

15th J-PARC PAC meeting

1. Status report
2. Mandate to the J-PRAC PAC meeting

July 13, 2012

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KEK/IPNS

What happened after the last PAC meeting (1)

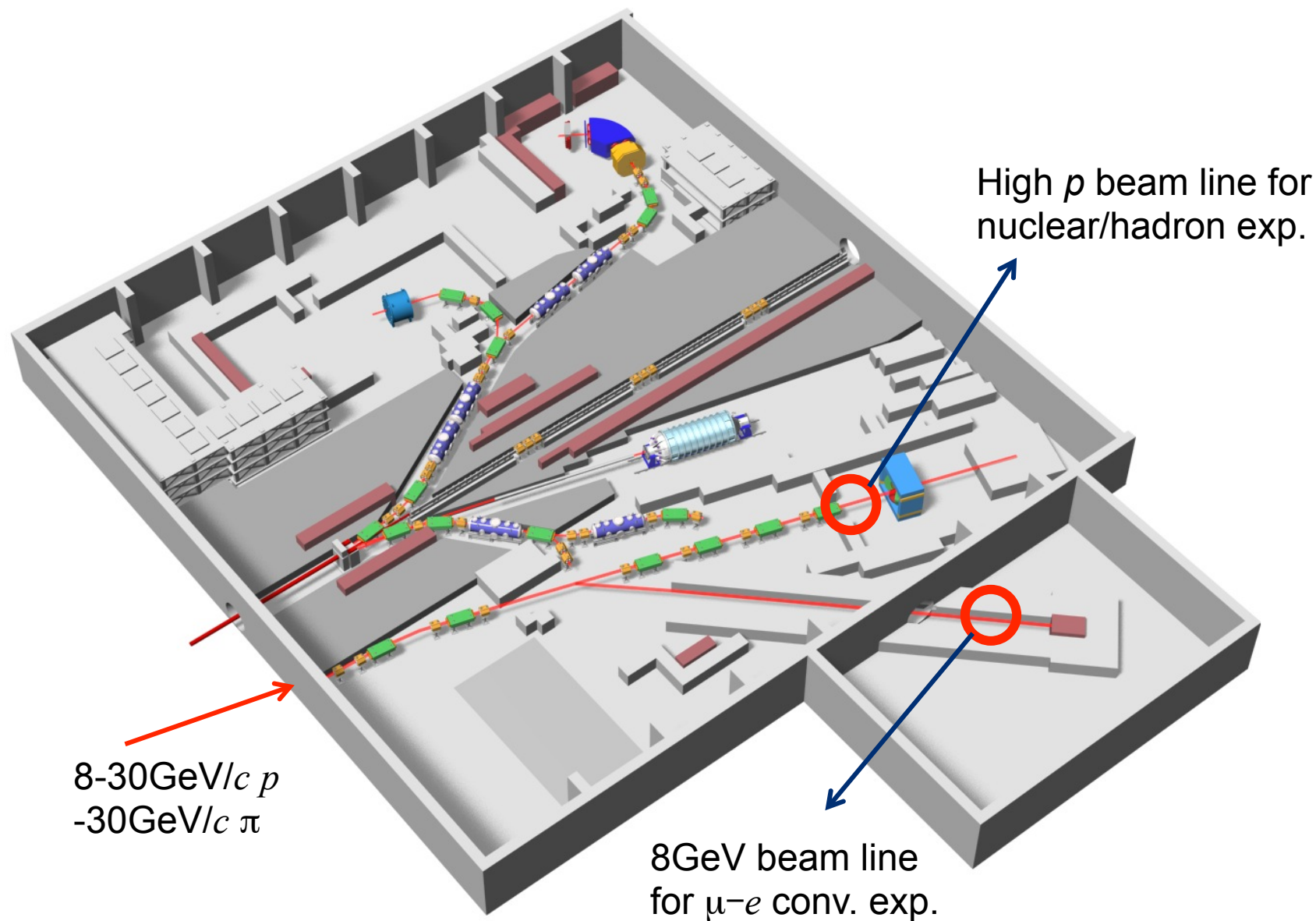
- Review by the governmental committee (March-May 2012)
 - Synergy between hadron experiments, SPring-8 experiment and “京(kei)” computing facility was positively evaluated.
 - First observation of ν_e appearance
 - Particle and nuclear physics program has been conducted in efficient way.
 - Proposed future plan in the next five years:
 - 1. Accelerator upgrade to reach design performance
 - Higher rep. rate for FX
 - Small beam loss and high duty factor beam for SX
 - 2. A package of high-p beam line and COMET beam line
 - The committee report says:
 - It is urgent to achieve 750kW(ν)/100kW(SX).
 - It is also urgent to construct high-p and COMET beam lines because of the international competition.
 - It is efficient to construct those two beam lines, because they share common beam line in the upstream.

