

**Minutes of the First External Expert Panel Meeting to Review the Radioactive Material Leak Accident at the Hadron Experimental Facility of the J-PARC (Summary)**

1. Time and Date: 10:00-16:35 on June 21, 2013
2. Venue: Rm.116 of High Energy Accelerator Research Organization (KEK) Tokai No.1 Building
3. Attendees:
  - Members of the External Expert Panel: Mr. Naoyuki Uchimura (Journalist), Mr. Yukiya Sato (Tokai Village Office), Prof. Takashi Nakano (Osaka Univ.), Dr. Yasushige Yano (Nishina Memorial Foundation), Prof. Hiroko Nagahara (Univ. of Tokyo) \*, and Prof. Kenichi Takano (Keio Univ.)\*
    - \*: absentee
  - Members of the Working Group:
    - Prof. Makoto Inoue (Professor Emeritus at Kyoto Univ.), Dr. Noritaka Kumagai (Japan Synchrotron Radiation Research Institute), Prof. Mitsuo Tosaki (Kyoto Univ.), and Prof. Mamoru Baba (Professor Emeritus at Tohoku Univ.)
  - Members of J-PARC Center, JAEA and KEK:
    - Dr. Yujiro Ikeda (J-PARC); Dr. Naohito Saito (J-PARC), Dr. Takashi Kato (J-PARC); Mr. Kazuo Hasegawa (J-PARC), Dr. Takayuki Sumiyoshi (KEK), Dr. Hideaki Yokomizo (JAEA), and Dr. Atsuto Suzuki (KEK); Others

Agenda (1) Mandate of the External Expert Panel (hereafter EEP)

This Panel has been set up by KEK and JAEA in response to the request by the Minister of Education, Culture, Sports, Science and Technology.

This Panel will review the safety management system and procedure to follow in emergency situations of Japan Proton Accelerator Research Complex (J-PARC), and examine the suitability of countermeasures developed by the J-PARC center against recurrence of similar accidents. The Panel can set up working groups to efficiently execute its work.

Agenda (2) Election of the Chair from the Panel Members

Dr. Yano was elected to be the chair of this panel through mutual voting of the panel members.

Agenda (3) Perspectives of the review by the EEP

The review will be carried out with the following perspectives in mind: (1) the adequacy of

responses to the accident; (2) the adequacy of measures and countermeasures; (3) any issues in the organization of the management by KEK and JAEA; and (4) the adequacy of development strategies of the safety culture.

- It was confirmed that the panel would review the plans on responses, countermeasures and strategies to be presented by the J-PARC Center.
- The discussion session of today's meeting is closed to the public. However, all the material for the discussion will be publicized later on the J-PARC website.

#### Agenda (4) Establish the Working Group, Elections of Head and Deputy Head

The roles of the Working Group (WG) are to organize and compile all data/information from the J-PARC Center on the basis on the expertizes, and to deliver the material to the EEP for their discussions.

- The Panel secretariat introduced the names the following four candidates for the WG: Prof. Makoto Inoue (Professor Emeritus at Kyoto Univ.); Dr. Noritaka Kumagai (Japan Synchrotron Radiation Research Institute); Prof. Mitsuo Tosaki (Kyoto Univ.); Prof. Mamoru Baba (Professor Emeritus at Tohoku Univ.)
- The Panel approved the WG with the proposed members
- Chairperson Yano proposed Dr. Inoue as the leader of the WG and Dr. Baba as the sub-leader. The Panel members concurred.

#### Agenda (5) Overview of the J-PARC

Dr. Ikeda, the Director of the J-PARC Center, presented overview of facility, including: the organization of the accelerator complex and experimental facility, the management organization and a series of recent results. Future upgrade plans as an “intensity frontier” of the world were also presented.

#### Agenda (6) Overview of the Accident

Dr. Saito, a Deputy Director of the J-PARC Center, presented an overview of the accident, including: (1) the sequence of events and their chronology, such as a malfunction of a magnet power supply which led to a damage to the gold target and the leakage of radioactive material from the primary beamline tunnel; (2) the estimated amount of radioactive material released and their effects on the environment; (3) the circumstances which led to a delay in reporting and actions being taken now and in the future.

