FACET·II

Facility for Advanced Accelerator Experimental Tests

FACET-II Project status

2016 FACET-II Science Workshop
October 17 - 19, 2016, SLAC National Accelerator Laboratory

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FACET-II Project Director

U.S. DEPARTMENT OF ENERGY
Office of Science

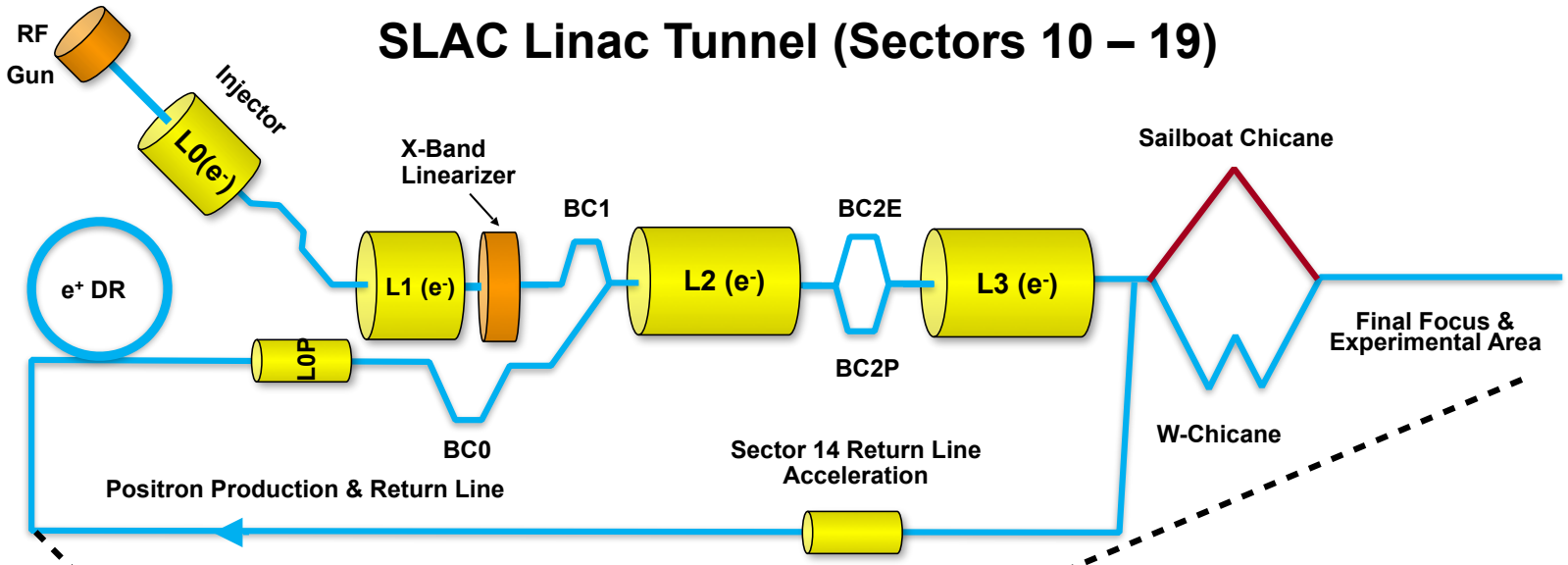
SLAC NATIONAL ACCELERATOR LABORATORY

Planning for FACET-II as a Community Resource

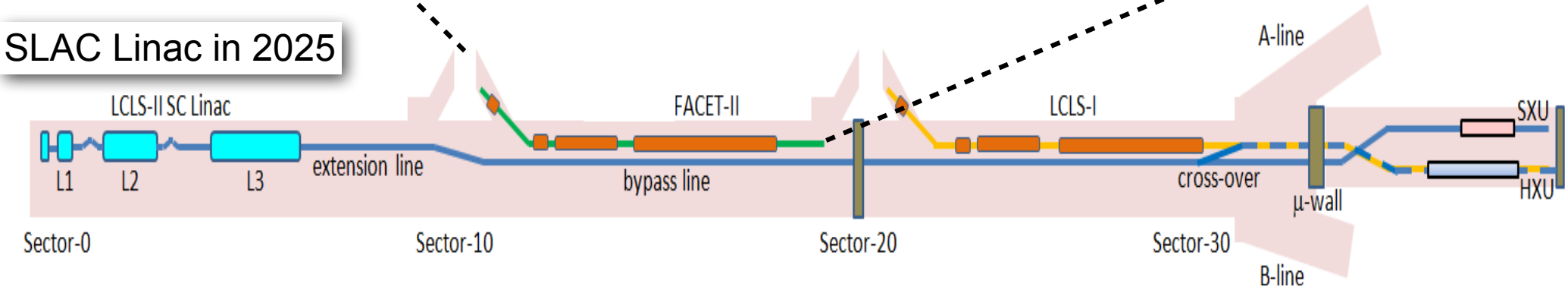
FACET-II

Photo injector
(e- beam only)
FY17-19

e+ damping ring
(e+ or e- beams)
FY19-20



SLAC Linac in 2025



FACET-II Plan

Timeline:

- Nov. 2013, FACET-II proposal, Comparative review
- CD-0 Aug. 2015
- CD-1 Oct. 2015
- CD-2/3A Sep. 2016
- CD-3B 2017
- CD-4 2022
- Experimental program (2019-2026)

Key R&D Goals:

- High brightness beam generation, preservation, characterization
- e^+ acceleration in e^- driven wakes
- Staging challenges with witness injector
- Generation of high flux gamma radiation

Three stages:

- Photoinjector (e- beam only) FY17-19
- e+ damping ring (e+ or e- beams) FY18-20
