Status of J-PARC Project

Shoji Nagamiya
Director of J-PARC Center at KEK/JAEA

January 10, 2007
J-PARC 50 GeV PAC

Highlights during the Past One Year

- Construction for both equipments and facilities: A slight delay, but almost on schedule.
  - Peak in the construction budget in JFY2006 (good news to us).
- J-PARC Center started.
- Significant Progress in Accelerator Development
  - Injection of the first beam to the Linac in November of 2006.
  - Technical issues like RF cavities have almost been solved.
- An external review on the operational budget.
  - A special review was made by an expert team. Then, the result was presented to the IAC meeting in March of 2006.
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- Shutdown of KEK-PS from JFY2006.
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Budget Request for JFY2007

<table>
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<tr>
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<tr>
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<td>MEXT</td>
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[JAEA]

<table>
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<tr>
<th>Category</th>
<th>Oku Yen</th>
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<td>Construction</td>
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<tr>
<td>Neutron Equipment</td>
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<td>Operational</td>
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<td>Construction (Civil Eng.)</td>
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[KEK]

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- All the requests to the Government are subject to the review of Council for Science and Technology Policy (CSTP)
  - J-PARC was ranked to “A”.

Construction Budget

![Budget Profile Chart]

- Oku Yen (Oku = 10^4)
- Budget Year: 2000 to 2008
- Phases:
  - Construction Start
  - Neutrino Completion
  - Phase 1 Completion
  - Now

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J-PARC Center: To operate the entire J-PARC by one responsible organization. [Construction team: Two institutions carry full responsibilities for funded items.]

The first Agreement was signed on August 8, 2005.

Expected numbers:
- 330 Employees
- 280 Outsourcing

J-PARC Center (Organization for Operation)
Actual Start of the J-PARC Center on February 17, 2006

Examples of Recent Actions

- J-PARC Center Expansion
  - Expansion of the J-PARC Center is planned next year.
  - Discussions are in progress at many places on how to grow the J-PARC Center.

- Beamtime Fee
  - Free when the research results are published. Fee is charged when the results are kept confidential (mostly for industrial usage).
  - J-PARC Center is making efforts along this line to convince JAEA, KEK, and the Government.

- Radiation Safety
  - J-PARC Center is responsible to it. It took, however, long time to obtain a consensus from JAEA, KEK, and the Government.

- Contract with the Third Party
  - For example, the Ibaraki-Prefecture will contract with the J-PARC Center instead of JAEA and KEK individually. The arrangement of the contract with a third party is now conducted by the J-PARC Center.

To obtain all these small agreements, an enormous amount of our time has been used.
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Accelerator Progress

- At the beginning of October, the Linac area was closed for radiation safety.
  - First beam injection through RFQ on November 20th of 2006.
  - Successful operation up to 50 MeV on December 20th of 2006 through DTL1, DTL2 and DTL3.

- RF (Finemet)
  - Problems due to electric shortage seem to be solved now.

- Ceramic Beam Pipes
  - Significant problems in 2005, but most of the problems are now solved.
Examples of New Inventions at J-PARC

- New wires strong for rapid cycle current change
- Ceramic vacuum pipe
- Magnetic alloy (Finemet)
  - High Field gradient

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Cost Analysis for Operational Budget

Operational Cost vs. Operational Hours
(Linac Energy: 200 MeV)

190 Oku Yen / year ($190M/y if $1=100Yen)

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New budget to fill this gap for neutrons and muons was funded in JFY2006 at KEK: 0.6 OkuYen for travel.
Decay Volume for Neutrinos (Beam Test in the spring of 2009)

3 GeV Synchrotron (Beam Test in the fall of 2007)

Over 70% Completed

Linac beam injection in Nov. of 2006

Muon Source (Beam Test in the spring of 2008)

Linac (Beam Test in Nov. of 2006)

Hadron Hall (Beam Test in late 2008)

50 GeV Synchrotron (Beam Test in the spring of 2008)

Hadron Experimental Hall

Materials & Life Experimental Hall

50 GeV Synchrotron

Neutrino Experimental Area

3 GeV Synchrotron

Linac

ADS Area

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50 GeV PAC

- Nuclear and Particle Physics
  - PAC meeting: June 30 - July 2, 2006. The results was sent first to the Director of IPNS at KEK and then to the J-PARC Director.
  - The J-PARC Director informed the results to individual experimental groups.
  - 20 proposals were discussed. Two proposals for slow-extracted beams and one proposal for fast-extracted beams obtained full approval.

<table>
<thead>
<tr>
<th>POS</th>
<th>Author</th>
<th>Institute</th>
<th>Proposal Title</th>
<th>Recommendation</th>
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<tr>
<td>P05</td>
<td>T.Nagae</td>
<td>KEK</td>
<td>Spectroscopic Study of $^3$-Hypernucleus, $^{12}$Be, via the $^{12}$C(K, K') Reaction</td>
<td>Stage 2</td>
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<td>P11</td>
<td>K.Nishikawa</td>
<td>KEK</td>
<td>Tokai-to-Kamioka (T2K) Long Baseline Neutrino Oscillation Experimental Proposal</td>
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<td>P13</td>
<td>T.Tamura</td>
<td>Tohoku U.</td>
<td>Gamma-ray spectroscopy of light hypernuclei</td>
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- Technical reviews were requested to the neutrino experiment.
- The next PAC meeting will be held in early January of 2007.
A big review by the Committee (appointed by the Government) started in early December of 2006.

- **Review items**
  - Linac Energy Recovery, Priority of Phase 2 projects
  - Organizational Structure at the Operational Stage (J-PARC Center)
  - Operational Budget
  - PAC, Beam-Time Fee, Commitment by the Government for Neutron Beam Lines
  - Internationalization of the J-PARC
  - Research Buildings, Lodging, etc.

- **Meeting:** Once per three weeks, from early December through May.
- **The report will be produced to meet with the budget deadline for JFY2008.**

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**Issues**

- Timely completion of the construction.
- How to grow the organizational structure at the operational stage (J-PARC Center)?
- Realistic operational budget.
- PAC (time and place), Budget for experimental facilities, Beamtime Fee, etc.
- Linac energy recovery, Phase 2 funding, etc.
  - Funding of 85 Oku Yen has to be secured for the Linac energy recovery.
- Internationalization of the J-PARC Project.
  - Research support (internationalization of the infrastructure).
  - Internationalization of the environment for lodging, life, etc.
  - Discussions with Asian countries.