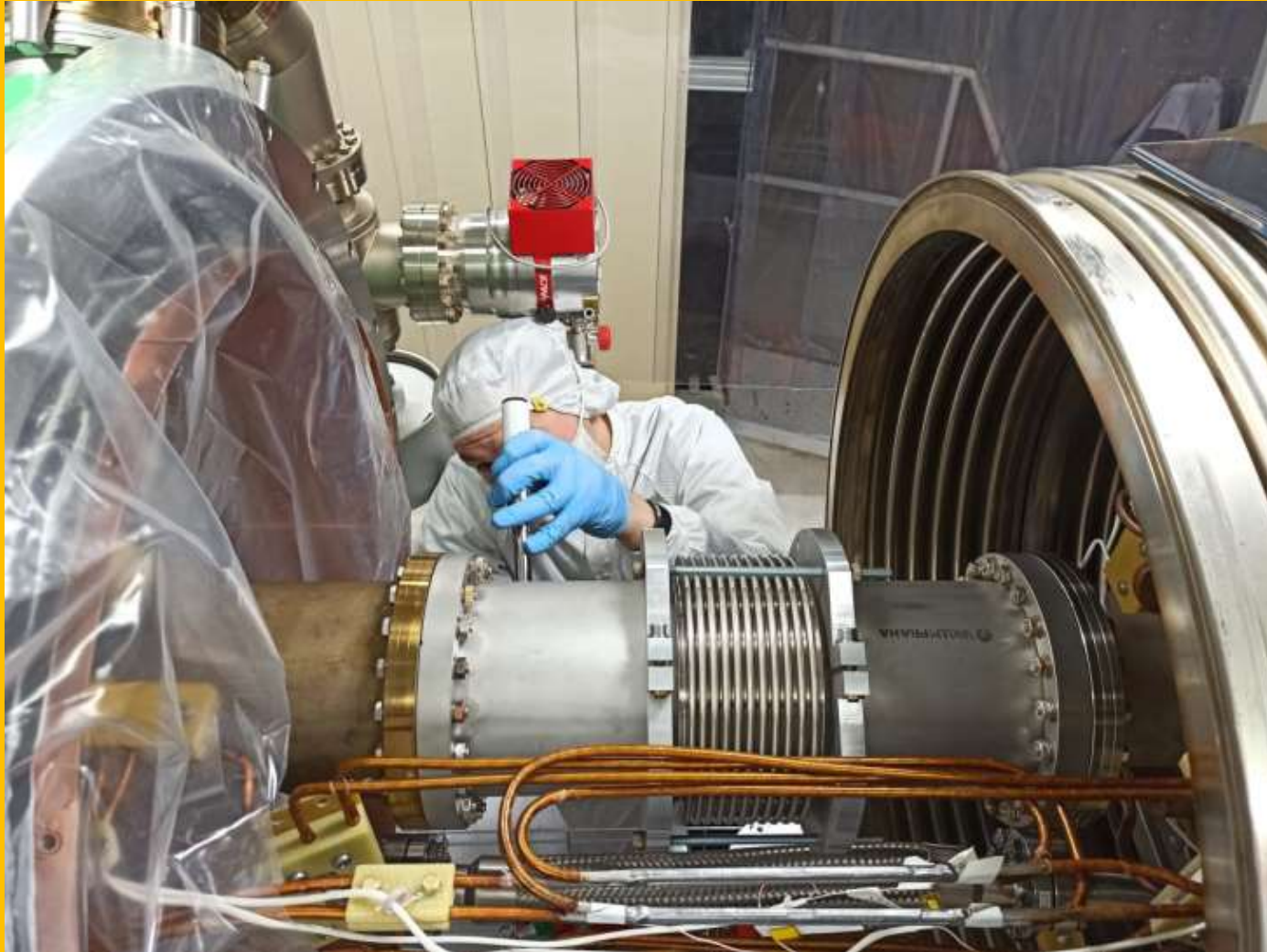


Implementation of the Nuclotron-NICA project

A.Sidorin, on behalf of the team