- "sailboat" chicane (e+ and e- beams)

FACET-II will enable research for a broad user community
FACET-II Science Workshops: Oct. 2015, Oct. 2016, … SLAC

Closeout Report on the DOE/SC CD-2/3a Review of the

Facility for Advanced Accelerator Experimental Tests-II (FACET-II) Project

SLAC National Accelerator Laboratory

September 13-15, 2016

Kurt Fisher
Committee Chair
Office of Science, U.S. Department of Energy
http://www.science.doe.gov/opa/

Technical Subcommittee 1:

Injector Subcommittee Recommendation

1. Prioritize the injector items on the buy-back list in term of their performance impacts on the project.

Linac and Bunch Compressors Subcommittee Recommendation

2. **Prepare a study of cost & schedule to include the sailboat chicane** should the project contingency funds allow.

Controls and Common Systems Subcommittee Recommendation

3. **Identify potential scope contingency** opportunities and closely monitor cost contingency. Target area access upgrade may be one scope option.

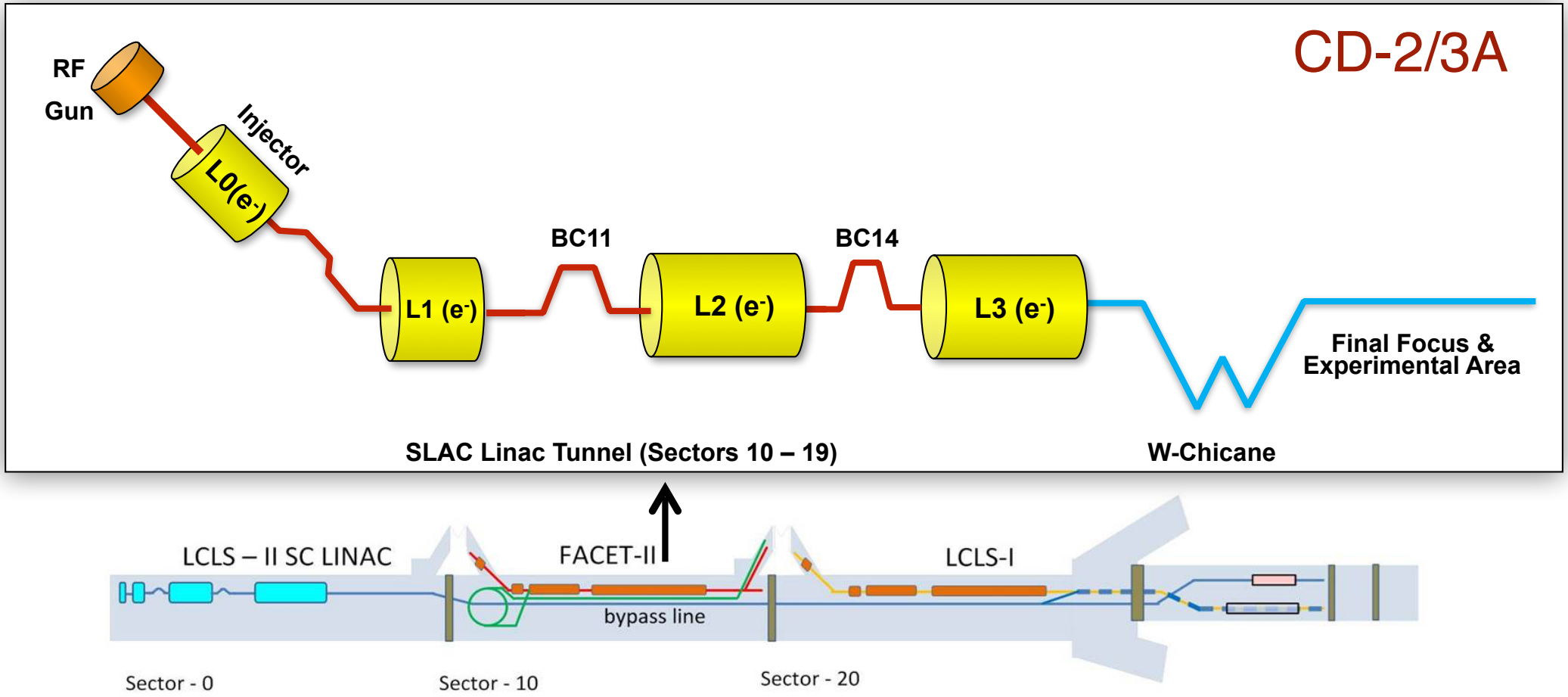
Positron Systems Subcommittee Recommendation (pre CD-3B)