What happened after the last PAC meeting (2)

- Budget request for JFY2013
 - Assume that accelerator upgrade will start from JFY2014.
 - Request “high-P and COMET” package
 - 7.7 Oku JPY in the first year, 40 in total
- Run between the last PAC meeting and end of June.



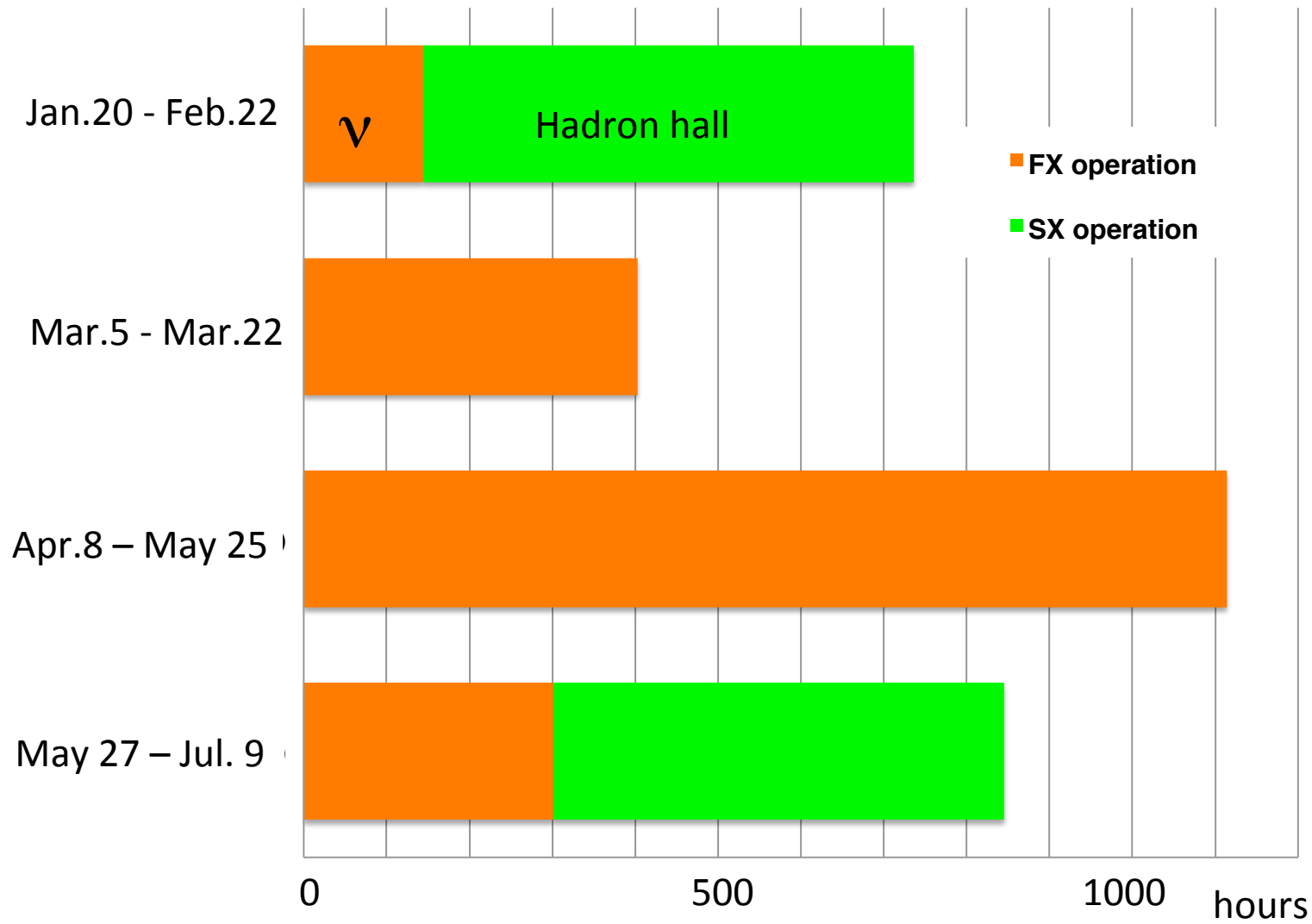
New Primary Beam Lines



High-p and COMET

- After a long and difficult discussion, we concluded to give a priority to COMET among the possible muon experiments at J-PARC.
- E16 (Vector meson mass shift) is the only stage-1 experiment at the High-p line. We started a series of workshops to exploit physics case of this new facility.

