

第6回アジア原子力協力フォーラム（FNCA）コーディネーター会合
開催結果について（報告）

平成17年4月5日
内閣府

1．平成17年3月30日から4月1日まで、第6回アジア原子力協力フォーラム（FNCA）コーディネーター会合が東京にて開催された。

（添付資料1：プログラム、参加者リスト）

今回の会合においては、個別プロジェクト各分野における活動の報告、評価及び今後の計画について議論するとともに、昨年新たに設置された「アジアの持続的発展における原子力エネルギーの役割」パネル会合の結果報告について意見交換を行い、さらに昨年の大臣級会合で議論された「人材育成分野」等についてフォローアップを行った。主な成果は以下のとおり。（添付資料2：議事録）

2．現在実施中の8分野11プロジェクト（添付資料3）のうち、6分野8プロジェクトについてレビュー・評価が行われた。（残り2分野3プロジェクトについては次年度以降評価）概要以下のとおり。

（1）研究炉利用

病気の早期診断に有効であるラジオアイソトープ医薬品（テクネシウムジェネレーター）の製造については、新技術の有効性を示すことができ、プロジェクトの目的を果たしたので、現行のプロジェクトは2004年度で終了する。今後は、応用技術を実用化するための新しいフェーズを開始する。

健康被害をもたらす環境汚染の一つである空気中浮遊塵の分析（中性子放射化分析）については、効率的な分析手法（K0法）は確立されたが、環境行政当局との連携が不十分であったことからプロジェクトの目的を完全には達成していないことが指摘された。今後は、現行のプロジェクトを2004年度で終了し、「環境保全を目的とした大気汚染物質分析」のタイトルで新規プロジェクトを立ち上げる。

天然高分子材料（天然ゴム、多糖類など）の分子構造を解析し、新素材の開発に活用する中性子散乱技術については、特定の参加国のみでしか利用できない状態にあることが指摘された。今後は、幾つかの国で計画中的の高出力研究炉が整備されるまでプロジェクトを中断する。

（2）農業利用

干ばつや病気に強い新しい品種の開発を目指している放射線育種プロジェクトについては、乾燥に強いソルガム（中国のコウリャン）の品種開発に成果が出始めている

ことが確認された。今後は、新しい変異体種の登録の達成と普及戦略の定着化を達成するため、本プロジェクトを2年間継続する。また、マレーシアは耐病性の強いバナナ、タイは耐虫性の強い蘭のサブプロジェクトの指導国を引き受ける。

(3) 医学利用

子宮頸がん等の放射線治療効果を高めることを目指している放射線治療プロジェクトについては、子宮頸がんの治療マニュアルが完成し、腫瘍への線量計測管理は品質保証・管理面において適切であることが確認された。今後は、子宮頸がんにおける抗がん剤と放射線の併用法の臨床試験を2006年まで継続するが、新たに上咽頭がんの臨床試験を開始し、5年間継続する。

(4) 原子力広報

原子力広報プロジェクトについては、講師派遣、公開講座、原子力広報担当者の訓練、アンケート調査等を実施したが、FNCA諸国の広報を共通のプログラムで実施することは効果的でないことが指摘された。今後は、メディアや政治家等の原子力施設の訪問、FNCAの活動を国民やメディアへ紹介、原子力エネルギー利用と放射線利用のそれぞれにおける広報戦略について検討する。(本プロジェクトは継続)

(5) 人材育成

原子力人材育成プロジェクトについては、教材の整備、人材育成の施設・設備の調査が実施されてきたが、必ずしも十分な成果があがっていない。人材育成戦略は各国で推進されるべきであり、FNCAはその活動を支援するものであることが指摘された。今後は、ベトナム提案のアジア原子力大学構想についてその内容を具体的に検討する。(本プロジェクトは継続)

