

Commissioning Ideas for ILC from TESLA (TESLA Report 2002-09)

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DESY

Commissioning during construction should allow:

- to save time
- to find and maybe correct errors for the rest of the construction

BUT

it might impact the installation schedule.

Make best use of time, get started as early as possible

BUT

don't compromise the installation schedule.

Impact on Installation

- Order of construction and installation needs to take commissioning into account. Note, that infra structure components and subsystems (water, power, air, interlocks, personal safety, controls) often have connections across linac subsystems. The installation of subsystems follows in general a very different order than the installation of linac components.
- Commissioning during construction requires some add-ons:
 - local shielding
 - beam dumps
 - bypass lines
 - special diagnostics
 - ...

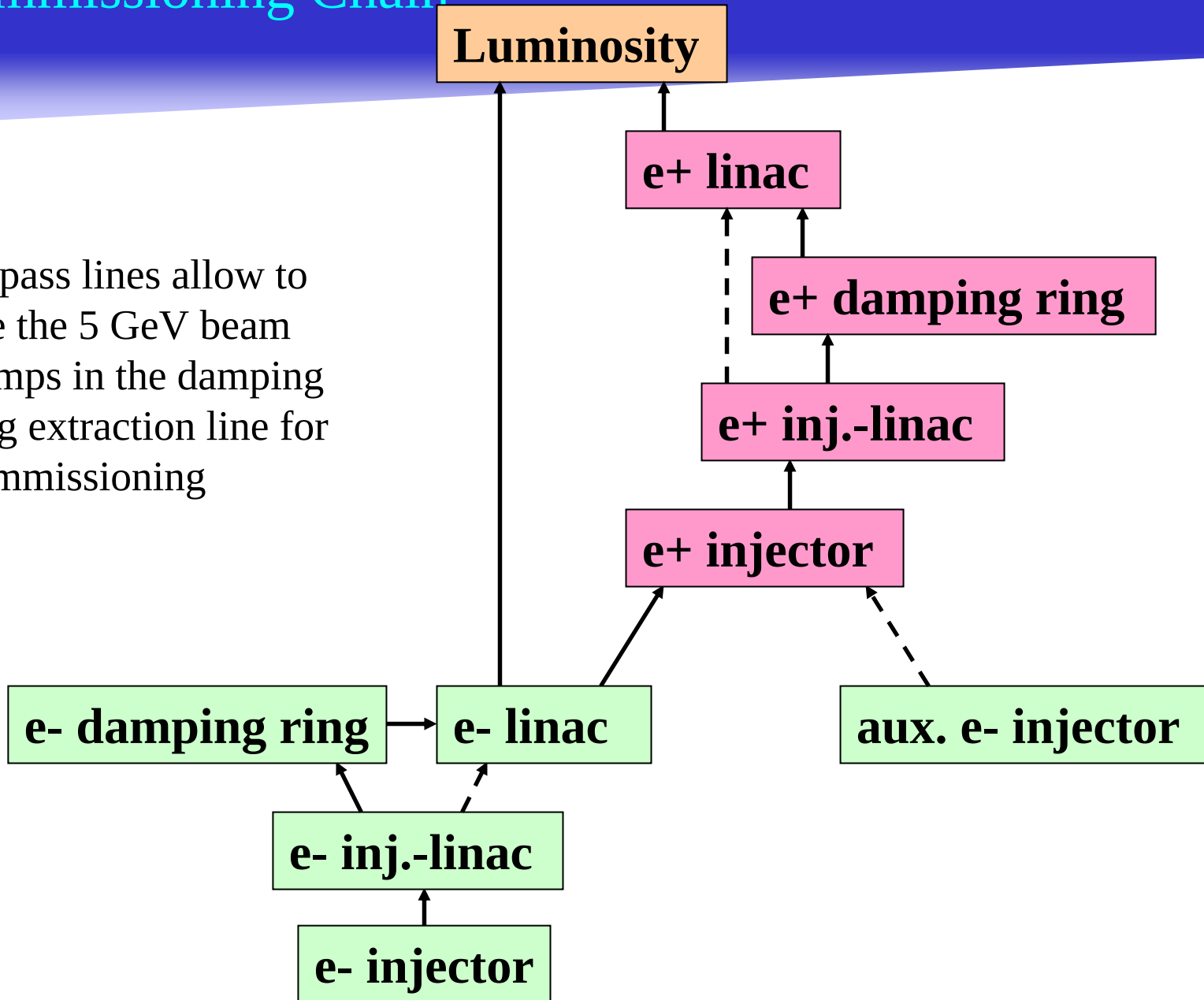
Impact on Installation

- The persons involved in the commissioning will also take responsibility in the design and construction of the machine. Person power of technical groups will in any case be limited.

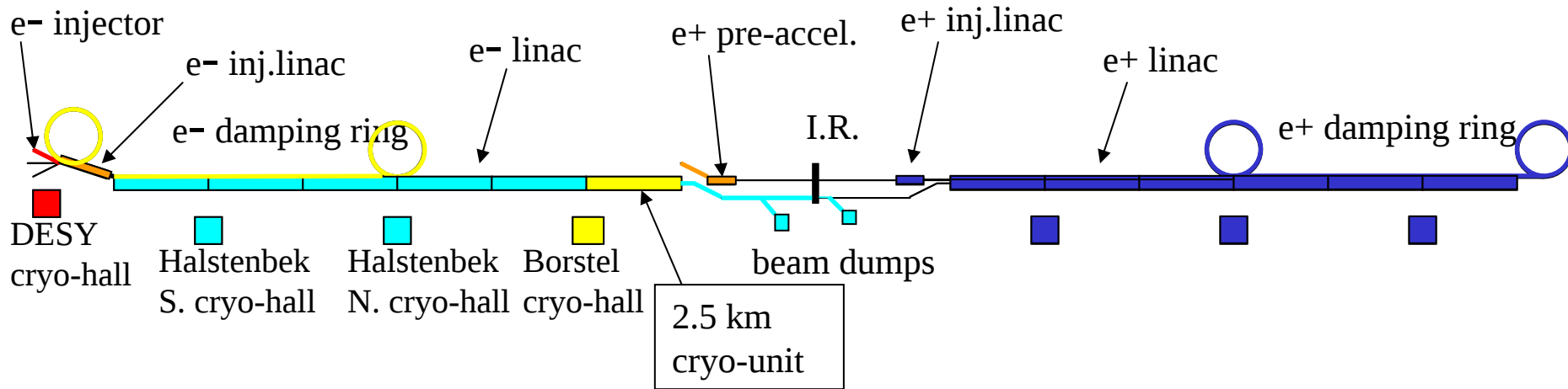
Commissioning periods during construction should be limited in time.

Commissioning Chain

Bypass lines allow to use the 5 GeV beam dumps in the damping ring extraction line for commissioning



Commissioning phases for TESLA



Phase 1: electron injector (500 MeV)

Phase 2: electron inj.-linac (5 GeV)
+ auxiliary electron injector
+ positron pre-accelerator