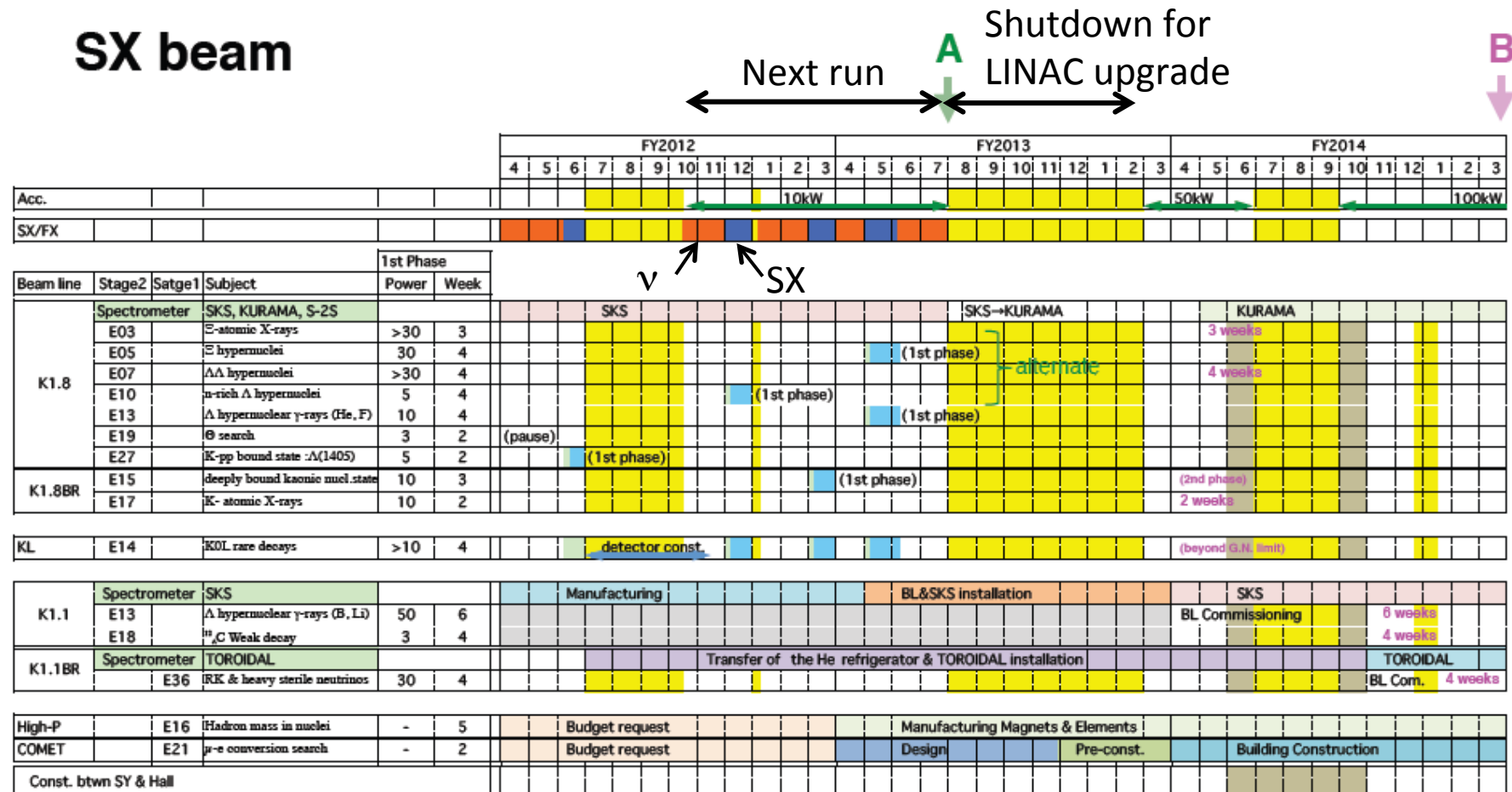
MR operation [hours] ... including Tuning, User time, Study & Trouble.



