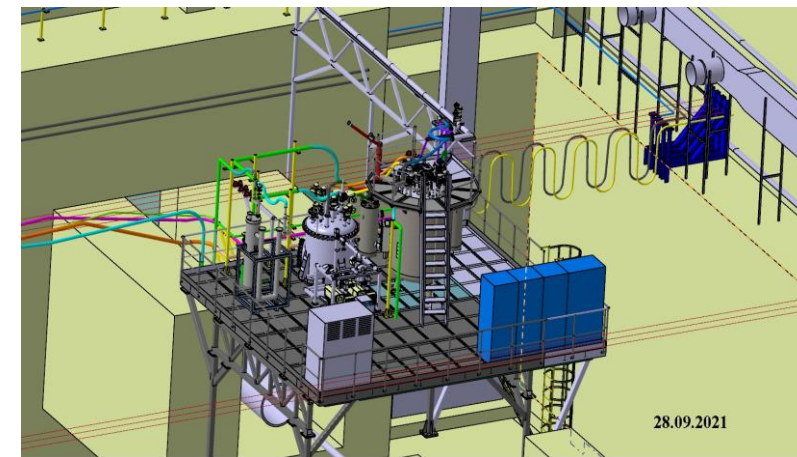
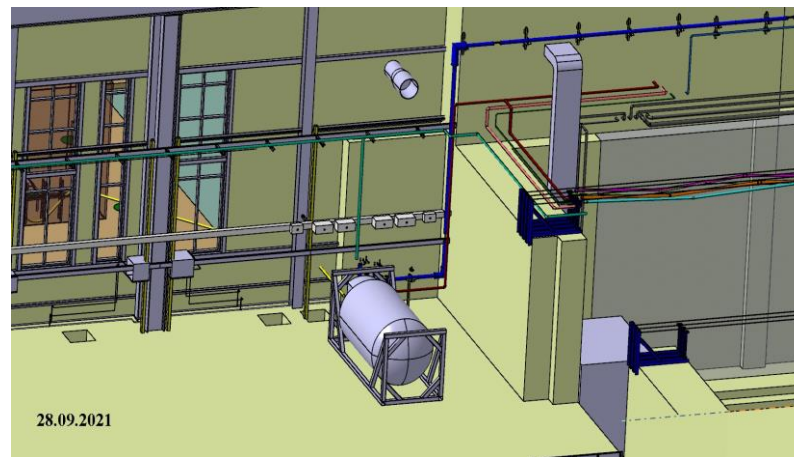
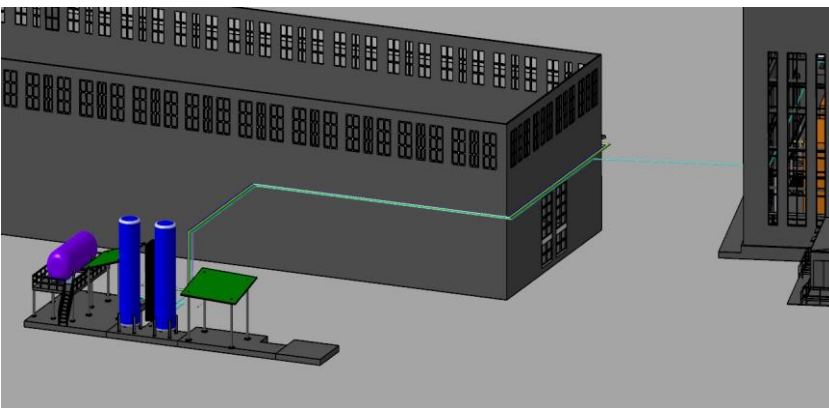
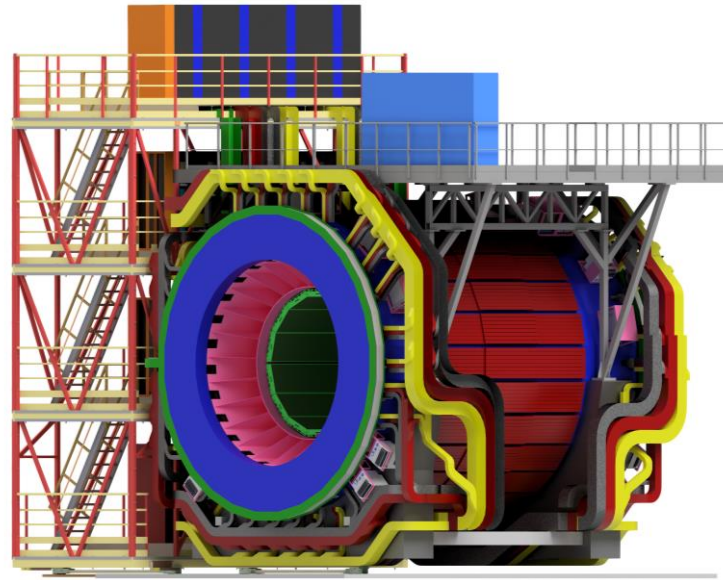
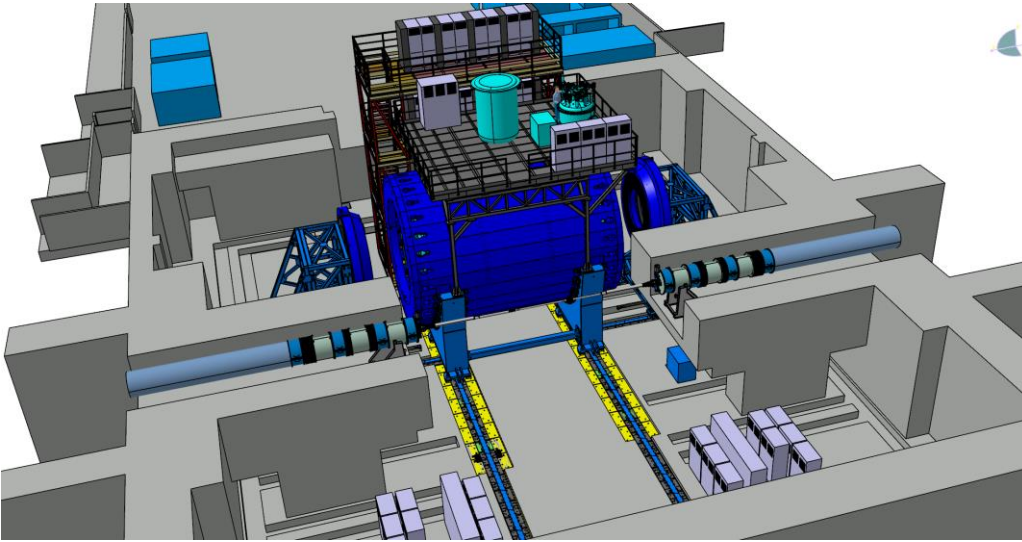


