List of requests to run during LS3

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R. Scrivens on behalf of LINAC3 and LEIR
E. Sargsyan on behalf of LINAC4 Source / 3 MeV test stand
P. Korysko on behalf of CLEAR
C. Duchemin on behalf of MEDICIS
S. Rothe on behalf of the ISOLDE offline separators
M. Van Dijk on behalf of the MADMAX collaboration
M. Jaekel on behalf of GIF++
E. Gschwendtner on behalf of AWAKE
M. Jaekel on behalf of the Neutrino Platform
F. Butin, M. Jaekel, D. Gamba on behalf of ELENA & GBAR
M. Jaekel on behalf of the Neutrino Platform
D. Banerjee on behalf of AMBER

- Facility Operations Meeting (FOM) gathered the requests since the beginning of this run, i.e. February 6
- They were not checked, i.e., they are included here as received
- **Requests received as of 19.04.2024:**
  - **Linac3 and LEIR** by Richard Scrivens
  - **Linac4 Source Test Stand / 3 MeV Test Stand in bld.152** by Edgar Sargsyan
  - **CLEAR** by Pierre Korysko
  - **MEDICIS** by Charlotte Duchemin
  - **ISOLDE offline 1 and offline 2 separators** by Sebastian Rothe
  - **MADMAX** by Maarten Van Dijk
  - **GIF++** by Martin Jaekel
  - **AWAKE** by Edda Gschwendtner
  - **Neutrino Platform** by Martin Jaekel
  - **ELENA / GBAR** by Francois Butin, Martin Jaekel and Davide Gamba
  - **BASE and BASE-STEP** by Martin Jaekel
- Added on 25.04.2024
  - **AMBER** by Dipanwita Banerjee

FACILITY: Linac3 + LEIR

GOALS & JUSTIFICATION:

- Test of ion types for Future Ions Working group (for Run4 North Area). 8 months in Linac3, 2 months Linac3+LEIR.
- Testing during operation years is limited to 1 ion per year. LS3 testing would allow ~3 ions to be tested.

SCOPE:

- For approximately 8 months only Linac3 would be tested.
- During an additional 2 months beam tests of Linac3+Switchyard+LEIR

SCHEDULING:

- 2x 4months – Beam only in Linac3
- 1x 2months – Beam in Linac3, Switchyard and LEIR - these could be scheduled with the restart of the PSB when the switchyard will be closed.
- These sub blocks (4 months and 2 months) are not internally divisible.

SERVICES REQUIRED:

EN/CV	Demin water (b235), local water, PS chilled water, town water, ventilation for b351, LEIR ventilation systems.	**SY/RF**	RF equipment operation.
TE/VSC	Accelerator vacuum and controls	**SY/ABT**	LEIR equipment operation
BE/CSS	Operational controls (LSA, CMW, timing). Controls interventions can be tolerated.	**SY/STI**	Linac3+LEIR equipment operation
SY/EPC	All Linac3+LEIR power converters	**SY/BI**	Linac3+LEIR equipment operation
TE/MPE	Warm magnet interlock operation	**BE/ABP**	Linac3 Source operation
HSE/RP	Assessment of new ions (under ion project). Operational support.	**EN/AA**	Switchyard/LEIR access during LEIR tests
BE/OP	Operational software. Who can give access to LEIR when in beam mode?	**BE/CEM**	Timing operation, slit and stripper controls, FECs

OTHER RELEVANT INFORMATION:

- Does not require piquet services. Best effort in working hours support needed

FACILITY: Linac4 Source Test Stand / 3 MeV Test Stand in building 152

GOALS & JUSTIFICATION:

- Source development and tests, training and keeping up to date the skills of HSL personnel required for Linac4 source operation and maintenance.
- Possibility of testing and (re)validating source spares, possibly (tbc) the RFQ spare, and any other spares or equipment that will eventually be installed in the accelerator.
- Providing a facility for testing controls, including timing, beam instrumentation, or other equipment.