Phase 3: electron damping ring
+ 2.5 km cryogenic unit

Phase 4: electron linac

Phase 5: all the rest

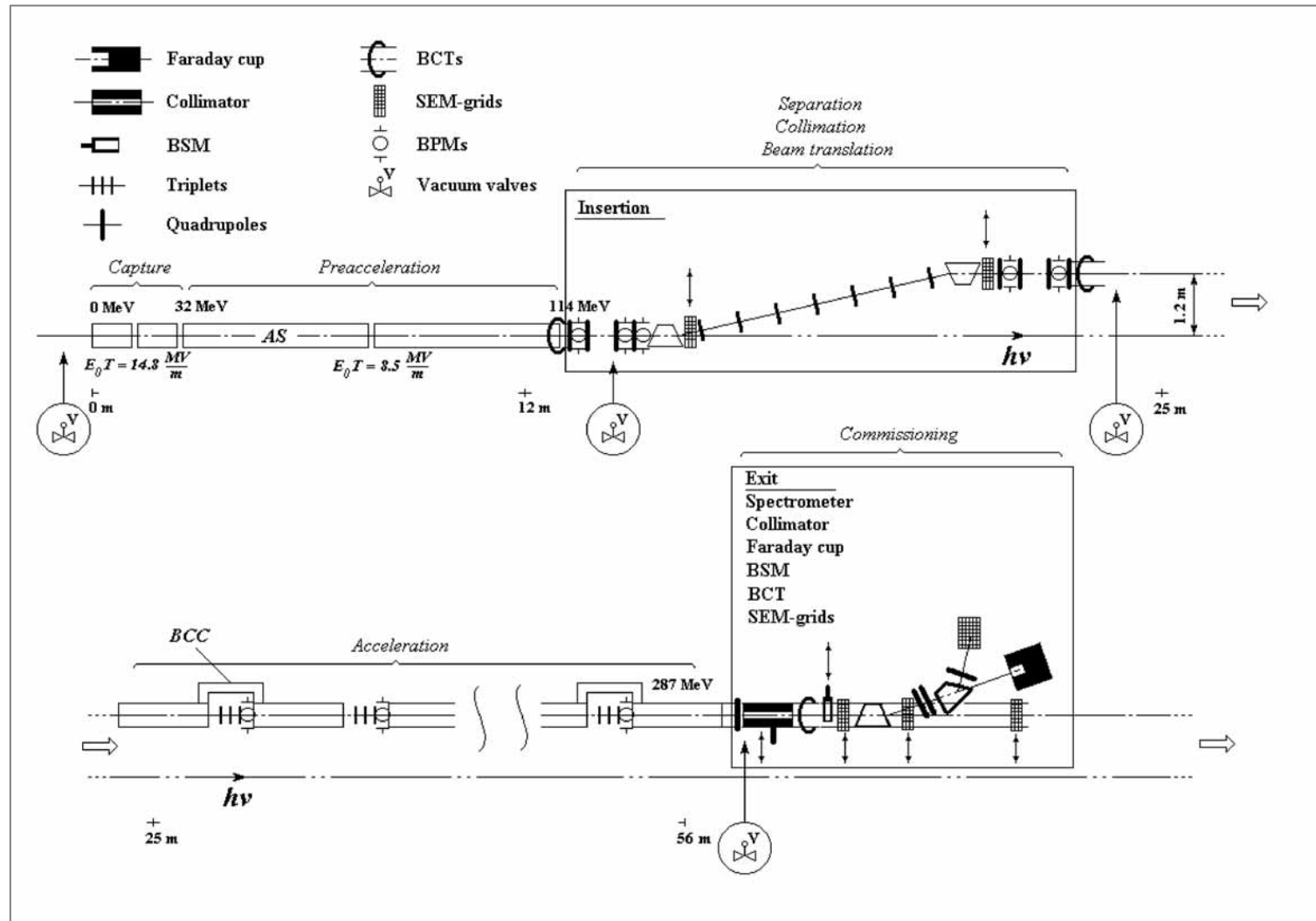
Commissioning of the main linac

- The main linac is sub-divided into 6 cryo units.
Commissioning of cryo units w. o. beam should start at the high energy end of the electron linac and proceed as the installation progresses. This requires local shielding.
 - Conditioning of couplers and klystrons.
 - First cool down and leak checks.
 - Test of all subsystems in the tunnel.
 - Final test of cavities at max. gradient, adjustment of LLRF.

Positron source commissioning with the auxiliary source

- RF conditioning of normal conducting cavities
- Commissioning of target system
- Commissioning of instrumentation and controls
- Achieving nominal capture efficiency
- Set-up collimators

Layout of the Positron Pre-Accelerator



Commissioning of the positron damping ring

- Should be easier and faster with the experience gained with the electron damping ring.
- Commissioning with electrons or auxiliary positron source not discussed in the TESLA report.
- Commissioning with the main positron source during installation of the last cryo units would be possible if the ring is located closer to the IP.