PP PAC, JINR, Dubna, 29 Jun 2020

Contents

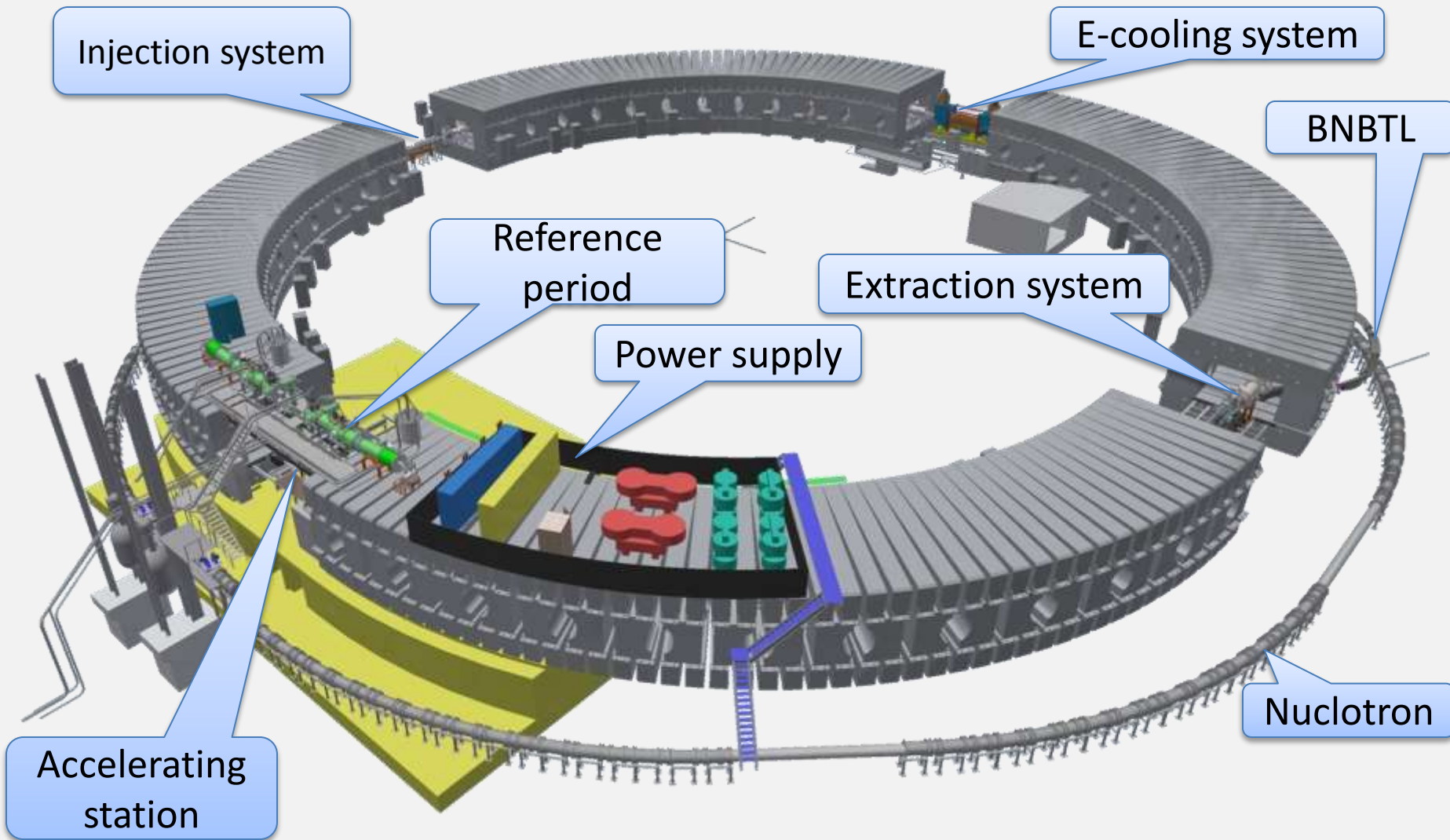
Status of the Booster assembly and commissioning

