J-PARC Status

*** Try to enhance
updates in the last 1 year**
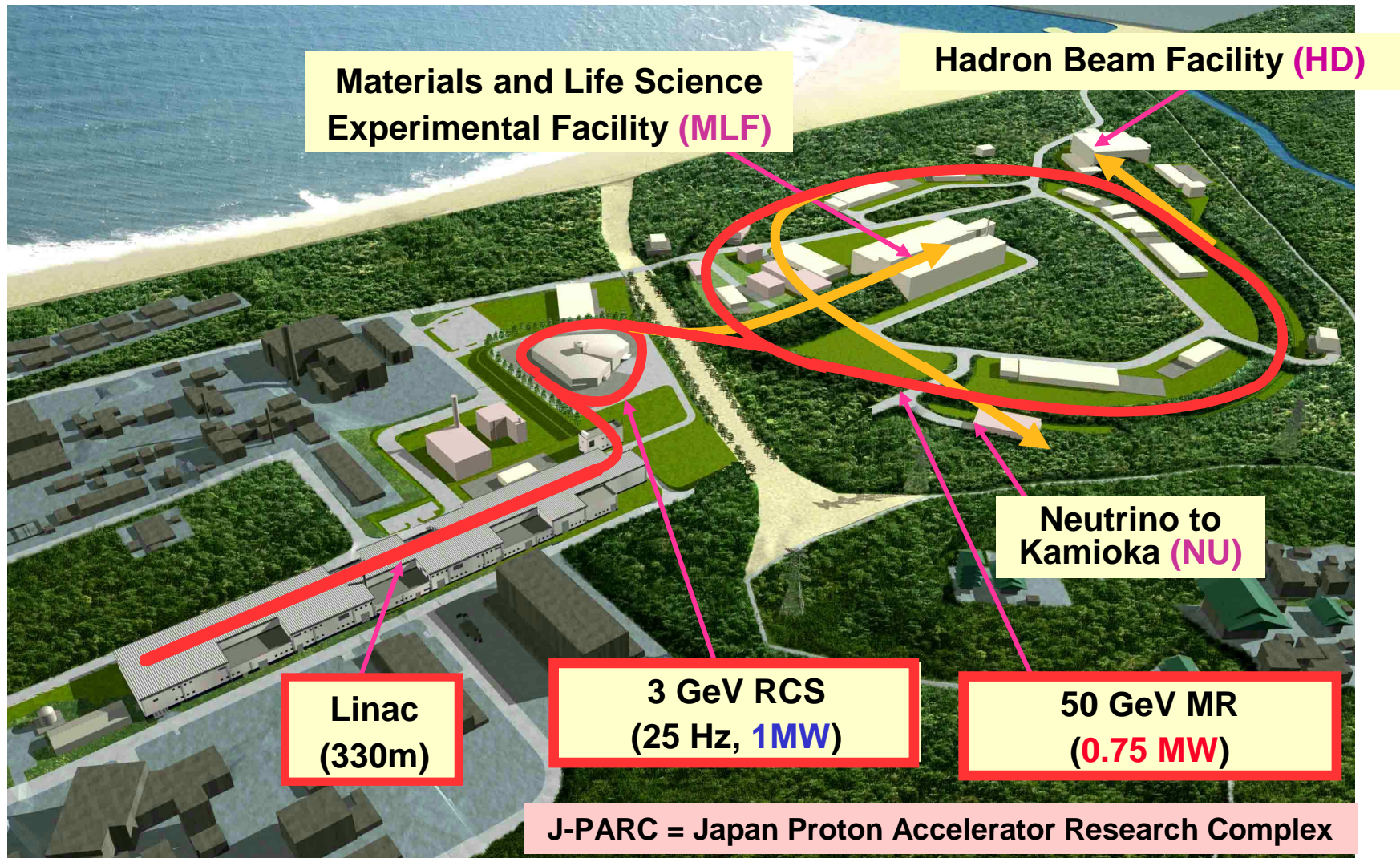
N. Kamikubota, KEK

and J-PARC Control members

EPICS at APS in June.2006, n.kami, KEK

J-PARC

- **Japan Proton Accelerator Research Complex**

- **A joint project between JAEA* and KEK**

  *JAEA – Japan Atomic Energy Agency, formerly JAERI

- **Under construction in JAEA in Tokai#, Ibaraki, Japan**

  #Tokai is 60km NE of KEK-Tsukuba, 130km NE of Tokyo

J-PARC Facility

Materials and Life Science Experimental Facility (MLF)