Status of the MPD integration

**Viacheslav Golovatyuk
(JINR)**

The MPD complex



List of the activities towards realization of our plan – Preparation the MPD for running on the collider beams

1	Subsystems of MPD: TOF, FHCAL and FFD, DAQ, Trigger	On the stage of production and tests according to schedule
	TPC 50-80 % of the FEE Ecal. 16 sectors out of 25	Have a chance to start in 2023 in not complete configuration
2	Electronics Platform	Tech. documentation is ready, signing contract on production Could be in simplified configuration
3	Cryogenics Infrastructure of the Solenoid. Gas&Liquid N ₂ and He pipes, LHe, LN ₂ tanks	LHe and LN2 pipes are ordered and partly produced Problem with delivering to JINR
4	Cooling systems for the FE electronics TPC and Ecal and thermostability of TPC	Tender on design and production Have a chance to start with a partly constructed cooling system
5	Equipment for detectors integration The lifting platform Equipment for Ecal installation Equipment for TOF installation Equipment TPC installation Platforms for FHCAL fixation in the poles Equipment for beampipe installation	In production Technical documentation in preparation In production In production In production Technical documentation in preparation

Prospect of contracts performance concluded by JINR with companies

Country	Company	Number of Contract	Subject	Сумма договора, EUR	Comments
Germany	Institut fuer Luft und Kaeltertechnik Gemeinnuetzige Gesellschaft mbH	08626319/21108253 6-74 от 11/01/2022	Contract with ILK for the assembly and commissioning of refrigerator	Agreement is signed	1.Self-assembly, 2. Resumption of cooperation if possible. Remote consultation as agreed (to be discussed with ILK)
Germany	STOHR ARMATUREN GmbH & Co KG, Germany	08626319/21644-73 б/д	Flexible pipeline No. 1; Flexible pipeline No. 2; Flexible pipeline No. 3	100% payment	Search for delivery options from Germany.
Italy	Costruz. Apparec. Elettron. Nucleari CAEN, Italy	08626319/210825-74 от 07/10/2021	Test equipment for TPC (LV)	50% payment	OK! Shipment from CAEN scheduled for April 20, 2022
Poland	FRAKO TERM, Poland	08626319/211092-73 от 08/02/2021	Thermal Screen for liquid nitrogen	100% payment	The firm plans to ship the screens by the end of April 2022.
England	A.S.Scientific Products Ltd, UK	08626319/211259-73 от 19/04/2021	Cryogenic pipeline 60m, supports made of low-carbon galvanized steel	Agreement signed	The supplier is ready to fulfill its obligations, subject to delivery from the UK on its own. Search for another producer.
England	A.S.Scientific Products Ltd, UK	08626319/21104052 4-74 от 29/11/2021	Heater housing with vacuum insulated helium heater with spare parts	Agreement signed	Search for delivery options from UK.
Czech Republic	CHART FEROX A.S.	08626319/211053-73/CHART Q145680 от 14/04/2021	Cryogenic stationary Liquid Nitrogen Tanks VT 21/18	30% payment	Search for delivery options