Plans for the NICA construction

Machine Advisory Committee meeting

Booster

Booster 3D view

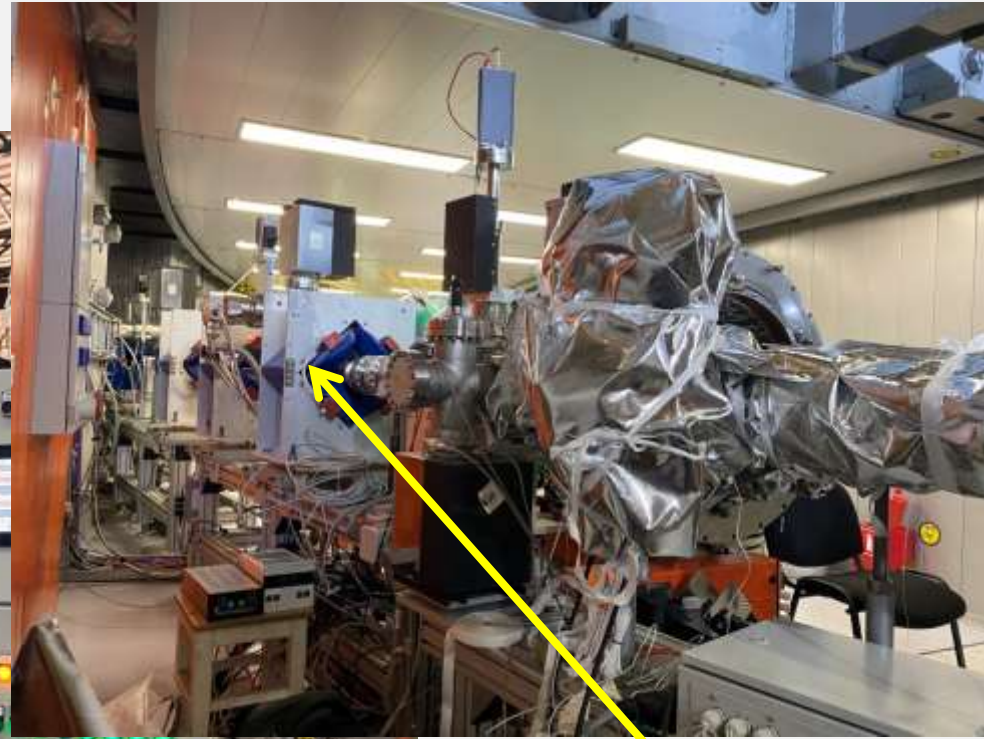


Injection system



Inflector plates

Septum



HLac-Booster
beam transport
line

RF system



Fast extraction system



Electron cooling system

Assembly of beam pipe and
“cold-warm” transition



Control and diagnostic systems



Control racks of
correctors



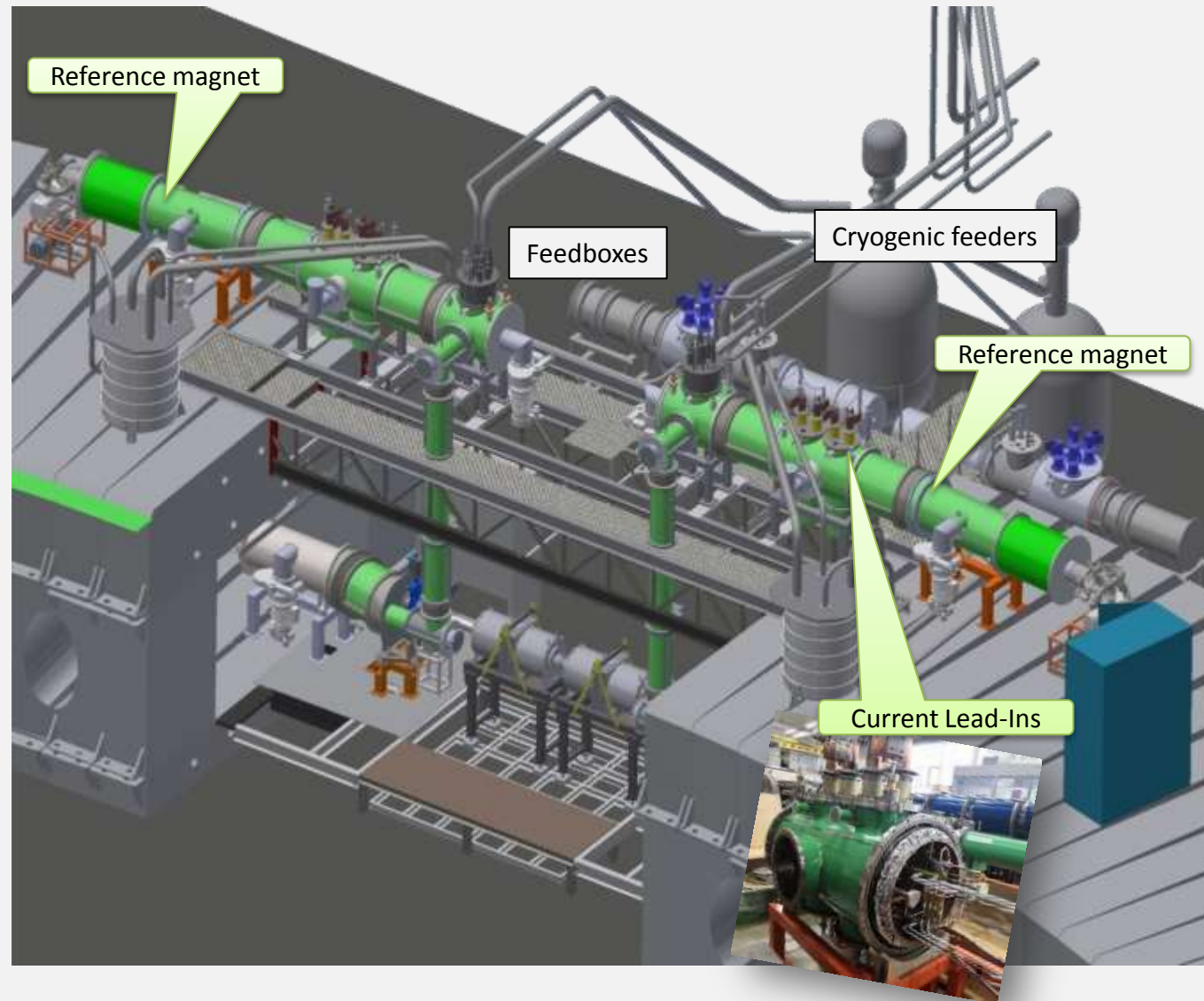