SCOPE:

- Entire test stand area with the associated services.

SCHEDULING:

- Entire duration of LS3. No specific schedule at this point but some periods of stops can be envisaged, if necessary.

SERVICES REQUIRED:

EN/CV	Availability of cooling water and compressed air.	**HSE/RP**	Possible radiation measurement in case of source configuration change and/or RFQ operation.
TE/VSC	Support in case of issues with vacuum system.	**SY/BI**	Support for beam instrumentation and its controls in case of issues or new developments which need to be tested.
SY/RF	Support for operation and troubleshooting of source RF power amplifier and possibly (tbc) of RFQ and its klystron.	**EP/DT**	Support (e.g. H2 gas leak detection) for source gas injection system when the source or its relevant components are changed.
BE/CSS	Availability of controls and controls infrastructure, timing.	**EP/DT**	Electrical power to the racks.
SY/EPC	Support in case of issues with source HV transformers, RF amplifier anode power converter, magnet power supplies, and possibly (tbc) RFQ klystron modulator.	**Transport**	Installation/de-installation of beamline equipment.

OTHER RELEVANT INFORMATION:

FACILITY: CLEAR

GOALS & JUSTIFICATION:

- CLEAR User Beam Line normal Operation.
- CLEAR is not supposed to stop its Operation during the LS3.

SCOPE:

- All listed services will be needed for CLEAR Operation.

SCHEDULING:

- CLEAR will have Beam from the last week of February to the second week of December, every year.

SERVICES REQUIRED:

EN/CV	Needed if there are issues with the CLEAR cooling systems and with the CLEAR ventilation system in the tunnel.	**SY/RF**	Needed if there are issues with the CLEAR RF systems.
TE/VSC	Needed if there are major issues with the CLEAR vacuum and for the leak detector.	**SY/ABT**	No specific needs.
TE/CRG	No specific needs.	**SY/STI**	Needed if there are issues with the CLEAR Laser and Photocathode.
BE/CSS	Needed if there are issues with CCM.	**SY/BI**	Needed if there are issues with the instrumentation in CLEAR (Cameras, BPMs, Controls, Softwares, etc).
SY/EPC	Needed if there are issues with the CLEAR Converters.	**…**	Needed to switch CLEAR to Beam/Access/Patrol mode.
HSE/RP	Needed to access the CLEAR tunnel and to measure/track equipment.	**…**	

OTHER RELEVANT INFORMATION:

- The extension of CLEAR, beyond 2025, is not yet approved and will be discussed in Q2 2024.
- The way to switch to Beam/Access/Patrol mode will be critical and needs to be discussed.

FACILITY: MEDICIS

GOALS & JUSTIFICATION:

- CERN-MEDICIS will produce radionuclides for medical research from externally irradiated targets
- Running to LS3 will cover the needs of the medical community within the MEDICIS collaboration and the PRISMAP European Network.

SCOPE:

- All the facility will operate as being performed outside of Long Shutdowns except that no target will be sent and retrieved from the ISOLDE target area. The activities will be performed only within the infrastructure of bdg 179 (179/R), including the operation of the MELISSA laser laboratory (179/1).

SCHEDULING:

- CERN-MEDICIS expects to be in maintenance period from January to April 2025 as well as from January to April 2026.
- CERN-MEDICIS and MELISSA expects to be in operation mode from April 2025 till November 2025 as well from April 2026 till November 2026.

SERVICES REQUIRED:

EN/CV	YES – cooling water and ventilation in 179 ensured	**SY/RF**	NO
TE/VSC	YES – Yearly check, balloons emptying, assistance if needed	**BE/CSS**	YES – controls and op consoles.
TE/CRG	NO	**SY/STI**	YES – Front-End, Montrac, Robots, safety office.
BE/CSS	NO	**SY/BI**	YES – assistance for FC and scanner, if necessary.
SY/EPC	YES – power supplies yearly check and assistance if needed	**BE/CEM**	YES – Robot operation and maintenance, op consoles.
HSE/RP	YES – operational RP, g-spectrometry and shipping service	**EN/AA**	YES – Access system maintenance and assistance if needed.

