.2 HSE Unit

According to the § IV of the Mandate of the Occupational Health & Safety and Environmental Protection Unit (HSE):

"*The HSE Unit provides Safety clearance for activities, special equipment, installations, experiments and projects with **major Safety implications** prior to design, operation or dismantling activities*".

For experiments less than 3 weeks duration, and if there are no major safety implications, then the PH-SO procedure will be followed (the ISIEC form and formal safety clearance by PH-SO).

5.3 TSO

According to the Safety Guide for experiments at CERN the task of Territorial Safety Officers is to watch over the safety of and in the region or building(s) under their responsibility, thereby ensuring that no part of the CERN site(s) escapes safety surveillance. However, the character of the various regions differs considerably, and consequently also the roles of the TSOs. We shall in this guide limit the considerations to those TSOs that are responsible for either experiment areas or buildings housing experiment support labs/workshops.

6 SAFETY CLEARANCE

The procedure for the safety clearance will depend on the type and duration of the experiment and whether or not there are major safety implications. In all cases a formal safety clearance is a requirement before an experiment can start operating

7 PS/SPS PHYSICS COORDINATOR

The PS/SPS physics coordinator establishes the AD/PS/SPS user schedules, represents the users at the different scientific and technical committees, being the contact person for both the accelerator groups and the experimental users. He also reports to the CERN management.

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ANNEX

Terms and abbreviations in English

CSHS	Special Health and Safety Committee
CSO	Cryogenic Safety Officer
CSOC	Cryogenic Safety Officers' Committee
DSO	Departmental Safety Officer
DSOC	Departmental Safety Officers' Committee
FGSO	Flammable Gas Safety Officer
FGSOC	Flammable Gas Safety Officers' Committee
GLIMOS	Group Leader In Matters Of Safety
HSE	Occupational Health & Safety and Environmental Protection Unit
PH-SO	Physics Department Safety Office
RSO	Radiation Safety Officer
SAPOCO	SAfety POlicy COmmittee
SLIMOS	Shift Leader In Matters Of Safety
TSO	Territorial Safety Officer