4. Re-evaluate the priority for the sailboat option. The team should have a plan in place to expedite the sailboat design and implementation if the decision is made
5. Consider a possibility of improving longitudinal beam emittance by upping RF system parameters (voltage and/or frequency)
6. Identify and use an established accelerator physics code capable of simulating beam dynamics in a complex field of compact damping ring

Proceed to CD-2/3A ESAAB

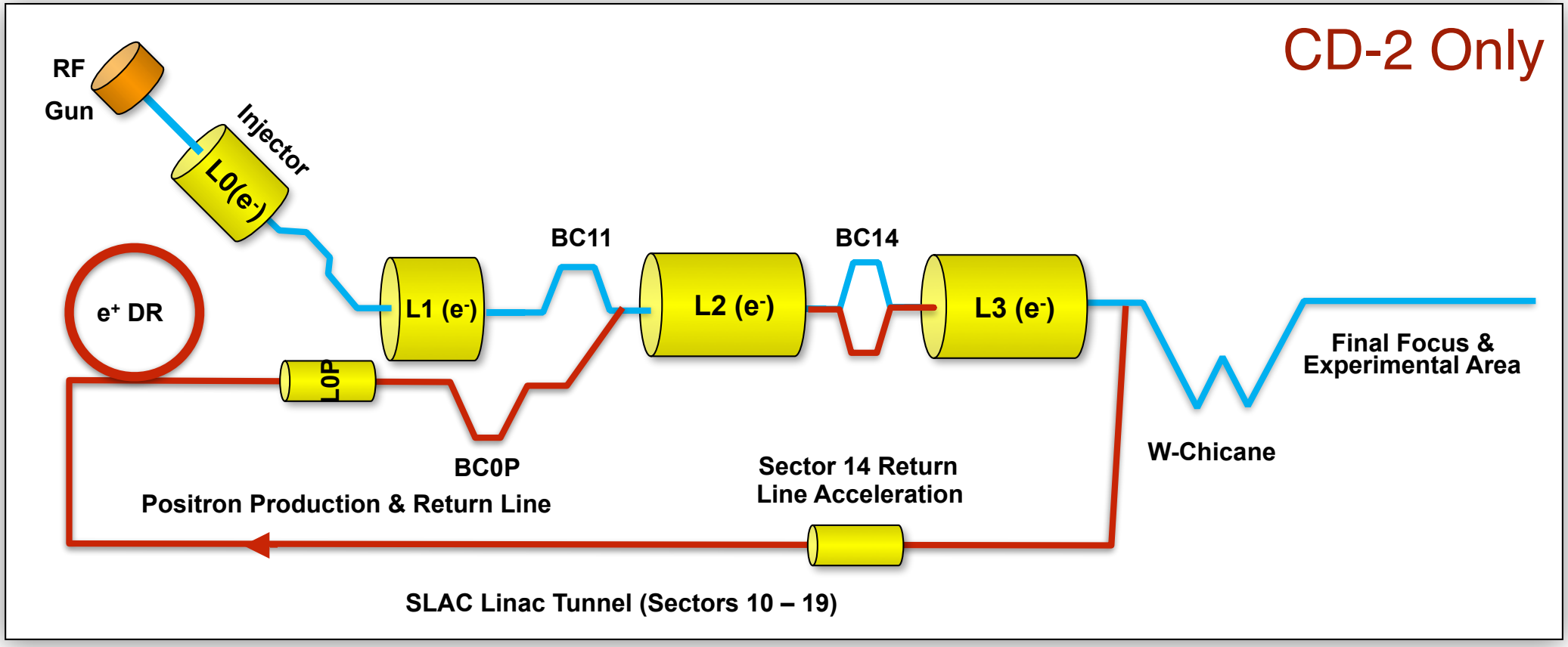
FACET-II Stage 1 FY17-19

- **Goal:** Deliver compressed electron beam from S10 to experiments in S20
- **Major upgrade:** Electron beam photoinjector in Sector 10
- **Scope**: Injector, shielding wall in S10, bunch compressors in S11 (BC11) and S14 (BC14), beam diagnostics