#### Agenda (7) Site Visit

The Panel members visited the Central Control Room of the accelerators and heard explanations on the Personnel Protection System (PPS) and Machine Protection System (MPS) screens, and displays at the accident. At a service entrance yard on the south side of the HD

experimental hall, the Panel members were briefed on the circumstances at the accident, ventilation fans and radiation shields, etc. At a power supply stage on the west side of the hall, the Panel members heard explanations on the layout of the beamlines and workers' conditions.

#### Agenda (8) Discussions

Chairperson Yano proposed to assign Dr. Nakano as his deputy. The Panel members concurred. The Chair proposed to discuss on the direction of discussions to have in the Panel and on subject matters to ask the Working Group to report about. Comments from the Panel members are as follows:

- When the shielding blocks are opened for inspection of the target, care should be taken so as not to let radioactive material out. Regardless of the target condition, work should be started from wherever possible.
- No additional leakage of radioactive material is acceptable to local residents. To restore the trust from the residents, representatives of local community associations should be provided with an opportunity to inspect the HD site.

Chairperson Yano responded as follows:

- Any countermeasures for preventing recurrence of a similar accident cannot be implemented without sufficient understanding from the local residents. Whereas the task of this panel is to review the actions and countermeasures proposed by the J-PARC Center, we should share a common understanding that approval from the local residents is a critical prerequisite for restarting the J-PARC operation.

Additional comments from panel members are listed below.

- Hardware aspects of building construction should be improved for better containment of radioactive material. Safety training is called for to prevent recurrence of use of ventilation fans in similar situations. Manuals have to be revised to ensure timely reporting.
- The lack of "stop and think" attitude in case of puzzling situations is inducing a major public concern, which has to be addressed. Recovery of the HD facility may take some time since it could require refurbishment of its hardware which may be time consuming. This, however, is an issue for the entire J-PARC.

The J-PARC Center offered a briefing on the 2<sup>nd</sup> statutory report that was submitted to the Nuclear Regulation Authority, which describes: (1) assessment of radiation controlled areas in provision against possible anomalous leak of radioactive material, (2) issues regarding the safety management system and emergency procedures, and (3) the present status and future issue of the investigation on countermeasures.

As for the radiation controlled areas, it is noted that the J-PARC facilities, except for the HD Facility, are designed adequately to prevent leak of radioactive material and do not seem problematic. For the HD Facility, the following plans were presented: (1) The primary beamline tunnel which houses the target assembly will be hermetically sealed with a double-layered barrier; (2) Ventilation of the air in the hall will be done through filters; and (3) Monitoring of radioactive material in the air within each layer of the double-layered barrier will be provided.

In response to these presentations, the chair proposed the following on the way to proceed the meetings and on the subjects to consult with the WG.

- Since the 2<sup>nd</sup> statutory report spells out our mission, the EEP shall request first the WG to verify the contents of the report. With that, and with inputs from the local community, the EEP will draft a final report in cooperating with opinions from the local community.
- The EEP will ask the WG to examine the issues found on the accelerators and beam transport systems, on targets, on the HD hall and on the safety and control systems. The EEP would like to hear the report at the next panel meeting. The EEP would like to see a report, if possible, on what happened, what could have happened, what was the likelihood of this incident, and how similar incidents took place elsewhere in the world.

This proposal was accepted and approved. Other comments from the panel members include the following:

- The report has to present an analysis on whether similar anomalous beam incidents can occur at other facilities. The report has to discuss what exactly has happened at the HD facility and how to prevent occurrence of similar rare accidents.
- Outreach activities by scientists are indispensable for developing a trusting relationship with members of the local community.
- Outreach efforts with respect to the public at large and the mass media also have to be improved.
- A scientific and logical explanation has to be consistently offered as to why the ventilation fans were kept operating for a long time.
- Efforts should be made to understand the internal logic and the value systems on the part of the members of the local community.

#### Agenda (9) Others

The next meeting will be held in the Tokyo area from 10 am on July 5 and the report from the WG will be discussed.