Hadron Beam Facility (HD)

Neutrino to Kamioka (NU)

Linac (330m)

3 GeV RCS (25 Hz, 1MW)

50 GeV MR (0.75 MW)

J-PARC = Japan Proton Accelerator Research Complex
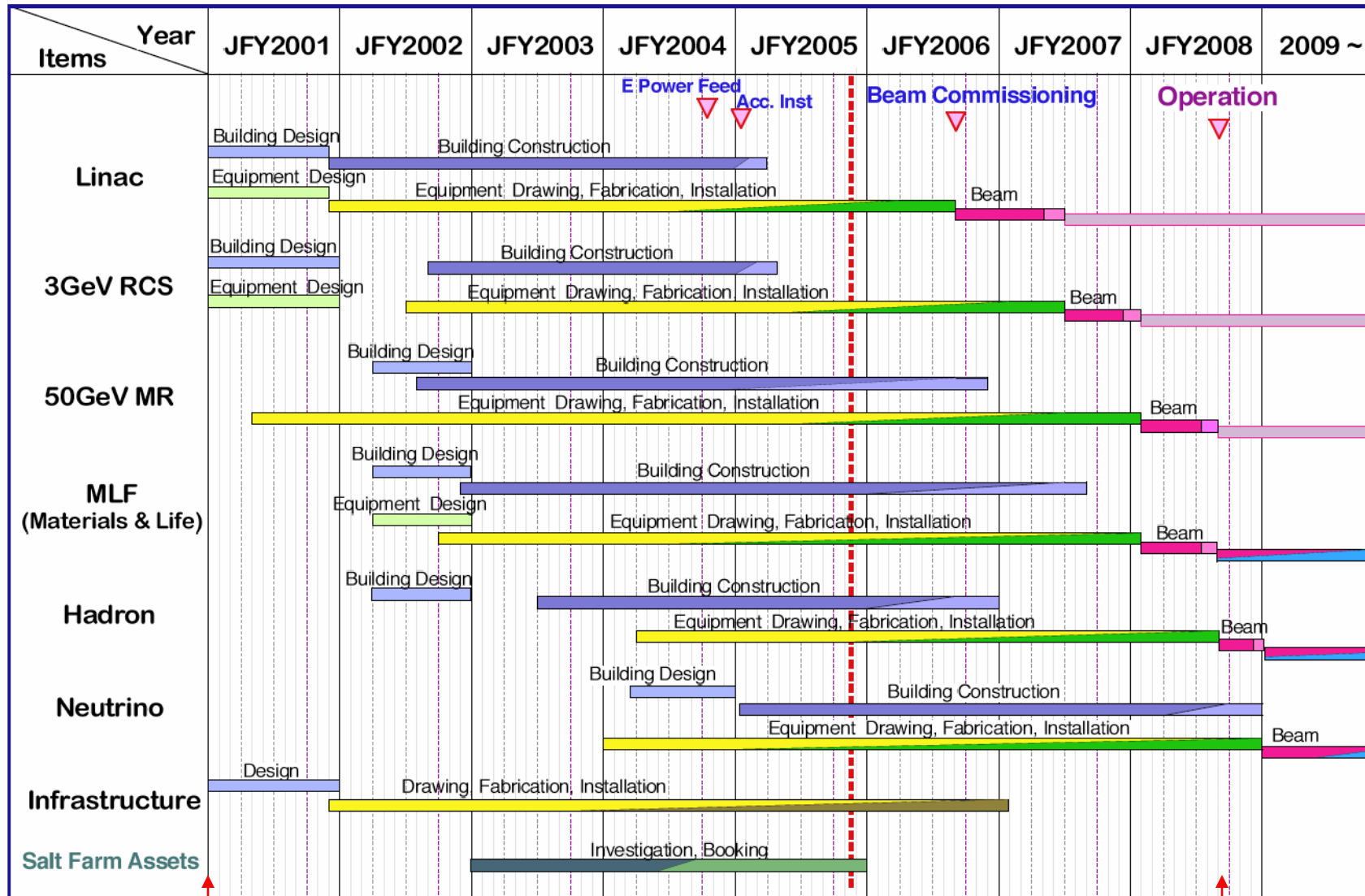
J-PARC Schedule

