Schedule / Budget / Human Resources

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KEK

Feb. 16, 2010

KEKB review committee

KEKB to SuperKEKB

- KEKB status
  - We achieved new peak luminosity record of 2.1x10^34 /cm2s with crab crossing by tuning chromatic x-y coupling with skew-sextupoles.
  - Integrated luminosity of 1000 fb-1 has been delivered to Belle, which is considered as a goal for the present KEKB.
- Nano beam
  - Following the recommendation by the last review committee, we started the design of nano-beam option for SuperKEKB.
  - In the fall of 2009, we decided to adopt this scheme, changing from the high-current scheme.
- Belle-II
  - Belle-II collaboration was established based on the Belle team, and new members are joining.

Budget allocated so far

- Besides the annual operation budget, new budget has been allocated:

- FY2009 Supplementary Budget of 25.5 Oku-Yen (1 Oku-Yen = ~1.1 M$) was allocated to KEKB for development of low-emittance beam device.
  - This budget is being used for fabricating a part of ante-chambers for the LER wiggler section, reinforcement of RF system, and R&D for key components such as IR magnets, positron source, etc.
- FY2010 a budget of 5.83 Oku-Yen was allocated for KEKB reinforcement. This single year budget is the first year of three-year plan for the Damping Ring construction in total of 25 Oku-Yen.
  - An announce was made abroad by the DG of KEK as "The Japanese Government has announced KEK's budget for JFY2010, in which preliminary approval was given to the KEKB upgrade program, and a budget was allocated to partially start construction. This does not yet constitute full approval of the overall project, but can be interpreted as a provisional decision by the Government in these difficult times of drastic change in the Japanese Government."

Committee for large-scale projects

- A committee that discusses large-scale achademic projects was established last year under Science and Technology, Academic Council in MEXT.
  - The committee discusses ways to promote large-scale achademic projects in Japan.
  - Roadmap in each research field is being discussed in the Sience Council of Japan, which will be submitted to the committee. The committee will discuss and settle on the roadmap. The committee is to decide which projects to be pushed forward in coming years.
  - The decision will be made by this summer, hopefully.

Presuppositions

- We present fastest possible schedule with following presuppositions:
  - Not a small part of budget allocated to KEK in JFY2010 be assigned to KEKB upgrade by the KEK Executive Board.
  - Positive decision be made by the committee for large-scale projects in MEXT by this summer.
  - Budget for the Damping Ring tunnel and buildings be allocated in JFY2011 by the Japanese Government.
  - Full approval of the overall project, SuperKEKB, be made in JFY2011 by the Japanese Government.