(6) 放射性廃棄物管理

放射性廃棄物管理プロジェクトについては、医療用放射線源の管理と保管や、鉱山など産業活動で濃縮される天然資源由来の放射性物質の調査を行い、FNCA各国の状況をまとめて報告書を発行した。しかし、各国の資金不足もあり、管理や測定を向上させるような実効的な成果はあがっていない。今後は、ピアレビュー(現地調査)や情報交換により、使用済線源や放射性廃棄物の安全管理の質を高める活動を推進する。また、IAEAのガイドラインを活用し、廃棄物管理に関する演習を実施する。(本プロジェクトは継続)

3. FNCAにおける2つの新規活動の進捗状況が報告された。

(1) 「アジアの持続的発展に果たす原子力エネルギーの役割」のパネル

日本コーディネーターより、2004年10月20、21日に東京で開催された第1回パネル会合の結果が報告され、FNCA地域におけるエネルギー需要は将来、急速に増大する一方、同地域の一人当たりの化石燃料埋蔵量は最低レベルであることが

明確に示されたことが強調された。また、各国及び東アジア地域としての長期的なエネルギー供給戦略の策定が重要であることに合意した。

(2) 「陽電子放出断層撮影診断(PET)」プロジェクト

マレーシアの主導で2005年度より開始される「陽電子放出断層撮影診断(PET)」のプロジェクトの進め方について検討を行った。この診断法は、早期がんの発見、病期判定、治療効果の評価、再発や予後の識別といった様々ながんの診断に有効であることを確認した。

4. 昨年的大臣級会合のフォローアップとして、「人材育成」及び「FNCAの将来」について、討議が行われた。

(1) 人材育成協力

冒頭、ベトナムより「アジア原子力大学」設立のための可能な体制と活動計画についての提案が行われた。その後、討議の結果、主に以下の点につき一定の合意を得た。

- a) 原子力人材育成は持続可能な発展に不可欠で継続的に行うべき
- b) 各国はそれぞれの国策に応じた独自の原子力人材育成計画を策定すべき
- c) 専門家ミッションがニーズを調査し、実施のための可能なメカニズムを提案すべき
- d) 専門家ミッション報告を人材養成プロジェクトのワークショップに提出すべき
- e) 人材養成プロジェクトのワークショップは上級行政官会合(SOM)に報告する活動計画を準備すべき
- f) 十分な検討を踏まえ、SOMは大臣級会合に決定を求める勧告を行うべき

(2) FNCAの将来

FNCAの将来政策や計画のあり方について発表・討議を行い、主に以下の点で合意した。

- a) FNCAの将来活動は参加国のニーズや関心と合致して作られるべきで、エンドユーザーとの密接な連携を保つ必要がある。
- b) 共通の関心事のうち選ばれた政策事項は、大臣級会合でとりあげられるべき。
- c) 参加国は、プロジェクト活動の主宰や施設の共用など、FNCAプロジェクトに更に貢献すべき。
- d) FNCA活動とRCAなど他の地域活動と更なる相乗効果を見出すべき。
- e) プロジェクトリーダーと密接なコミュニケーションやエンドユーザーとの連携などコーディネーターの役割は重要。