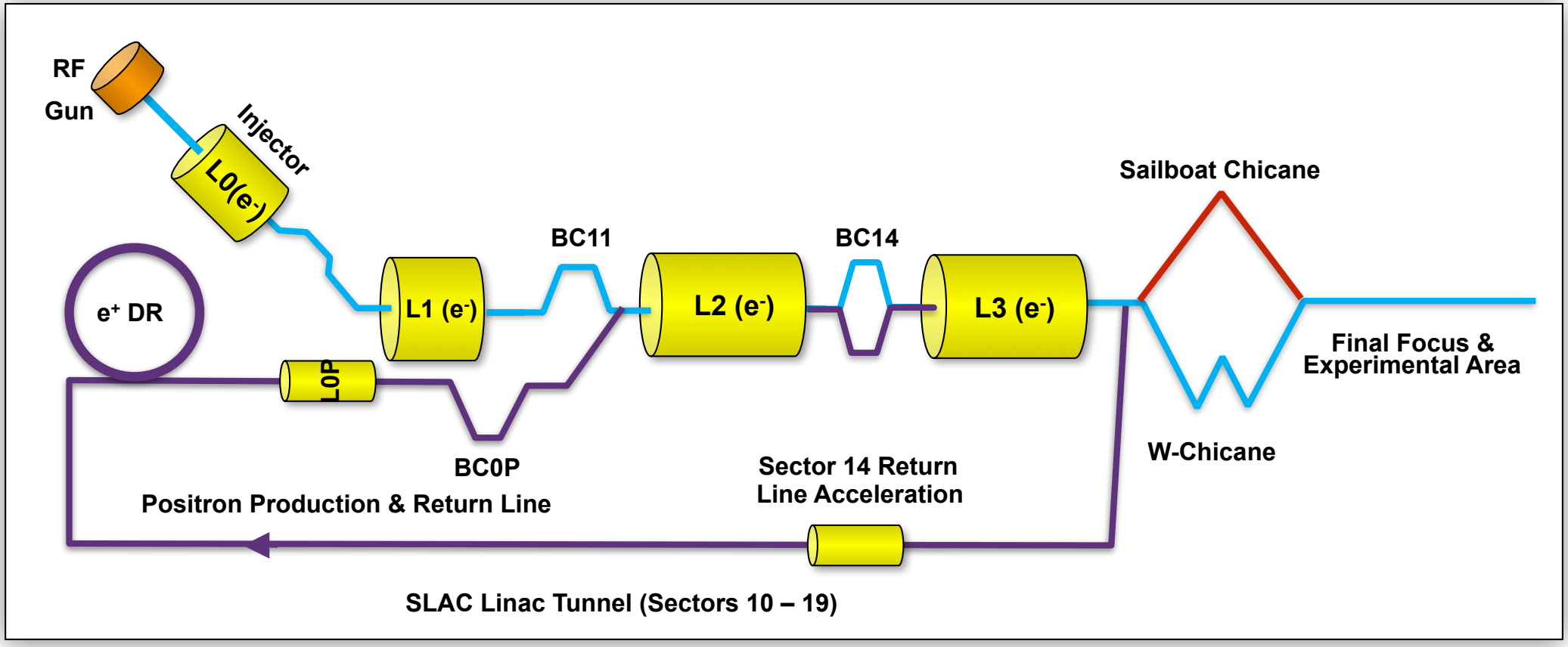
FACET-II Stage 2 FY17-20

- **Goal:** Deliver compressed electron beam from S10 to experiments in S20
- **Major upgrade:** Positron damping ring
- **Scope:** Damping ring, positron bunch compressor & return line



