

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?

Any patents? : EP process patent, and maybe many fabrication patents.

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.

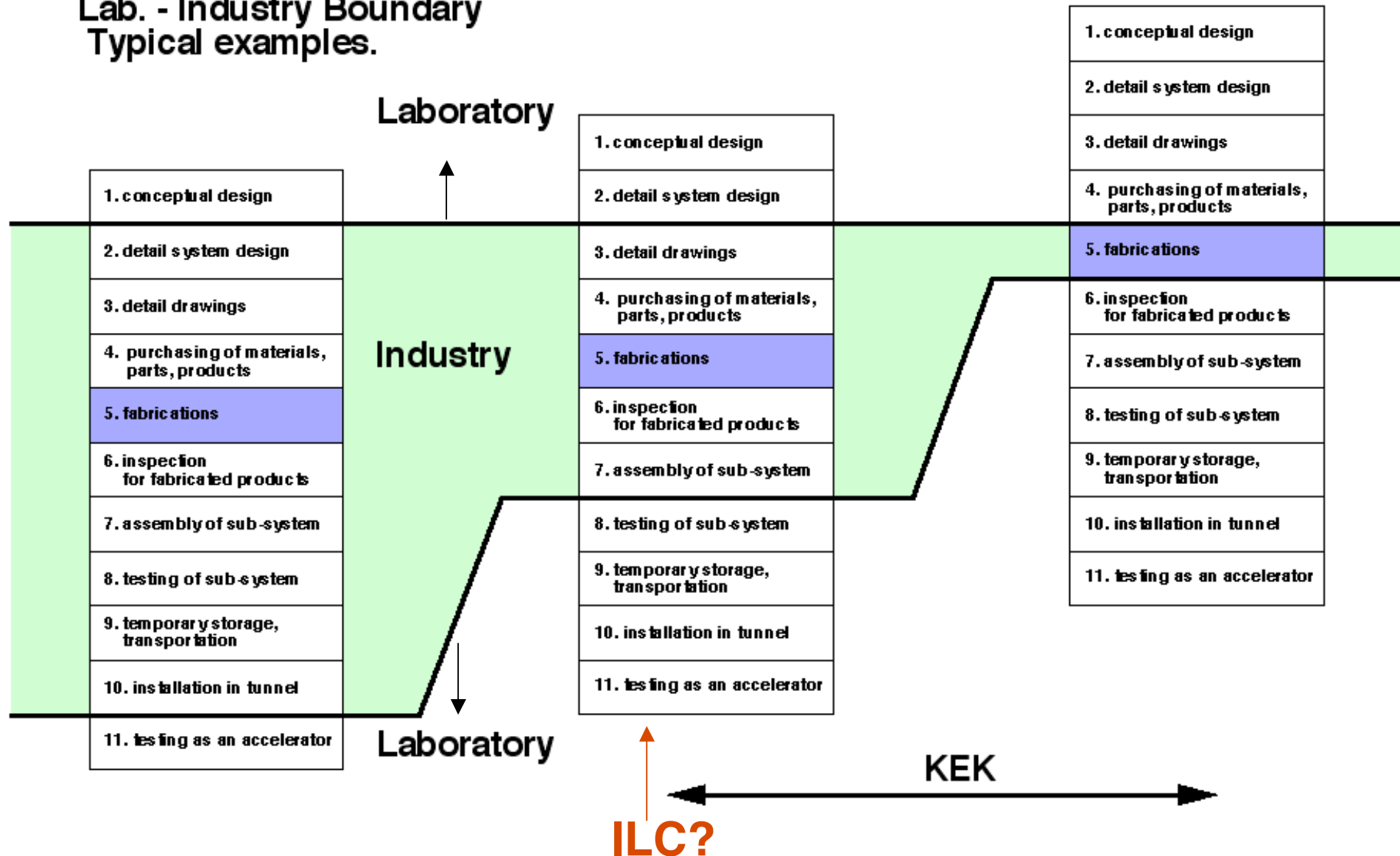
big storage in KEK.

“situation is different product by product.”

4. What is the work boundary between KEK and Industry?

Boundary of Laboratory - Industry

Lab. - Industry Boundary
Typical examples.



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 modulat / 28 days