第 6 回 FNCA コーディネーター会合プログラム

	3月30日(水)		3月31日(木)		4月1日(金)
9:00-9:20	セ1「開会」 議長：フィリピン 挨拶（町 日本コーディネーター(CD)） 参加者自己紹介 / 議事日程採択 / 議長・議事録選任 <記念撮影+ブレーク>	8:30-17:40 8:30-10:30	セ6「プロジェクトの活動報告、評価、計画」 (1) 研究炉 議長：オーストラリア ・全体+基盤技術（横溝 10分+Q&A 5分） ・Tc-99m（源河 15分+評価/Q&A 25分） ・中性子放射化分析 （海老原 15分+評価/Q&A 25分） ・中性子散乱（森井 10分+評価/Q&A 15分） <ブレーク>	10:00-11:30	議長：ベトナム 総括セッション ・議事録討議 ・議事録起草
9:20-9:40				11:30-11:40	<ブレーク>
9:40-10:00	セ2「第5回大臣級会合報告」 （タン・ベトナム CD）		(2) 農業 議長：タイ ・放射線育種（中川 10分+評価/Q&A 30分） ・バイオ肥料*（横山 10分+タイ・オムサブ 15分+Q&A 10分）	11:40-12:00	閉会セッション ・議事録採択 ・閉会挨拶 （町 CD）
10:00-12:00	セ3「新規活動の進捗状況」 ・「パネル」報告と計画 （町・日本 CD 20分） ・「医療用サイクロトロン PET」計画 （マレーシア・アトキ 20分+日本・遠藤 10分） ・新規提案（10分）	10:30-10:50 10:50-12:05			
11:50-13:00	ランチ	12:05-13:00	ランチ	12:00-13:10	ランチ
13:00-15:30	セ4「人材養成」 議長：インドネシア ・ANU ベトナム提案（タン CD 15分） ・今後の進め方（町 CD 15分） - 上級行政官レベル会合開催 - 第6回大臣級会合への報告 ・ANUに関する各国コメント（120分） <ブレーク>	13:00-13:50 13:50-14:10 14:10-15:00	議長：韓国 (3) 医学：放射線治療 ・辻井 10分+評価/Q&A 40分 (4) 原子力安全文化* ・オーストラリア・イージー-5分+石川 5分+Q&A 10分 (5) 原子力広報 ・田中 10分+評価/Q&A 40分 <ブレーク> 議長：中国 (6) 人材養成 ・松鶴 10分+評価/Q&A 40分 (7) 工業：電子加速器* ・久米 10分+中国マオ 15分+Q&A 20分 (8) 放射性廃棄物管理 ・小佐古 10分+評価/Q&A 40分		
15:30-15:45					
15:45-17:15	セ5「FNCAの将来」 議長：マレーシア （町 CD） ・プロジェクトのホスト国の拡大 ・政策討議の重要性 他	15:00-15:15 15:15-16:05 16:05-16:50			
18:00-19:30	歓迎レセプション	16:50-17:40			

*セ6において、農業（バイオ肥料）、原子力安全文化、工業（電子加速器）は今回評価対象外

第6回FNCAコーディネーター会合 主な出席者

- 町 末男 原子力委員会委員
(FNCA 日本コーディネーター)
- 横溝 英明 日本原子力研究所 東海研究所 副所長
(FNCA 研究炉利用主査)
- 海老原 充 東京都立大学大学院 理学研究科 教授
(FNCA 研究炉利用・放射化分析プロジェクトリーダー)
- 森井 幸生 日本原子力研究所 東海研究所 中性子利用研究センター次長
(FNCA 研究炉利用・中性子散乱プロジェクトリーダー)
- 源河 次雄 (社)日本原子力産業会議 アジア協力センター 調査役
(FNCA Tc-99mジェネレーター製造プロジェクトリーダー)
- 中川 仁 (独)農業生物資源研究所 放射線育種場 場長
(FNCA 放射線育種プロジェクトリーダー代行*)
- 横山 正 東京農工大学 共生科学技術研究部 助教授
(FNCA バイオ肥料プロジェクトリーダー)
- 辻井 博彦 (独)放射線医学総合研究所 重粒子医科学センター長
(FNCA 放射線治療プロジェクトリーダー)
- 田中 靖政 学習院大学 名誉教授
(FNCA 原子力広報プロジェクトリーダー)
- 小佐古敏荘 東京大学 原子力研究総合センター 助教授
(FNCA 放射性廃棄物管理プロジェクトリーダー)
- 石川 迪夫 元北海道大学教授
(FNCA 原子力安全文化プロジェクトリーダー)
- 松鶴 秀夫 日本原子力研究所 国際原子力総合技術センター長
(FNCA 人材養成プロジェクトリーダー)
- 久米 民和 日本原子力研究所 東海研究所 イオンビーム生物応用研究部長
(FNCA 工業利用電子加速器プロジェクトリーダー)