Run plan Fall 2012-Summer 2013

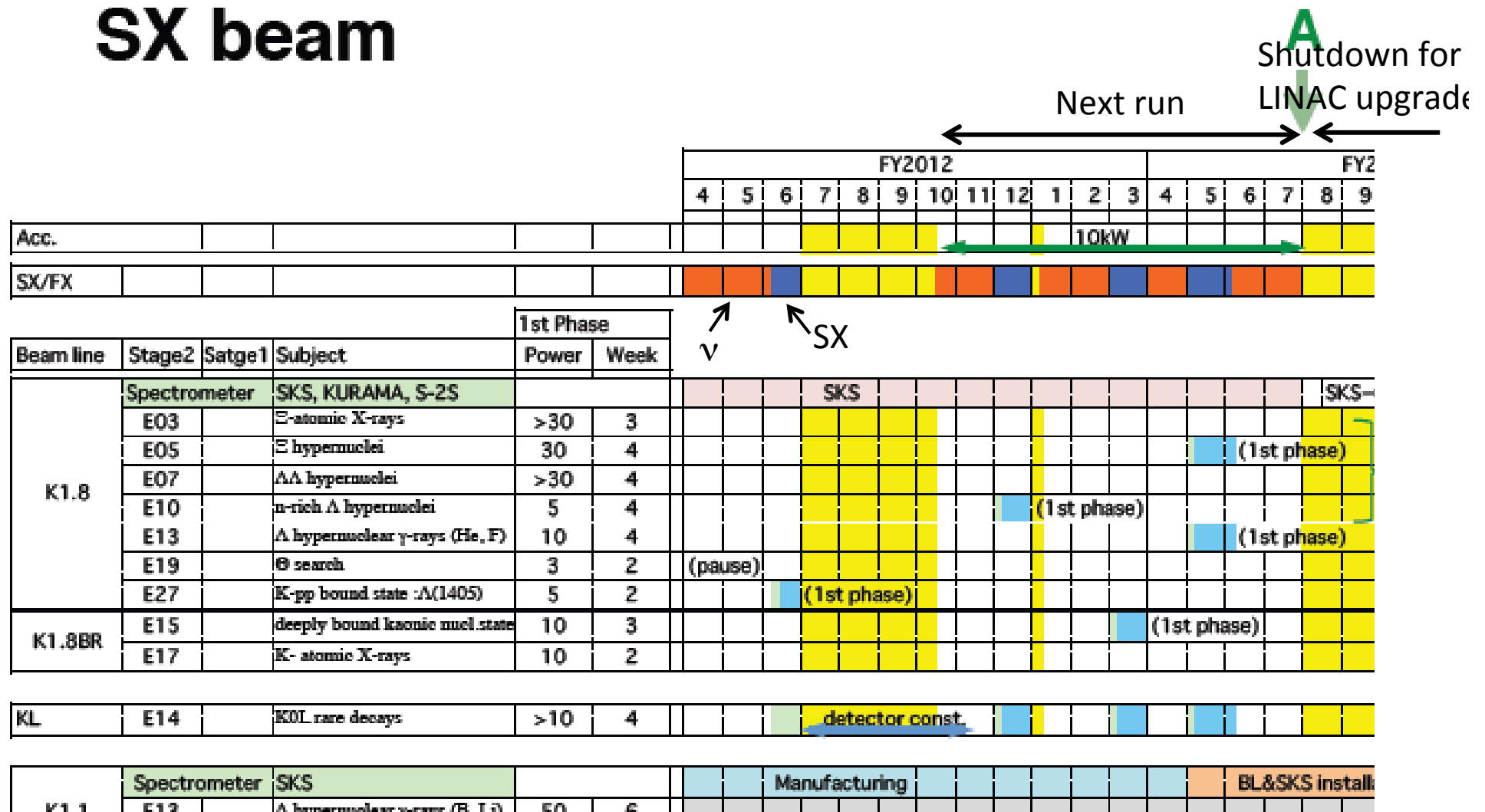
- T2K still has a higher priority to achieve 5σ test of ν_e appearance, BEFORE NO ν A seriously joins the competition.
- It is our responsibility to deliver beam to the hadron experiments in the long queue.
- As a solution to satisfy these requirements, we propose to increase the MR machine time by 1.5 months by:
 - Shorten shutdown in the end/beginning of the year.
 - Summer shutdown will be delayed to August.