- **2002 - Construction started in JAEA-Tokai**

- **Oct.2006**

  Linac - Various tests without beam

- **Dec.2006**

  Linac - Beam operation will be started

- **Oct.2007**

  3GeV RCS - Beam operation

- **May.2008**

  50GeV MR - Beam operation

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J-PARC Construction Schedule

Feb. 27 2006

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Accelerator

Progress in the Recent 1-year

- **Linac**
  - H/W components have been installed
  - S/W **basic applications** are under development

- **3GeV RCS**
  - Building construction completed
  - H/W **installation** started

- **50GeV MR**
  - [East] H/W **installation** started
  - [West] Building **construction** still continues

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Linac - 1 year Progress

(May, 2005)

(February, 2006)

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50GeV MR - Magnet Installation

Started in Nov. 2005

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Control System

J-PARC Control

- **EPICS based, uses version 3.14.7**
- **Collaboration between JAEA & KEK**
  - **JAEA: LINAC & RCS**
  - **KEK: MR**

Accelerator	IOC		I/O
	HW	OS etc.	
Linac and 3GeV RCS	VME (~65,~25)	VxWorks PowerPC Adv7501 *	VME Modules, PLC, EMB-LAN, WE7000,WER
50GeV MR	VME (~50)	Linux Intel-based VMIC 7807 **	PLC, BPMC, WE7000, EMB-LAN (Network devices)

- * Advanet Company (Japan)
- ** GE/Funac Company , not decided yet

J-PARC Control (cont.)

- **Software Development**
  - **JAEA:** use Java extensively for OPI
  - **KEK:** use OPI tools of KEKB

Accelerator	OPI Application Basic	High-level	Drivers (past works before 2005)
Linac and 3GeV RCS	**Java**	**XAL** jSAD	- **VME I/O Modules** mainly by Advanet - **TeraDev** for PLC with **state-transition** idea
50GeV MR	**MEDM** (or EDM)	**SAD** Python	**(Network devices)** -**NetDev** for PLC, BPMC, EMB-LAN -**WE7000** drivers

- "**XAL** or **SAD** or **both** ?" This is a recent hot topic.
- **jSAD** is a SAD interpreter written in Java by JAEA

J-PARC Control (cont.)

- **RDB (PostgreSQL 7/8)**
  - **Goal is - automatic generation of :**
    - **EPICS run-time db**
    - **Config. files for Java-based OPI applications**
  - **JAEA**
    - **developed a schema for LINAC & 3GeV RCS**
    - **Tested in the L3BT subsystem**
  - **KEK**
    - **try to re-use it to generate EPICS db parameter files (dbprm) for 50GeV MR**

L3BT Control Test

- **L3BT – Linac to 3GeV Beam Transport**
  - **Magnets** (5 Bend, 70 Q, 55 Steer) by **VME IO** modules
  - **Vacuum** (Valve control) by 7 **PLCs**

- **Online Control without beam**
  - **Nov.2005-Feb.2006** by **JAEA** team
  - **EPICS 3.14.7** and **10 IOCs** (VxWorks 5.5.1)
  - **2157** PVs for **magnets**, **906** PVs for **vacuum**
  - **Linux** PCs were used as **OPI**s

L3BT Control Test (cont.)