〔オーストラリア〕

ジョン・イージーオーストラリア原子力科学技術機構上級研究
科学官

〔中国〕

チャン・ジー

フォワン・ウェイ

マオ・ベンジャン

中国国家原子能機構国際合作司 司長
中国国家原子能機構国際合作司 次長
中国工程物理研究院環境防護工学研究所副主
任工程師

〔インドネシア〕

スジャルトモ・ストノ

フディ・ハストヲ

シヒテ・タムリン

インドネシア原子力庁長官
インドネシア原子力庁次官
エネルギー鉱業資源省企画・海外協力局長

〔韓国〕

チェ・ジョン・バエ

イ・ユン・ジン

キム・キョン・ピョ

ソ・ミン・ウォン

科学技術部原子力局原子力国際協力課長
韓国原子力研究所原子力訓練センター課長
韓国原子力研究所 国際協力室主席研究員
韓国原子力国際協力基金多国間協力部長

〔マレーシア〕

ダウド・モハマド

アドナン・ハジ・カリッドマレーシア原子力庁長官
マレーシア原子力庁企画対外関係部長

〔フィリピン〕

アルマンダ・デラ・ロサ

コラゾン・ベルニド

フランシスコ・ベニート

フィリピン原子力研究所所長
フィリピン原子力研究所副所長
フィリピンエネルギー省次官

〔タイ〕

ジンダロム・チャワジャルンパン

オムサブ・ノパモルンボディ

スチャット・ブクバニャン

タイ原子力庁原子力エネルギー管理局国際協
力グループ長
農業協同組合省農務局上級研究所バイオ肥料
顧問研究員
タイ発電公社機械技術課長

〔ベトナム〕

ヴォン・フー・タン

ル・ドアン・ファク

タ・ヴァン・フォン

ベトナム原子力委員会委員長
ベトナム原子力委員会国際協力部長
工業省エネルギー・石油局長コーディネーターに下線(タイ、オースト
ラリアは代理出席者)

Record of the Sixth FNCA Coordinators Meeting
March 30- April 1, 2005, Tokyo, Japan

April 1, 2005

1. Session 1

The Sixth FNCA Coordinators Meeting (CM) was held from March 30 through April 1, 2005 in Tokyo, Japan, hosted by the Atomic Energy Commission (AEC) of Japan and Cabinet Office (CAO) of Japan.

Dr. Sueo Machi, the Commissioner of Atomic Energy Commission of Japan (and FNCA Coordinator of Japan) gave the welcome remarks at the Opening Session.

The Meeting was attended by delegates from FNCA countries, i.e., Australia, the People's Republic of China, Indonesia, Japan, the Republic of Korea, Malaysia, the Philippines, Thailand and Viet Nam.

2. Session 2

In Session 2, Professor Vuong Huu Tan, Chairman of Viet Nam Atomic Energy Commission and the FNCA Coordinator of Viet Nam gave a summary report of the Fifth FNCA Meeting in Hanoi, Viet Nam (Ministerial Level Meeting and Senior Officials Meeting). The Sixth FNCA Coordinators Meeting took note of the report.

3. Session 3: Progress of New Activities

In Session 3, progress of two new activities was reported namely: the Panel on "Role of Nuclear Energy for Sustainable Development in Asia" and the project on "Cyclotron and PET (Positron emission tomography) in Medicine".

Dr. Machi reported the results of the 1st Meeting held on October 20- 21, 2004 in Tokyo. The Panel was composed of nuclear experts and energy experts. He emphasized that the Panel clearly noted that energy demand would rapidly increase in the future but per capita reserves of fossil fuel were at the lowest level for the region encompassing the FNCA countries.

The 6th Meeting agreed that the formulation of a long term energy supply strategy was important.

China stated that their nuclear power capacity was predicted to expanded to 36-40GW by 2020, with power capacity doubling to 900GW.

Korea stated that 19 nuclear power units were in operation and 8 units would be added before 2015 to meet increasing demand.