OTHER RELEVANT INFORMATION:

- CERN-MEDICIS has ben operating in these conditions during LS2.

FACILITY: ISOLDE OFFLINE 1 and OFFLINE 2

GOALS & JUSTIFICATION:

- Machine is required for machine development campaigns (hardware and software) that are not possible during runs due to lack of resources

SCOPE:

- All elements of OFFLINE 2, OFFLINE 1 and auxiliary setups (YPS1, YSD, YPS3) shall be operational

SCHEDULING:

- Ideally no interruptions till run 4

SERVICES REQUIRED:

CE/SAM	Local AC and machine cooling water	**SY/RF**	
TE/VSC	Vacuum system	**SY/ABT**	
TE/CRG		**SY/STI**	Operation and maintenance of the facility
BE/CSS		**SY/BI**	Faraday cups and scanners
SY/EPC	Power converters	**BE/CEM**	Controls : Frontend, gas system, thermocouples, Labview support
HSE/RP		**BE/OP-ISO**	Top level software support

OTHER RELEVANT INFORMATION: support requested on **best effort** basis

FACILITY: MADMAX

GOALS & JUSTIFICATION:

- List of the main objectives that you want to achieve with this request.

MADMAX uses a new concept (dielectric haloscope) to search for axion dark matter in a mass range centered around 100 μeV, favored by post-inflationary scenarios and not yet explored. A prototype of the final experiment, including a stainless steel cryostat, is presently being build and will be inserted in the Morpurgo magnet of the H8 line.

- Explain why it needs to be done during the LS3 and the consequences if your request is not approved.

The MADMAX prototype run in the Morpurgo magnet requires the complete absence of beam. The stainless steel cryostat was designed to fit in the Morpurgo magnet.

SCOPE:

- Usage of the Morpurgo magnet of the H8 line including the upstream zone of H8B (PPE158) and the platform downstream of the magnet.

SCHEDULING:

- A long run for physics of the order of six months is preferred. Overall if we could stay on the Morpurgo site for one year to prepare (3 months), run (6 months) and dismantle (3 months), that would be great.
- Include any scheduling constrains that need to be taken into account.

The preferred period is Dec. 2025 to Dec. 2026: i) preparation Dec. 2025- Mar 2026, ii) run with Morpurgo magnet at 1.6 T: Apr-Sep 2026, iii) Dismantling: Oct-Nov 2026.

SERVICES REQUIRED: More details provided in EDMS 2477727

EN/CV	• Mixed water for cooling (required during cooldown of the Morpurgo magnet and the physics run)
TE/CRG	• Cooling of the MORPURGO magnet • LHe / LN2 storage dewars from Cryolab / external company + recovery lines (He, N2) for cryostat cooldown. • 2 vacuum pump units, cryocoolers and 5 compressor units, circulation pump for gHe, water chiller
EP/ADO-SO	Usage of Morpurgo magnet
BE/EA-DC	Crane to install the cryostat and its rails. Working place Tent set-up installation

OTHER RELEVANT INFORMATION:

- Include any other information that you consider important to evaluate your request.

Morpurgo magnet zone is already used by the MADMAX group for tests during the Beam shutdown period since 2022. All installations in this area have already been foreseen to perform the test with the stainless steel cryostat

FACILITY: GIF++ @ EHN1

GOALS & JUSTIFICATION:

- Continuation of ageing studies for the Muon gas detectors of the LHC experiments - this is essential in judging the performance and lifetime of the muon chambers in the HL-LHC phase
- Further advances in the development of environmentally friendly gas mixtures to be use in Muon gas detectors - again an essential part of the aim to reduce the global environmental footprint of CERN and future facilities
- Further development of gas detectors for future experiments

SCOPE:

- We need to run the facility in stand-alone mode, identically to LS2 or several YETS

SCHEDULING:

- The full duration of LS3 (within reasonable limits)
- If needed to stop, a longer stop is preferred to short stops, as we need ≈ 2 days for recovering (flushing chambers etc.)