Nov.2005

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L3BT Control test - RDB

Java-based OPI
Application

PostgreSQL Manager
(Commercial)

Windows-PC

Read configuration

Channel Access

OPI Config file

Database Structure development
Save control information into RDB

Generate config files for specified subsystem

IOC

Download to IOC

RDB engine
-PostgreSQL-
Linux-PC

Java Application

EPICS
Run-time DB

Record requirement for a specified IOC
Generate all *.db files for a set of IOC

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L3BT Control Test - Java OPI

Based on Java (the OPI definition files generated by RDB)

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L3BT Control Test - RDB (cont.)
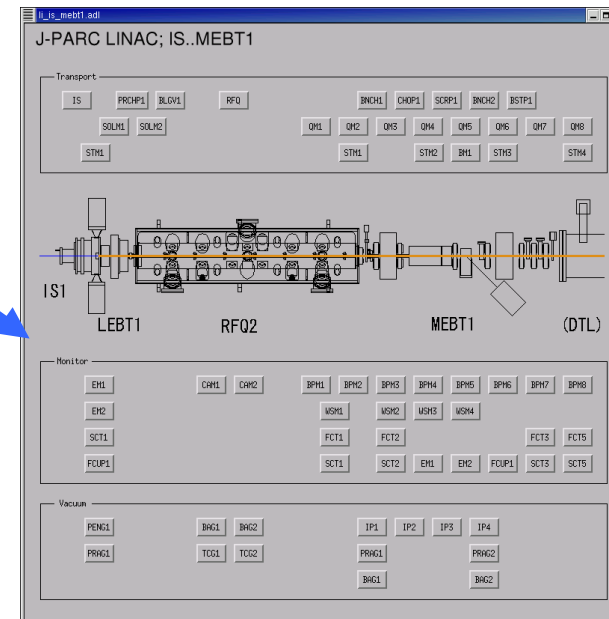

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J-PARC Control (cont.)

- **Toward the Linac Beam Commissioning (Dec.2006)**
    - **Java-based OPI and RDB have been implemented by JAEA team**
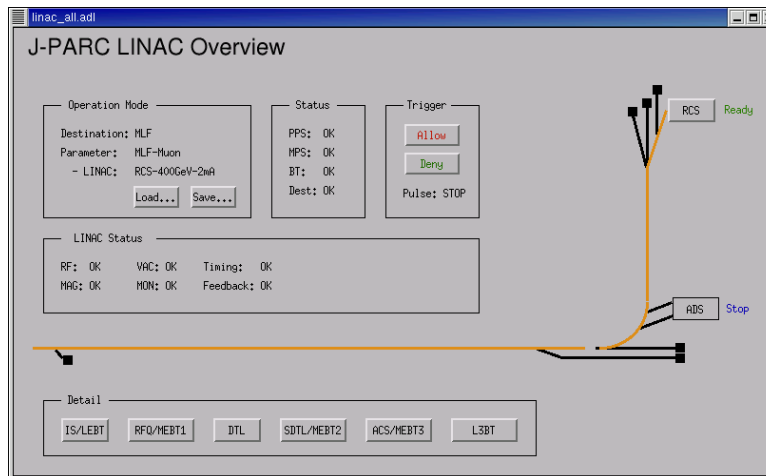
**Launcher software
dedicated for J-PARC Linac**

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J-PARC Control (cont.)

- **Recent Activities by KEK Team**
  - 2005: Moved from Tsukuba to Tokai
  - Discussion with 50GeV MR device groups
    - To determine device I/F in detail
  - RDB for 50GeV MR – R&D started

- Announce: Man-power of KEK team

  - Nov.2005: J.Odagiri moved from KEKB to J-PARC

  - Jan.2006: N.Yamamoto moved from KEKB to J-PARC

Bit More ..

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Better to know about J-PARC

- **J-PARC Logo** **was decided (Mar.2006)**

- **KEK Tokai-campus (since Apr.2005)**
  - **Number of people working in Tokai is increasing**
    23(Apr.05)-->60(now)->100(FY2006-end)->150(future)
    # Numbers include Acc./Phys./Office members
  - **Shuttle-bus between Tsukuba and Tokai started in Jun.2005,**
    - **80 min. / one way, 2x2 round-trips**

We enjoy working in Tokai very much, because ..

Return bus in the evening of 13.June
Leave Tokai at 6 p.m. for Tsukuba

Everyday is picnic by bus. Will you join us ?

EPICS at APS in June.2006, n.kami, KEK