Malaysia, the Philippines and Thailand stated that there were no definite plans for them to use nuclear power in the near future and nuclear power was the last option. These countries had other indigenous energy resources such as fossil fuel, hydro power, and geothermal energy.

Indonesia stated that the recent price increase of oil might trigger the recognition of benefit of nuclear power, and that his government had a plan to construct the 1st NPP in the second decade of this century. Amongst other reasons it would save the oil reserve.

Viet Nam stated that his government had completed pre-FS on the 1st NPP and was hoping to start operation before 2018 in order to meet the rapidly increasing power demand.

Australia stated that media in his country were recently discussing the benefits of nuclear power in terms of CO₂ emission reduction after the Kyoto Protocol entered into force in Feb., 2005 and after the potential sale of the Olympic Dam mine, which had the world's largest known reserve of uranium.

China and Indonesia stressed that the CDM of Kyoto Protocol should include nuclear power because it could provide energy without emission of GHG. They also proposed that the FNCA could be a forum to appeal COP to include nuclear power in CDM. Viet Nam, Korea and Japan supported the suggestion.

The FNCA Coordinator of Japan stated that 4 years ago the same issue had been discussed at the FNCA Ministerial Level Meeting but without reaching a consensus view. However, circumstance had now changed in terms of the rapid increase in energy demand and the entering into the force of the Kyoto Protocol. Therefore the time was matured to discuss this question again and hopefully reach consensus. The Panel on "Role of Nuclear Energy for Sustainable Development in Asia" provided an excellent forum to exchange views on this point and to report the Panel's conclusion to the Ministerial Level Meeting for appropriate action to appeal for the inclusion of nuclear power in the CDM.

Mr. Adnan Haji, Khalid of Malaysia made a presentation on the new "Cyclotron and PET in Medicine" project. He reported on the revised title of the project, the objectives, component of the project and new plan as modified with the cooperation of the Japanese expert mission to Malaysia. The project would start in FY2005 with a national workshop. Dr. Endo, Project Leader of Japan explained the project from a technological viewpoint.

CT, using X-ray, showed an image of the anatomy. While PET showed an image of

the physiology and metabolism. PET, using of ^{18}F -FDG, was useful for several cases of cancer diagnosis such as the detection of early cancer, the staging of the disease, the evaluation the response to therapy and the knowing the recurrence and prognosis.

The current status of the applications of cyclotron and PET in medicine in Viet Nam, Thailand, the Philippines and Malaysia was presented. Viet Nam had already installed a PET camera and cyclotron in private hospital, and had another plan to install units in Hanoi and Ho-Chi Minh City respectively next year.

Thailand had an on-going national project on PET in cooperation with the IAEA. The Government had a plan for a PET and cyclotron center to be established in Bangkok.

The Philippines had been operating a medical cyclotron and PET for the past three years, and would be willing to share their experiences in licensing and regulation of the cyclotron, and in the diagnosis and treatment of cancer and other pertinent diseases.

Malaysia had installed its first PET-CT in Penang recently and would have its first cyclotron facilities by the end of 2005. In addition a National Cancer Institute would be established very soon in Putrajaya.

4. Session 4: Human Resources Development

In Session 4, Human Resources Development was dealt with to follow up the discussion on HRD at the Fifth FNCA Ministerial Level Meeting in Hanoi, Viet Nam on 1 December 2004. During the Ministerial Level Meeting it was agreed that the proposal of Viet Nam on the Asian Nuclear University (ANU) should be carefully studied by the Senior Level Meeting.

In response to this Ministerial action, Prof. Tan presented a possible scheme and an action plan for the establishment of the ANU. He cited difficulties in assuring the quality of nuclear HRD in FNCA countries due to inadequate teaching materials, obsolete curricula, a lack of qualified teachers and a lack of laboratory infrastructures. The proposal was to build a network of nuclear universities in Asia within the FNCA framework. Prof. Tan proposed the following action plan: organization of the first meeting for the FNCA nuclear university, set up a peer review mission, exchange curricula and teaching materials, mobilize all possible financial support for nuclear HRD activities.