Injector upgrade and DR construction schedule

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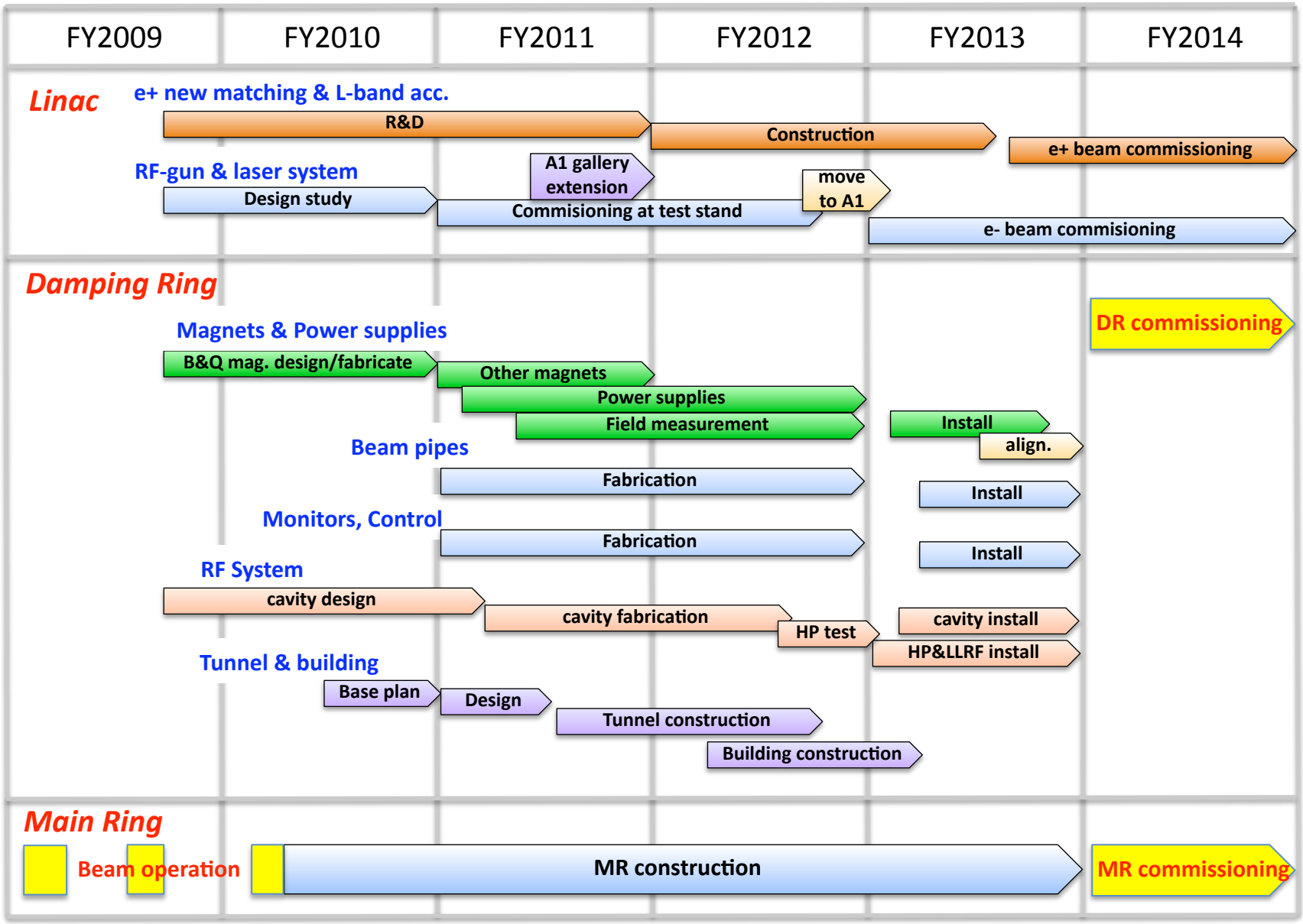

SuperKEKB Main Ring schedule

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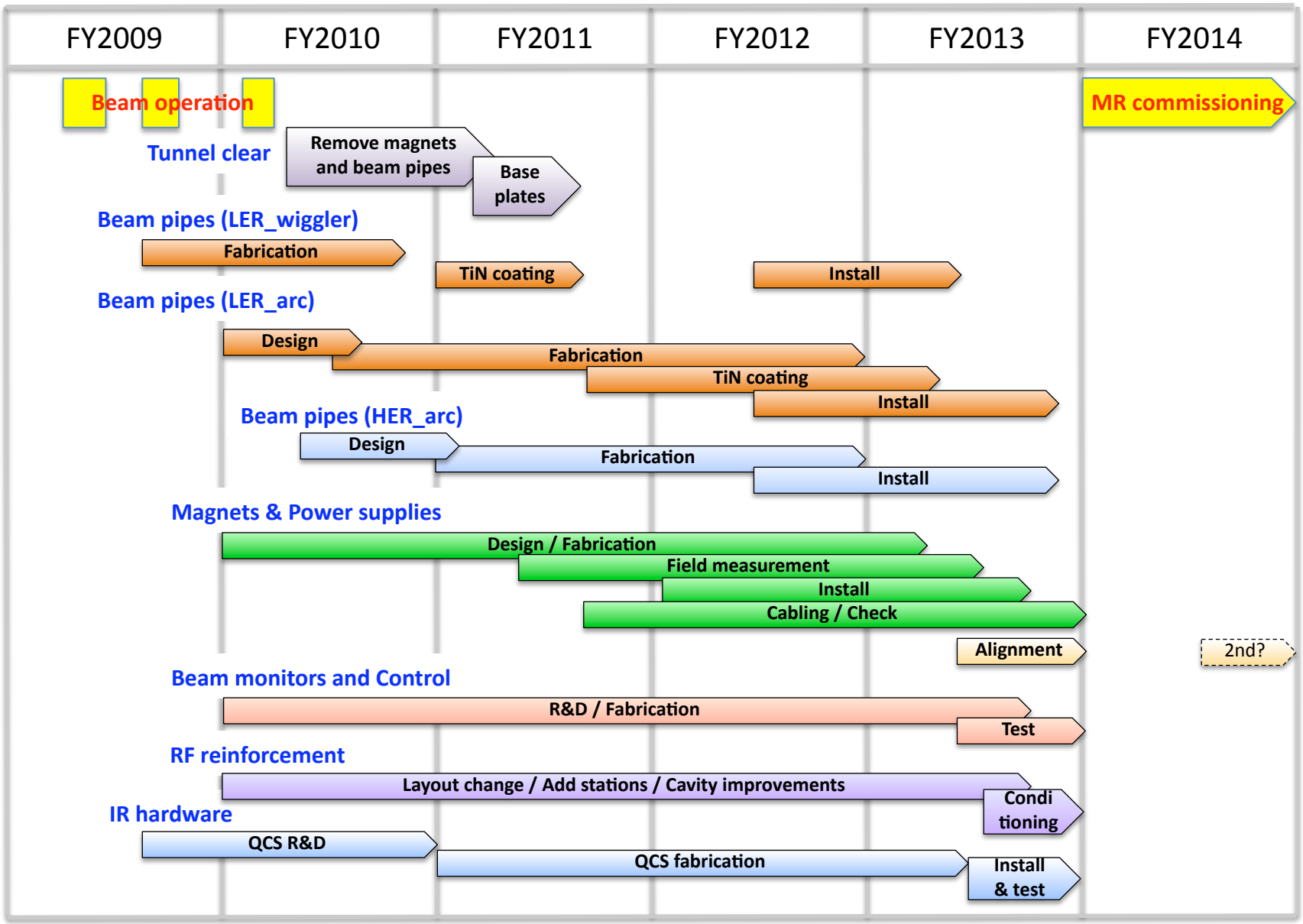