SERVICES REQUIRED: Normal operation condition, including access & alarm systems. Support from transport and radiation protection. Gas supply, including handling of bottles.

EN/CV	Minimal rack cooling, compressed air and HVAC bunker	**EN/AA**	Access control system / Gas detection system / Fire detection system operational
EN/EL	Power to main GIF++ switchboard and control room	**EN/HE**	Handling and transport of detector chambers opening floor tiles, handling gas bottles/banks
HSE/RP	Check of material leaving GIF++ (To be discussed) Periodic check of the sources Operation of RAMSES detectors inside bunker	**BE/EA**	Primary gas supply, scaffolding for annual maintenance
IT	stable network connection		

OTHER RELEVANT INFORMATION: The GIF++ has been designed to run in standalone mode (operating with the Cs-Irradiator) during all times when no muon beam is available since 2014. We normally only stop during the Christmas shutdown and the annual maintenance.

FACILITY: AWAKE

GOALS & JUSTIFICATION:

- Laser room (TSG40) is not affected by CNGS dismantling. Laser R&D will continue during LS3
- Commissioning of new experiment, including both laser and electron beamline, is scheduled to start before the end of LS3, to ensure readiness for proton beam as soon as LS3 is finished

SCOPE:

- TSG40 (laser). TT41/TCC4 (laser and electron beam)

SCHEDULING:

- Laser R&D in TSG40 will take place from January to December, every year
- Commissioning of laser/electrons in TT41/TCC4 will start in January 2028

SERVICES REQUIRED: Provide a general summary of the services that you will need in this section. Provide details for each group involved in the section below.

EN/CV	Laser-room cooling	**SY/RF**	Electron gun and accelerator
TE/VSC	Vacuum in laser and electron lines	**SY/ABT**	-
TE/CRG	-	**SY/STI**	Electron gun photocathode
BE/CSS	Controls for laser and electron lines	**SY/BI**	Laser and electron instrumentation
SY/EPC	Electron line power converters	**…**	
HSE/RP	Monitoring of electron line	**…**	

OTHER RELEVANT INFORMATION:

- The majority of these services will be closely involved during the CNGS and post-CNGS work in TAG41.

FACILITY: ELENA

GOALS & JUSTIFICATION:

1. Measure in detail reaction $H + Ps \rightarrow H^- + e^+$ (1) using laser neutralised H^- beam from ELENA
2. Continue improving positron production, accumulation, transport (uses electron linac)
3. Allows optimising processes before next antiproton run, otherwise these optimisations will have to be performed during $\overline{p}$ run

SCOPE:

- Demineralised water, power, compressed air, ELENA beam (for item 1 above), computer network

SCHEDULING:

1. H^- beam : **at least** 5 consecutive months, or 2 periods of 3 months
2. Positrons: periods of **at least** 3 weeks without cuts, as many as possible

SERVICES REQUIRED: *Provide a general summary of the services that you will need in this section. Provide details for each group involved in the section below.*

EN/CV	demineralised water, hall air cond.	**SY/RF**	
TE/VSC		**SY/ABT**	
TE/CRG	LHe (1 dewar/3 months)	**SY/STI**	
BE/CSS	ELENA triggers	**SY/BI**	
SY/EPC		**EN/HE**	Dewar handling, modifications/ repair of apparatus
HSE/RP	Beam permits (linac, ELENA), DSO tests?	**…**	

OTHER RELEVANT INFORMATION: The time taken to obtain beam permits is not included in the above duration requests

FACILITY: Neutrino Platform

GOALS & JUSTIFICATION:

- Operation of the Neutrino Platform

SCOPE:

- Test ProtoDUNE and operate the Neutrino Platform

SCHEDULING:

- NP will be operated throughout LS3

SERVICES REQUIRED: Provide a general summary of the services that you will need in this section. Provide details for each group involved in the section below.