The Meeting agreed that a) nuclear HRD is essential for sustainable development, b) each country should come up with its own nuclear HRD plan according to its own national agenda, c) an expert mission should be organized to examine the needs and to propose a possible mechanism of implementation, d) to submit the expert mission report to the HRD project workshop, e) the HRD project workshop

should prepare the specific action plan to be presented to the Senior Officials Meeting (SOM), f) after careful review, the SOM to make recommendation to the Ministerial Level Meeting for decision.

Dr. Soedyartomo Soentono of Indonesia suggested that the project should start as small activity in a specific area such as standardization of curricula particularly on nuclear safety and radiation, in accordance with international standards.

5. Session 5: Future Cooperation under the FNCA

Dr. Machi, as the lead-off speaker, made presentation on this policy and program of FNCA in the future. Among other things, he stressed on the following points:

- 1) Future activities of FNCA should be designed to meet the needs and interest of the member countries and needed to have close linkage with; the end-users
- 2) Selected policy issues of common areas of interest should be taken up for discussion at the Ministerial Level Meeting;
- 3) Member countries should contribute more to the FNCA projects, such as hosting project activities and sharing facilities;
- 4) Better synergy between FNCA activities and other regional activities such as RCA and IAEA should be sought;
- 5) The important role of coordinators in having closer communication with project leaders and also linkages with end-users.

The Meeting agreed with the above points and stressed that the selection of the project should be in accordance with the priority area of the country and in implementing the national agenda so that the project will benefit end-users and the public at large. All the participating countries have offered to share their facilities for the FNCA projects, in which they are participating.

6. Session 6: Progress, Evaluation and Planning of FNCA Projects

8 out of 11 on-going FNCA projects which had been implemented for the past 5 years were reviewed and evaluated.

6.1 Utilization of Research Reactors

<Tc-99m Production>

Dr. Tsuguo Genka, Project Leader of Japan gave an overview on the progress and achievements of the project. He reported that:

- 1) the technology of PZC-based Tc-99m generator had been successfully established,
- 2) the clinical trial of radiopharmaceutical kits labeled with Tc-99m from PZC-based

Tc-99m generator were comparable with fission type generator, and
3) the cost estimation for PZC type Tc-99m generator was much lower than the fission type generator.

The Meeting was briefed on the situation with regards to Japanese and Indonesian patents related to the PZC based Tc-99m generator and associated systems. The Meeting agreed that the project has achieved its objectives to demonstrate usefulness of new technology to produce Tc-99m generator by (n, gamma) reaction. Therefore the current project should be terminated in the current year.

For future plan, the Meeting agreed to embark on new phase to commercialize the application of the technology. However, as not all FNCA countries had the capacity to produce Mo-99 on their own, it was essential for FNCA to establish a reliable network of supplier countries to ensure continuous supply of Mo-99. The Meeting agreed to start the new phase in FY2005 and for it to be completed within two years.

<Neutron Activation Analysis (NAA)>

Dr. Mitsuru Ebihara, Project Leader of Japan made a presentation of the progress and achievements of the project. He reported that the NAA Ko-method technique had been successfully applied to the analysis of suspended air particulate matter (SPM) for monitoring the environmental air pollution levels in FNCA countries.

The Meeting however took note that the objectives of the project had not been fully achieved due to insufficient linkage with the environmental agencies to use the NAA data. For the future plan, the Meeting agreed that the current project would be terminated in FY2004 and a new project on "Monitoring Environmental Pollution by NAA for Environmental Protection Strategy" initiated. In this regard, all countries were requested to establish strong linkages with their environmental agencies to ensure that the project would be carried out based on the actual need of the authority.

< Neutron Scattering (NS)>

Dr. Yukio Morii, Project Leader of Japan made a presentation on the progress and achievements of the project. He reported that the SANS technique had been successfully carried out for structural analysis of natural polymer such as k-carrageenan and NR- TPE for medical, biological and industrial applications.