Measuring rack of
BPM and
thermometry



Correctors &
Q-meter

Reference section

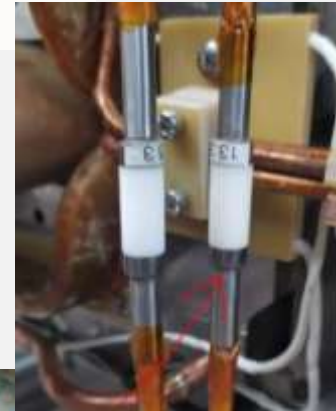
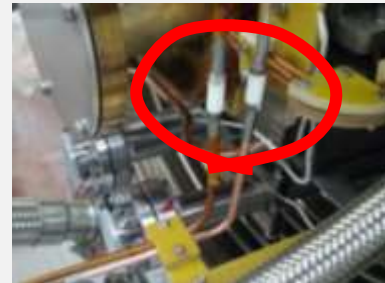
- ❖ **Reference magnets**
under assembling & testing
- ❖ **Two current lead-in modules**
under assembling
- ❖ **Two cryogenic feedboxes**
under assembling



Helium and Nitrogen systems

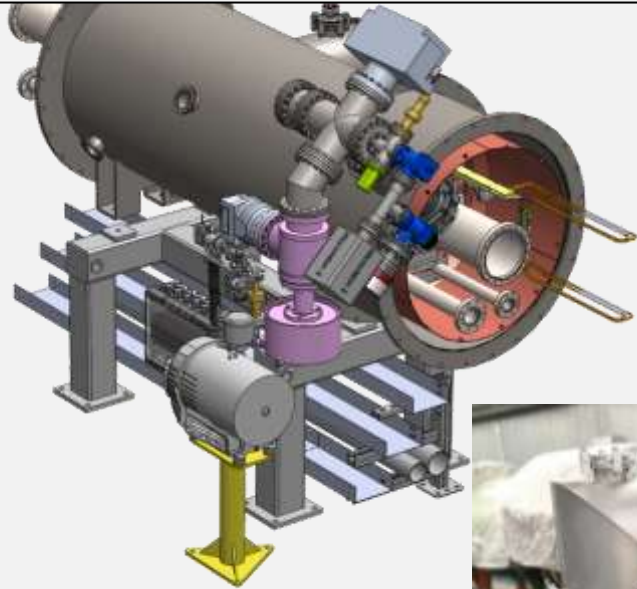
Problems identified during technological tests