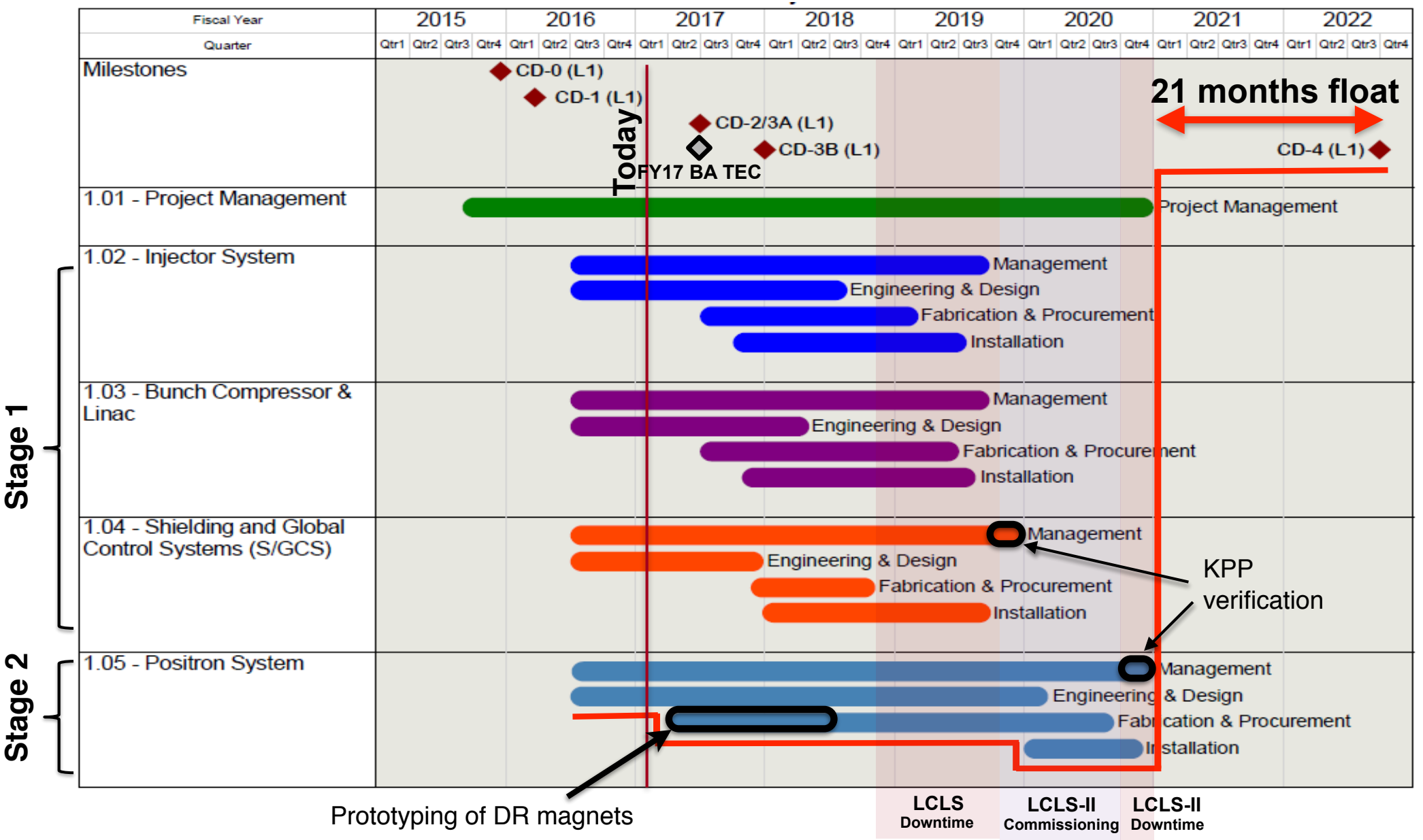
FACET-II Stage 3

- **Goal:** deliver electron and positron beams to experiments in S20
- **Major upgrade:** Sailboat chicane
- **Scope:** Sailboat chicane