The Meeting took note that advanced SANS facilities were currently available only in certain member countries such as Australia, China, Indonesia, Japan, and Korea. For the future plan, the Meeting agreed to suspend the project until some of the

new high flux research reactors such as in Australia, China and Thailand became available. In the meantime, existing mechanisms such as MEXT scientist exchange program could be used to support SANS activity. In addition, communication and contact should continue among the relevant scientists involved in SANS project. The Meeting also agreed that efforts should be made to understand the actual needs of industry that might be addressed by SANS technology and also to clearly explain to industry what SANS could offer to help and solve their problems.

Proposal on “Enhancement of Research Reactor Technology for Effective Utilization” was accepted.

6.2 Agricultural Application

<Mutation Breeding (MB)>

Dr. Hitoshi Nakagawa, Acting Project Leader made a presentation on the progress and achievements of the project.

The drought tolerant sorghum mutant lines had been successfully developed, one of which had been registered in China. The sorghum project would be extended for another two years to achieve the registration of additional new mutant varieties and to formulate extension strategies.

Malaysia and Thailand accepted the roles of leading countries for the Banana Sub-project and the Orchid Sub-project, respectively. These two sub-projects need 2-4 more years to achieve their objectives.

Since mutation breeding took several years before mutant varieties were developed, Dr. Machi suggested that milestones should be set up for important steps at various phases of the project.

Korea announced its intention to join the project again and to share the related facilities. The Meeting welcomed the offer of Korea. The mutation breeding manual, edited by the Philippines and Japan was completed and published in FNCA website (<http://www.fnca.jp/mb/mbm/mbm.html>).

<Biofertilizer (BF)>

Dr. Tadashi Yokoyama, Project Leader of Japan presented the progress and achievements of the project which commissioned in 2002 as follow.

a) selection of effective microorganisms, b) improvement of inoculant, c) improvement of soil microbial activities. Most countries had conducted field trails/ demonstrations which confirmed the effectiveness of BF for many types of plants. The effectiveness of 15-55 kGy irradiation for carrier sterilization was demonstrated by China, Indonesia, Malaysia, Thailand and Viet Nam. A fertilizer cost benefit analysis conducted by the Philippines, Thailand and Viet Nam indicated increased economic returns to the farmer with the application of BF.

Dr. Omsub Nopamornbodi, BF expert from Thailand presented a paper on the status and future of BF application in Thailand.

6.3 Application of Radioisotopes and Radiation for Medical Care

< Radiation Oncology (RO)>

Dr. Tsujii, Project Leader of Japan made a presentation on the progress and achievements of the project. He reported that standardized protocol of radiation therapy in uterine cervical cancer (CERVIX-I) had been established and published in 2003 for dissemination and training. The protocol for accelerated hyper-fractionated radiotherapy (CERVIX-II) had been clinically tested and had an overall survival rate of 77% which was higher than that of CERVIX-I. QA/QC dosimetry audits of brachytherapy have been undertaken in the Philippines, Thailand, Viet Nam, Korea and Japan by a group of experts from FNCA countries in 2003 and 2004. The audit results indicated that QA/QC of these countries were within the acceptable range.

It was agreed that the project should be continued until 2006 for testing a new clinical protocol using chemo-radiotherapy (CERVIX-III). A new activity would be the design and clinical testing of a protocol in head and neck cancer which was also common in FNCA countries. The QA/QC audit brachytherapy would be conducted in Malaysia, China and Indonesia.

6.4 Nuclear Safety Culture (NSC)

Dr. John Easey of Australia made a presentation on the progress and achievements of the project. He reported on the peer review of research reactors safety culture carried out in Viet Nam and Korea and on the improvements to be made to enhance safety culture.

He also reported on the bilateral meeting between Australia and Japan in March 2005 to enhance Safety Culture. The Meeting took note of the need for the establishment of a strong independent regulatory body is a necessary first step towards a strong safety culture and the recommendation for this to be considered as a topic for the next Ministerial Level Meeting. Dr Machi noted that nuclear safety had been the theme for the 1st Ministerial Level Meeting and that after 5 years it might be time to raise this again .