SX beam



Run plan in fall 2012 and later

SX beam



Mandate of the PAC at this meeting

From the first PAC meeting

- Stage-1 approval will be given by the IPNS director based on the recommendation of the PAC, **if the scientific merit of the proposal is high and the experimental methods are sound.** This approval will help the proponents negotiate with funding agencies.
- After stage-1 approval, the PAC will judge the feasibility of the experiment and gives a recommendation for a stage-2 approval to the IPNS director. The feasibility judgment will be based on the **technical achievability, the reliability of the cost estimate and the manpower allocations.** If necessary, after the stage-1 approval, the IPNS director can ask the Facilities Impact and Finance Committee (FIFC), which is a new committee to be setup under the IPNS director, to evaluate the various aspects of the feasibility with respect to the Laboratories program. Based on this information, a stage-2 approval may be given by the IPNS director through the J-PARC center to the proponents, based on the recommendation of the PAC and consideration of the financial situation. The second stage approval is a green light for the experiment to proceed.

Stage-1 Letter from IPNS

“ (Brief description of the PAC recommendation comes first.)

Following the recommendation by the PAC, we assign stage-1 status to the proposed experiment. The following benefits result from stage-1 recognition of the proposal:

- A. Members may register as J-PARC users and radiation workers.
- B. Limited support will be provided to domestic travel to J-PARC.
- C. Detector R&D may be partially supported by IPNS.
- D. Collaboration can request for offices, work space for R&D, and resource including electricity, cooling water, crane etc.

It should be noted, however, that this recognition does *not* imply automatic or final approval of the experiment."

E31 (Hyperon below KN threshold, K1.8BR): requesting Stage-2

- Examine the technical feasibility and resource plan.
- Recommend Stage-2, if the committee finds that the proposed experiment has good technical feasibility and appropriate resources.
- Possible issues
 - Timing of the experiment: it is better if E15 and E17 are done in prior to this experiment. Possible timing will be early 2014 or later.
 - Beam power × weeks?

P36 (Lepton flavor universality, K1.1BR): requesting Stage-1

- The PAC endorsed physics merit of this proposal in the previous meetings.
- Examine if the proponents have reasonable plan to carry out this experiment in early 2015, when will have a limited time slot to do experiment at K1.1BR.
- The proponents requested IPNS to transport cryogenic system to the hadron hall. We are ready to support this, if PAC finds that they have sufficient resources to prepare for the detector of this experiment before 2015.

E21 (COMET): Proposal revised

- COMET has received State-1 status, while the collaboration proposes sizable change to the original proposal.
- We hope COMET to be incarnated in timely way to compete with Mu2e.
- We support the two stage approach as a practical way to accomplish improvement of four orders-of-magnitude compared with the existing upper limit.
- We will conduct detailed design review of COMET as soon as they become to be ready to be reviewed.
- The PAC is requested to give critical comments to the concept, technical design, resource plan, and so on, of this proposal.

P41 (DeeMe): Requesting Stage-1

- The PAC asked technical questions to the proponents in the meeting in January 2012, which will be answered at this meeting.
- Expected sensitivity of this experiment is a few times lower than that of COMET phase-1, which will show up slightly after DeeMe, if both go as scheduled.
- We suggested the proponents to join COMET. What do you think?

P42 (H-Dibaryon): Requesting Stage-1

- The PAC asked physics and technical questions to the proponents in the meeting in January 2012, which will be answered at this meeting. Examine them and consider it for Stage-1 recommendation.

P45 (Three body reaction): requesting Stage-1

- This is a new proposal. Examine scientific merit and possibility of this experiment.
- Note that the proponents will use the TPC being designed for P42(H-Dibaryon).

E34 ($g_\mu-2/\mu$ EDM):

- After a long and difficult discussion, we decided to give a priority to COMET among the possible muon experiments at J-PARC.
- We extensively continue R&D for $g-2/\text{EDM}$, and aim at a next opportunity of funding.

Summary of the mandate

- Examine the following proposals
 - E31 (Hyperon below KN threshold, K1.8BR)
 - P36 (Lepton flavor universality, K1.1BR)
 - P42 (H-Dibaryon)
 - P45 (Three body reaction)
 - E21 (COMET)
 - P41 (DeeMe)
- Do you endorse the run plan in Fall 12-Summer 13?
- Give any comments to the experimental program at J-PARC.