- ❑ Leak in the helium system:
two leaks were detected in the insulators.
Leak localization and repairing took 2+ weeks (solved)
- ❑ Leak in the nitrogen system:
leaks were detected in the connections.
Clarification of the reasons led to the conclusion that a complete reassembly with improved flanges and new sealing rings is necessary : 6+ weeks (70% solved)
- ❑ Leaks in the valve body
(current lead-in cryostats): material defects were revealed during testing of finished assembly (cracks in the blanks): 5+ weeks (done)



Vacuum system

Pump stations of “cold” beam pipe



Pump stations of insulation volumes



Vacuum system

Assembly and
test
of beam pipe



Status of the Booster commissioning

- All main systems are prepared for operation
- reference period, bypasses, vacuum system – assembly & test
- 30% beam pipe are assembled and tested

Test with ion beam - August 2020

(about 2 months delay in accordance with initial plans:
caused by

- problems identified during technological tests,
- limitations due to COVID-19 pandemic)

Plans for the NICA construction

Following to Recommendations of NICA Cost & Schedule Review Committee *Dubna, 26 February 2020*

A project office is organized with the following responsible:

- | | |
|--------------------------|---------------------------|
| - <i>planning</i> | <i>S.A. Kostromin</i> |
| - <i>logistics</i> | <i>A.V. Slesarenko</i> |
| - <i>budget</i> | <i>V.V. Morozov</i> |
| - <i>quality control</i> | <i>H.G. Khodzhbagiyan</i> |
| - <i>safety</i> | <i>A.D. Kovalenko</i> |

The global plan has been restored and substantially improved

A preliminary list of milestones has been prepared - S.A. Kostromin

Key milestones

Overall project plan

УТВЕРЖДАЮ

Руководитель дирекции
проекта NICA

Г.В. Трубников

Руководитель проекта NICA

В.Д. Кекелидзе

Этапы реализации проекта NICA в 2020-2022гг.

#	Нед.	Ответственный
2020		
1	22	Дударев А.В., Топилин Н.Д.
2	29	Дударев А.В., Трубников А.В.
3	30	Бутенко А.В.
4	38	Емельянов Н.Э., Головатюк В.М.
5	49	Агапов Н.Н., Тихомиров Л.И.
6	50	Емельянов Н.Э., Топилин Н.Д.
7	51	Трубников А.В., Тихомиров Л.И.
2021		
8	04	Гуськов А.В.
9	06	Бутенко А.В.
10	12	Дударев А.В., Трубников А.В.
11	26	Потребников Ю.К., Долбилов А.Г.
12	29	Агапов Н.Н.
13	30	Дударев А.В., Агапов Н.Н.
14	31	Агапов Н.Н.
15	38	Бутенко А.В.
16	40	Бутенко А.В., Капишин М.Н.
17	42	Дударев А.В., Трубников А.В.
18	47	Головатюк В.М.
19	49	Костромин С.А., Ходжибагиян Г.Г.
20	50	Дударев А.В., Тихомиров Л.И.
2022		
21	4	Гуськов А.В.
22	24	Агапов Н.Н.

	полном объеме (10000 Вт на 4.5К)		
23	Запущены в эксплуатацию каналы с пучками для прикладных исследований	25	Сыресин Е.М.
24	Технический пуск сверхпроводящей магнитной системы коллайдера NICA	28	Бутенко А.В., Ходжибагиян Г.Г., Костромин С.А.
25	Начат Сеанс №1 с пучком на Коллайдере NICA	36	Бутенко А.В., Мешков И.Н., Сыресин Е.М.
26	Введен в эксплуатацию Центр NICA	45	Трубников А.В., Тихомиров Л.И.
27	Подготовлена разрешительная документация, введен в эксплуатацию комплекс NICA	49	Агапов Н.Н., Кекелидзе В.Д.
28	Зарегистрировано первое событие в установке MPD — начало международной исследовательской программы NICA	50	Кекелидзе В.Д., Трубников Г.В.