EN/CV	Cooling the racks in the DAQ barrack racks Maintain ventilation in NP02 and NP04 pits	**SY/RF**	
TE/VSC		**SY/ABT**	
TE/CRG	Operate NP02 and NP04 cryogenics	**SY/STI**	
BE/CSS		**SY/BI**	
SY/EPC		**…**	
HSE/RP		**…**	

OTHER RELEVANT INFORMATION:

- The majority of these services will be closely involved during the CNGS and post-CNGS work in TAG41.

FACILITY: AD – BASE and BASE-STEP

GOALS & JUSTIFICATION:

- Run experiment during shutdown – which provides ideal conditions to achieve highest frequency resolution in single-particle based antiproton studies.
- It is necessary to run the experiment during shutdown periods, based on the unique antiproton reservoir which exists in BASE, this allows measurements at highest resolution, however, only during accelerator shutdown, when the magnetic noise caused by accelerators is turned off.

SCOPE:

- We need Electrical power / supply with cryoliquids (one dewar per week) / the crane needs to be operational / air-conditioning system active would be wanted and is helpful, but not essential.

SCHEDULING:

- Operation from end of 2025 until end of 2026
- We need detailed information about planned liquefier shutdown and planned power cuts.

SERVICES REQUIRED: Provide a general summary of the services that you will need in this section. Provide details for each group involved in the section below.

EN/CV	Yes, if possible, not essential	**SY/RF**	No
TE/VSC	Yes, BASE vacuum, CERN groups not concerned	**SY/ABT**	No
TE/CRG	YES, supply of 500l of LHe each week	**SY/STI**	No
BE/CSS	No	**SY/BI**	No
SY/EPC	No	**EN/HE**	Yes, we continuously need the crane
HSE/RP	No	**No…**	

OTHER RELEVANT INFORMATION:

FACILITY:

GOALS & JUSTIFICATION:

- AMBER Phase-1 program approved by CERN extends beyond LS3 with two years of Drell-Yan and eventually a second year of the Proton Radius Measurement programs, thus we need:
- 1. To keep AMBER spectrometer ready to restart data taking after LS3
- 2. To test new Triggerless front/end electronics compatibility with a new AMBER FriDAQ triggerless DAQ System
- 3. To improve spectrometer magnets (SM1 and eventually SM2)field knowledge
- 4. To substitute obsolete hardware infrastructure and control electronics (gas systems PLCs etc) to make them CERN standards compatible

SCOPE:

- Nitrogen for tracking/PiD detectors flushing: 60m^3/day
- Crane(s) availability for operation on the spectrometer / spectrometer maintenance
- SM1 field mapping using existing equipment, we need SM1 power/cooling, measuring devices
- New triggerless AMBER DAQ&F/E test in the dry run: DAQ cooling, normal power distribution in the EHN2, Ethernet networking available in EHN2
- Spectrometer gas systems upgrade: PLCs and other electronic components (sensors, mass flowmeters, gas quality monitoring: water, oxygen etc.)
- Preparations for DY Run after LS3, Radioprotection,M2 beam line upgrades (vacuum improvements)

SCHEDULING:

- SM1 Field mapping 2026 or 2027, it might take together with preparations ~ 6 months
- DAQ&FE is currently planned for 2027, duration of the test 1.5 months
- Standard services (crane, Nitrogen, pressured air, power should be available in EHN2 over the whole LS3)

SERVICES REQUIRED: Provide a general summary of the services that you will need in this section. Provide details for each group involved in the section below.

EN/CV	Cooling DAQ barrack, Cooling of the SM1/2, compressed air	**SY/RF**	
TE/VSC		**SY/ABT**	
TE/CRG		**SY/STI**	