Cost estimation

1 (Oku-Yen) = 1.1 M USD = 0.8 M EUR (as of 12 Feb, 2010)

Components	Cost (Oku-Yen)	Remarks
Linac upgrade and Damping Ring	31	e+ matching and L-band acc., RF-gun and laser system, Damping Ring components
Vacuum System	135	beam pipes (ante-chambers, electrodes, etc), pumps and other vacuum components for 3km x 2 rings
Magnet System	93	magnets, power supplies, cables
IR upgrade	20	QCS and other hardware
RF System	25	add 9 RF stations, improve cavities (coupler, HOM damper)
Beam monitor and control	32	BPM, SRM, feedback, control system, etc.
Belle upgrade	14.7	
Total	350.7	

- Cost for DR tunnel construction is not included in the list. Also cost for buildings and facilities for Linac, DR and MR is not included. These costs are about 30 Oku-Yen in total.
- This list is what went to MEXT last year. According to recent estimation, cost for some components increases, but some others decrease.

Human Resources

If no persons are added (with present staff only), about 30 FTE would be short for construction.

Date	Status	FTE needed (A)	FTE available (B)	Reason for (B)	FTE short (A) - (B)
Feb. 2010 (present)	before construction		57.4		
Apr. 2013	under construction	81.5	47.9	9.5 to be retired	33.6
Apr. 2015	1 year after commissioning	70.0	39.9	17.5 to be retired	30.1

- About this table
  - Needed FTE is estimated based on the number of working staff during KEKB construction.
  - The HR for the Linac is not included in the list.
  - Similar estimates were done in the Accelerator Laboratory. The result shows 78 FTE short in total (107 short as of Apr. 2013) if all projects written in the KEK roadmap be persued at the same time.
- How to fill the short FTE?
  - New persons? (usually only a few persons are newly hired each year in the whole Accelerator Laboratory.)
  - What we can do in the Accelerator Laboratory is being discussed.
  - Will priority among many projects in KEK be clearly defined?

Summary

- Schedule
  - KEKB and Linac team prepare for the fastest possible schedule, where SuperKEKB commissioning start at the beggining of JFY2014.
- Budget
  - Budget plan is presented. We will refine it as the design progresses.
- Human Resources
  - About 30 FTE is short for SuperKEKB construction. We have no clear answer at this moment, but anyway we must solve it.