Согласовано:

Агапов Н.Н.

Гуськов А.В.

Дударев А.В.

Емельянов Н.Э.

Костромин С.А.

Потребников Ю.К.

Топилин Н.Д.

Тихомиров Л.И.

Бутенко А.В.

Головатюк В.М.

Долбилов А.Г.

Капишин М.Н.

Мешков И.Н.

Сыресин Е.М.

Трубников А.В.

Ходжибагиян Г.Г.

Key milestones



Approved

V. Kekelidze
V. Kekelidze

...main points

2020

- ❑ Booster commissioning
- ❑ construction cryogenic compressor station W49

2021

- ❑ Booster – Nuclotron channel commissioning W06
- ❑ LHEP electrical substation commissioning W49
- ❑ BM@N run W40
- ❑ MPD commissioning W47

2022

- ❑ NICA cryogenic system fully commissioned W24
- ❑ Start of Collider Run#1 W36

#	NICA project Key Milestones	Week	Responsible
2020			
1	MPD hall ready for magnet assembly	22	A. Dudarev, N. Topilin
2	W arc & Nuclotron-collider tunnels ready for equipment installation	29	A. Dudarev, N. Topilin
3	Booster synchrotron commissioning with a beam	30	A. Butenko
4	MPD SC-solenoid delivered to the LHEP JINR	38	N. Emelianov
5	Construction of the cryogenic compressor station completed	49	N. Agapov, L. Tikhomirov
6	Center NICA project approved by the Main State Expertise	51	A. Trubnikov, L. Tikhomirov
2021			
7	SPD CDR completed	04	A. Guskov
8	Booster-Nuclotron channel commissioning	06	A. Butenko
9	E arc and straight sections ready for Collider equipment installation	12	A. Dudarev, N. Topilin
10	Stage 1 of the NICA computer cluster and network completed	26	Yu. Potrebenikov, A. Dolbilov
11	Central cryogenic plant (bld. 1B) commissioned (refrigeration capacity 6000 W at 4.5K)	29	N. Agapov
12	LHEP main electrical Sub-station of 40.8 MW commissioned	30	B. Gikal
13	New Compressor station commissioned	31	N. Agapov
14	Booster + Nuclotron with a beam at BM@N put in operation	38	A. Butenko
15	BM@N run with heavy ion beams started	40	M. Kapishin
16	Reconstruction of Bld for applied researches completed	42	L. Tikhomirov, A. Trubnikov
17	Commissioning of MPD	47	V. Golovatyuk
18	Production and testing of Collider magnets completed	49	S. Kostromin, H. Khodzhbagiyan
19	Collider building #17 is put into operation	50	A. Dudarev, L. Tikhomirov
2022			
20	SPD TDR completed	4	A. Guskov
21	NICA cryogenic system fully commissioned (refrigeration capacity 10000 W at 4.5K)	24	N. Agapov
22	Nuclotron-Collider & channels for applied researches commissioning with a beam	25	E. Syresin
23	Collider cryo-magnetic system commissioned	28	A. Butenko
24	Start of the Collider Run#1	36	A. Butenko, I. Meshkov
25	Center NICA put into operation	45	A. Trubnikov, L. Tikhomirov
26	NICA accelerator complex commissioned	49	N. Agapov, V. Kekelidze
27	Registration of 1 st event @ MPD — Start of NICA international research program	50	V. Kekelidze, G. Trubnikov

XIth Session of the NICA Machine Advisory Committee

27-29 May, 2020

The present limitations due to COVID-19 pandemic did not allow the usual in-person meeting. Therefore, the MAC meeting was organized as a video conference. The discussion was restricted to an update of the project and the most urgent issues of the project. Despite the unusual situation, the video meeting provided a good overview of the status and an efficient discussion of the most urgent problems.

14 reports during 3 days

<https://indico.jinr.ru/event/1335/>

Thank you for attention