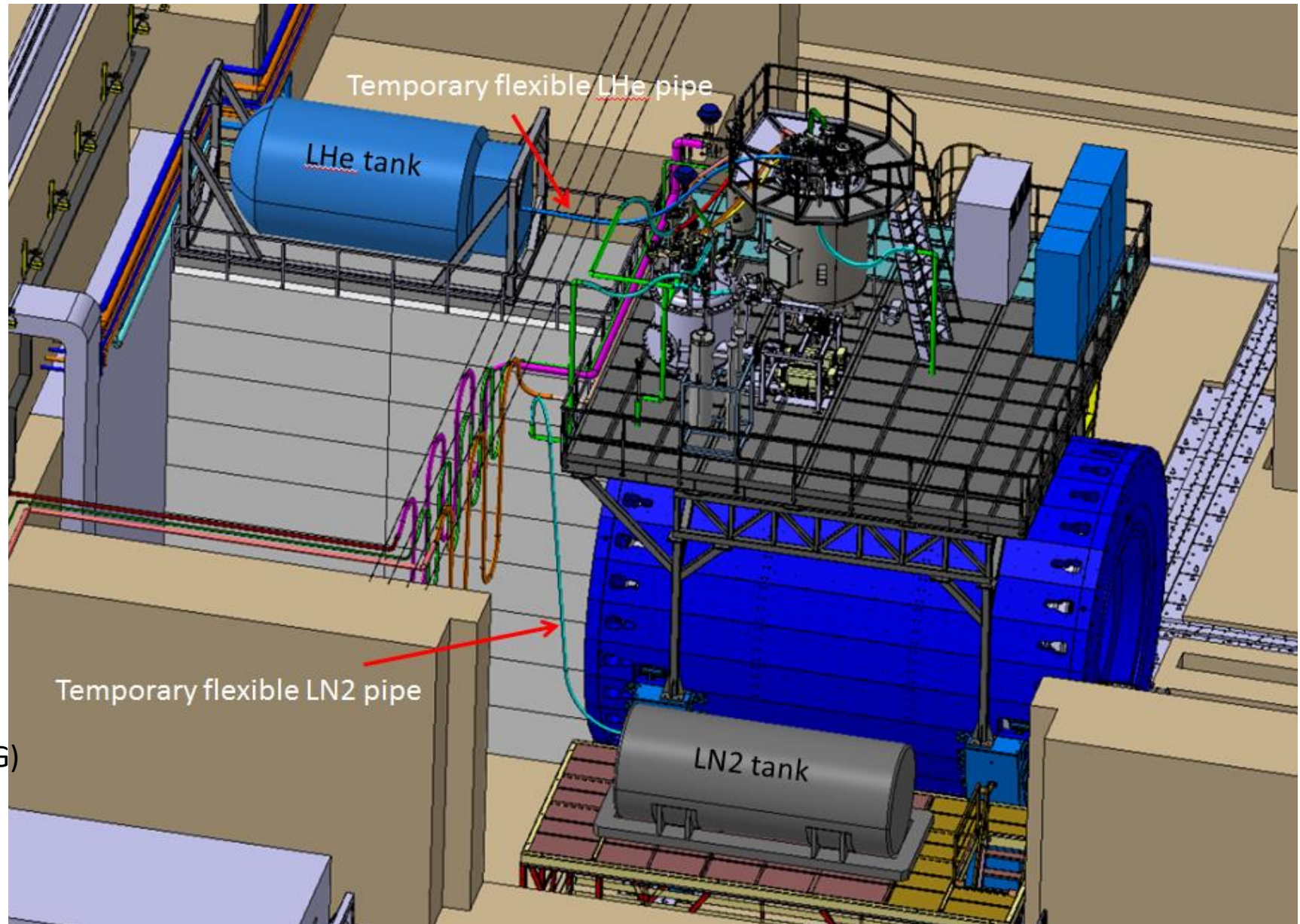
Temporary scheme of cooling at 4,5 K

In case we have no ordered pipes:

- Regular LHe pipe with LN2 shield.
- Regular LN2 pipes

Minimal configuration :

- LHe Tank (ready)
- LN2 transport tank (ready)
- Two heaters (ordered)
- Pipes between refrigerator and control Dewar (ready)
- LN2 manifold (TS is finalized)
- Other pipes (in process of ordering)
- Refrigerator (assembly will start at the end of May)
- Control Dewar (needed to be assembled, consultation with ASG)



Mass production of half sectors for ECal

700 modules out of 800 modules
produced in Russia
800 modules should be delivered
before July from China

**It is important for us to produce
and install all sectors at the
beginning.**

**Otherwise we need a big efforts
reassemble all cables to install
the rest of the sectors**



**We have a chance to complete production of
100% of Ecal barrel modules till the end of 2023,
it means production of additional 800 modules.
This goal is feasible in case of availability of all
required materials.**

**For that we need additional funds. China team is
ready to provide FE for this part of of sectors .
JINR site is able to build this amount of modules
till end of 2023. Money redistribution is required**

For completing the calorimeter up to 100% (additional 800 modules)

Materials -

Lead plates - 1 M\$

Light guides -0.6 M\$

Assembly of modules -1.5 M\$

Total: about 3 M\$.

Assembly of semi-sectors can be done on time

The production of 800 modules is difficult task to achieve in a short
time.

Activities to prepare Solenoid for the cooling

1. Work with Solenoid

- installation into Magnet Yoke
- alignment of Cold mass
- pressure test of Thermal shield and Cryostat cold mass
- replacement of flanges (transport to the working)
- vacuum test of Solenoid vessel, leak test of Cryostat
- connection temperature probes cables
- assembling Magnet Yoke
- alignment
- installation of Top platform
- chimney installation

2. Satellite Refrigerator Unit (SRU) - A new contract with ILK

- Development of the new control system for the SRU
- Spare parts for the SRU
- Assembly of the SRU
- Cold test of the SRU at 4.5K

3. Cryogenics infrastructure

- construction of platform for LN₂ tanks and other equipment
- pipes for LN₂ from tanks to the MPD hall
- liquid and gas pipes for N₂ and He inside of MPD Hall
- pipes on the cryogenic platform
- LHe tank in the MPD Hall
- external lines for gas direct and return He and N₂
- Two LN tanks installation

4. Power Supplies and Control system preparation

- electricity in the MPD hall
- water for cooling system
- control system

Milestones of MPD assembling in 2020-2023

Year 2020

- | | |
|-------------------|---|
| 1. July 15. | - MPD Hall and pit are ready to store and unpack Yoke parts |
| 2. August | - The first 13 plates of Magnet Yoke are assembled for alignment checks |
| 3. Sept 15-Oct 1. | - Solenoid is ready for transportation from ASG (Italy) |
| 4. November 10. | - Solenoid arrived |
| 5. Nov-Dec | - Assembling of Magnet Yoke |

Year 2021

- | | |
|--------------|--|
| 6. July-Aug | - Solenoid installation into Iron Yoke and alignment |
| 7. Aug - Dec | - Electrical, pressure and vacuum tests |

Year 2022

- | | |
|------------------------|--|
| 8. April 30 | - Cables for Solenoid probes signals are installed.
Ready for assembling of Iron Yoke |
| 9. Apr 30 - June 15 | - Assembling Iron yoke, Cryogenic platform and Cryostat. Vacuum test |
| 10. June 16t - July 30 | - Solenoid cooling down to Liquid Nitrogen temperature |
| 11. September 30th | - Cryogenic infrastructure ready |
| 12. Oct 1st - Nov 20 | - Cooling down to LHe temperature |
| 13. Nov 20th – Dec 30. | - Magnetic Field measurement |

Year 2023

- | | |
|--|-------------------------------------|
| 14. Jan 20 -Feb 15 | - Support Frame installation |
| 15. Feb 15 th – April 10th | - Installation of ECal half sectors |
| 16. March-July | - Electronics Platform assembling, |
| 17. April-July | - Cabling |
| 18. April 1 – June 5 th | - Installation TOF modules |
| 19. May15 st – August 1 st | - TPC installation |
| 20. June-July - | - FHCAL, Cosmic Ray test system |
| 21. August | - Switch on the MPD, Commissioning |