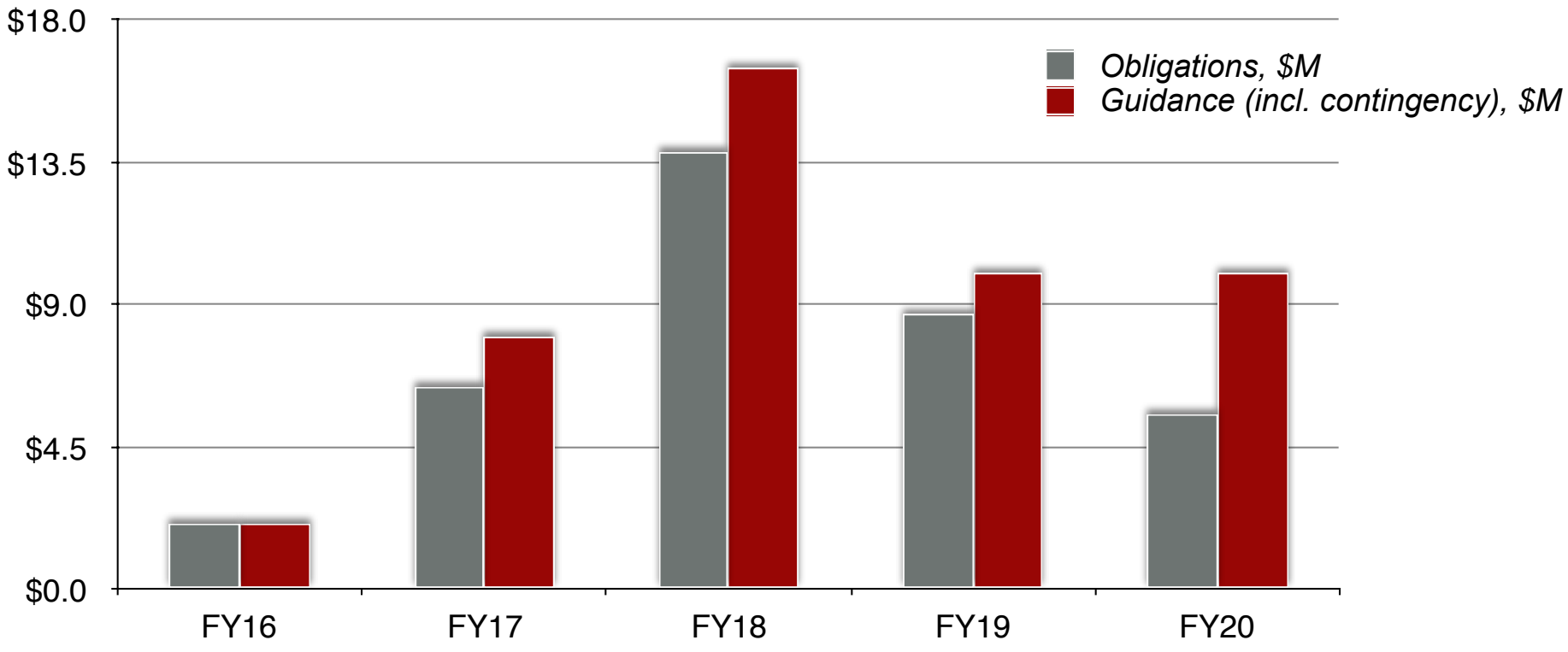


FACET-II Summary Schedule with Critical Paths

Assumes 6 month CR in FY17



FACET-II Funding Profile



		FY16	FY17	FY18	FY19	FY20	Total
Obligations,	OPC, M$	$2.1	$2.3	$0.0	$0.0	$0.0	$36.4
Obligations,	TEC, M$	$0.0	$4.1	$13.8	$8.6	$5.5	
Guidance,	OPC, M$	$2.1	$3.0	$0.0	$0.0	$0.0	$46.6
Guidance,	TEC, M$	$0.0	$5.0	$16.5	$10.0	$10.0	