

Subject: Meeting Report - DarkSide Integration Group+ LNGS -
Date: 10/02/2022 - 11/02/2022.
Place: LNGS

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Meeting Report	10/02/22	0	M. Carlini	
		2	R. Tartaglia	

Participants	Institution	E-MAIL	Rif.
Chiara Meroni	INFN - G.E.	chiara.meroni@mi.infn.it	CM
Ezio Previtali	LNGS - Directorate	ezio.previtali@lngs.infn.it	EP
Marzio Nessi	CERN	marzio.nessi@cern.ch	MN
Johan Bremer	CERN	johan.bremer@cern.ch	JB
Francesco Pietropaolo	CERN	francesco.pietropaolo@cern.ch	FP
Antonio D'Addabbo	LNGS	antonio.daddabbo@lngs.infn.it	ADA
Paolo Gorla	LNGS	paolo.gorla@lngs.infn.it	PG
Carlo Bucci	LNGS	carlo.bucci@lngs.infn.it	CB
Serena D'Eramo	LNGS	serena.deramo@lngs.infn.it	SDE
Sandro De Cecco	Roma1	sandro.dececco@roma1.infn.it	SDC
Andrea Ianni	Princeton University	ianni@princeton.edu	AI
Federico Gabriele	INFN - CA	federico.gabriele@lngs.infn.it	FG
Marco Carlini	LNGS (+ CERN)	marco.carlini@cern.ch	MC
Antonio Di Ludovico	LNGS	antonio.diludovico@lngs.infn.it	ADL
Lidio Pietrofaccia	LNGS	lidio.pietrofaccia@lngs.infn.it	LP
Roberto Tartaglia	LNGS	roberto.tartaglia@lngs.infn.it	RT

#	Attachments	Authors / Ref.	Rif.
01	LNGS Cryogenic Recovery System	Antonio D'Addabbo	ADA
02	LNGS Preliminary Design	Antonio D'Addabbo	ADA
03	AAr DarkSide System§	Johan Bremer	JB
04	Management organization	Marzio Nessi	MN

10/02/2022 - CRYOSTAT AND GENERAL INSTALLATION

Participants:

Marzio Nessi, Johann Bremer, Francesco Pietropaoli, Sandro De Cecco, Federico Gabriele, Andrea Ianni, Marco Carlini, Roberto Tartaglia

MN:

- News from cryostat side: contract with GTT is out – bill of material for the cold cryostat expected for June/July so material arrival at LNGS is expected to happen at beginning of 2023
- Contracts for warm steel structure are going out in the next 2 weeks. This includes the contract for the beams procurement and the structure production and assembly. At the time the beams are delivered to the company, they have 3 months to produce the structure.

SDC: Critical to define the structure to support the cryogenics. **Marzio:** an internal review is needed before going out for tendering and authorization procedure. Seismic analysis is needed.

MN e RT

It's important to define as soon as possible the final configuration in the Hall C, which means that's important to understand and freeze the position of the cryostat and of the relative concrete basement.

It's really important to define the details for the so-called "cryogenics support structure", so that the professional engineers can proceed with the executive design to be submitted to the competent Authorities and to be used as basis for the needed tender (estimated cost of about 200.000 Euros).

MN:

- CAD library at CERN will be maintained

10/02/2022 - SURVEY UNDERGROUND

Participants:

Marzio Nessi, Johann Bremer, Francesco Pietropaoli, Federico Gabriele, Andrea Ianni, Antonio di Ludovico, Marco Carlini, Lidio Pietrofaccia, Roberto Tartaglia

Discussion on **detector installation inside the cryostat:** various options are discussed (removal of one of the main cranes, of two of the main cranes, use of a crane truck to be rented)

There is a proposal from Hanguo to reuse the DS-50 water tank roof to install the UAr condenser box and the DS-10 platform (currently in use by NEWS) to install the "Mockup cryostat". This is purely for mechanical and cryogenic testing. No physics is involved in this setup. The Collaboration will develop a doc explaining and specifying space requirements, activities to be performed, duration of these activities, safety constraints. The request will be discussed with the director in one of the weekly meeting.
(EP, LL, MN, RT). Need to freeze space requirement and duration of the work.

11/02/2022 - CRYOGENIC AND ORGANIZATION MEETING

Participants:

Antonio D'Addabbo, Serena D'Eramo, Carlo Bucci

Zoom: Paolo Gorla, Sandro De Cecco,

Chiara Meroni, Ezio Previtali joined the meeting at 11:00

Marzio Nessi, Johann Bremer, Francesco Pietropaoli, Federico Gabriele, Andrea Ianni, Antonio di Ludovico, Marco Carlini, Lidio Pietrofaccia, Roberto Tartaglia

** CRYOGENICS **

RT: the meeting has been organized between the LNGS cryogenic service and the DarkSide Collaboration in order to discuss the cryogenic installation and specs for DS-20k and to define the needed interface between the DS cryogenic system and Nitrogen recovery system under study at LNGS.

ADA shows the N₂ liquefaction system. Needs to receive numbers for interfaces. Delivery time 14 months + 6 months. An estimation time of about 6 months has to be accounted for the tender needed for purchasing the system. Right now a conservative estimation might be 30 months from February 2022 should be taken into account.

JB presents the AAr system needs for DS-20k.

MN expects a document to agree on the interfaces between the LNGS cryogenic group and the Collaboration.

ADA proposes that the collaboration provides the process plant parameters needed for the interface. The idea is to write down and agree about an interface document where all the details and the boundary limits between DarkSide and LNGS are defined and agreed.

** SCHEDULE/PLANNING **

FG shows the possible use of two software packages to update and share the schedule in the collaboration

SDC prefers the use of a free software

LP points out the importance to use software able to monitor and manage delays in the schedule itself.

ADL talks about other free software available on the market and compatible with windows and mac

MN points out that it is really important that everyone can import/export the information: the flexibility, the easiness in use and exchange information is essential.

** COURSES **

Safety courses are needed before the installation phase; possible subjects might be: confined environment, work at height, safety in the use of cryogenics, and so on..

** AOB **

The integration group should define in a short time the "final" position for the DarkSide Cryostat, in order to proceed with the concrete basement pouring and realization at the right time.

As regards the so-called "cryogenics support structure" there is a discussion on the idea to review the design in order to possibly use the equipped walkways on the East side of the Hall C: with this solution the design and realization if the structure is with no doubt less critical.

A discussion follows about the idea of reducing the Titanium Vessel dimensions, in order to fit with the access dimension in the Hall C (4,34 * 4,61 m are the dimensions of the Hall C door size). This solution would really simplify all the installation sequence and operation. In the next weeks there will be a focused discussion with Hanguo in order to check the "feasibility" and validity of such a solution.

As regards the "living costs" for the installation phase, a first estimation is of about 400 kEuro/year.