Thoughts on Industrialization in Japan

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Industrialization in Japan (KEK to Industry)

Accelerator technology transfer to industry

For Main Linac System
  (cryomodules, klystrons, modulators, waveguides, LLRF)

1. KEK technologies for ILC production, any problems?
   Any patents? : maybe NO.
   Technology transfer? : done by close contact between KEK and Industries
     KEK creates conceptual design, system design, electrical&mechanical design.
     Detail design & drawings are made by Industry by close discussion with KEK.

2. Industry technologies for ILC, any problems?
   Possibility to open industry technology? : maybe NO.
   Industry will hold the detail drawings, as usual in Japan.
3. Any specialty of ILC production?
   How KEK support production quality? :
   KEK expert staying in company.
   Make continuous feedback to the line.

   How KEK support mass-production line? :
   KEK will invest to the special production line.
   cavity vertical test lines in KEK.
   module assembly & test lines in KEK.
   big storage in KEK.

   “situation is different product by product.”

4. What is the work boundary between KEK and Industry?
Mass-production in Asia

- Shared by 3 regions, in 5 years (5 x 235 working days).

- **Total:** 15000 cavities, 1500 modules, 750 klystrons, 750 modulators.

  in Asia: 5000 cavities, 500 modules, 250 klystrons, 250 modulators.

**For example**

Production in Asia: (1175 working days)
- cavities: 5000 (4.3/day/company) 10 companies has 5 lines each -> 1 cavity / 12 days
- modules: 500 (0.4/day/company) 5 companies has 2 lines each -> 1 module / 24 days
- klystrons: 250 (0.2/day/company) 2 companies has 3 lines each -> 1 klystron / 28 days
- modulators: 250 (0.2/day/company) 3 companies has 2 lines each -> 1 modulator / 28 days