For future activities, the Meeting took note that Indonesia had agreed to host the Nuclear Safety Culture workshop in 2005 in Yogyakarta.

The Meeting also agreed that the project on Safety Culture should be continued as there should be no compromise on safety issue. The Meeting took note of the recent initiative by Australia on regional safety and security of radiation

sources. It agreed that the aspect of security should be dealt separately from the nuclear safety project.

6.5 Public Information of Nuclear Energy (PI)

Dr. Y. Tanaka, Project Leader of Japan presented the progress and achievements of the project. The Meeting agreed 1) the enhancement of communication with media, and training nuclear communicators were important activities of the PI project, 2) RSB should be continued to be better utilized by FNCA countries for their PI activities.

Japan suggested that achievement of FNCA activities and its social impacts should be relayed to the public and to the media in each country.

Dr. Machi stressed that media, public, and opinion leaders should be invited to nuclear research institutes and nuclear power plants so they could better appreciate and understand safety assurance as well as the benefits of nuclear applications.

A proposed joint survey on “the role of nuclear energy in terms of environmental impact and energy security” would be examined at the forthcoming PI Project Leaders Meeting to be held in Japan in the Fall of 2005. With these comments, the Meeting agreed that the project should be continued following the proposed future plan.

6.6 Human Resources Development (HRD)

Mr. Matsuzuru, Project Leader of Japan reported the progress and achievements of the project. The Meeting noted that the HRD strategy should be formulated in accordance with nuclear program of each country, and FNCA would support appropriately.

It was agreed that the national nuclear HRD plan should be demand-driven and possible contributions from each country to the project should be defined and be integrated in overall FNCA HRD plan.

Dr. Machi reiterated that the next HRD workshop should be devoted to preparation of specific mechanism and action plan for the proposed Asian Nuclear University (ANU) to be reviewed by the next SOM in Nov. or Dec. 2005. With these comments, the Meeting agreed to continue the project in view of the importance of HRD.

6.7 Industrial Application, Electron Accelerator (EB)

Dr. Kume, Project Leader of Japan, made a presentation on the progress and achievements of the project and proposed the plan in 2005. He reported on the

application of low energy EB accelerator for liquids, solids and gases, and potential application of this technology.

Dr. Mao of ENTECH, China presented a paper on “Industrial Application of EB for Flue Gas Cleaning in China”. He shared the information on the construction cost of the flue gas cleaning facility for 300MW coal burning power plant was about USD 200 million in China.

The Meeting agreed that this project should make technical and economic assessment of EB applications for specific processing such as: natural polymers, waste water treatment and flue gas in the workshop in 2005.

6.8 Radioactive Waste Management (RWM)

Dr. Kosako, Project Leader of Japan, made a presentation on the progress and achievements of the project. The Meeting noted the good achievements of TENORM Task Group in 2003 and 2004 and spent radiation sources.

The Philippines expressed a wish to host a meeting to discuss waste management safety and security as proposed at the Ministerial Level Meeting in Viet Nam in 2004.

The Meeting agreed to organize the Project Workshop in the Philippines including a major agenda item of safety and security of the waste management. The Philippines requested the assistance of any country that could provide additional resources to this workshop so that the maximum benefits could be derived for an area that currently had a high profile.

With these comments, the Meeting agreed the project should be continued following the proposed future plan.

7. Wrap-up Session

In the Wrap-up Session, the drafted minutes of the 6th CM was discussed by the delegates.

8. Closing Session

In the Closing Session, the Minutes of the 6th CM was adopted by the delegates. Dr. Machi gave the closing remarks, and officially closed the Sixth FNCA Coordinators Meeting.

END

個別プロジェクト(8分野)活動の概要:

現在、FNCAの枠組みの下、以下の8分野の協力活動が行われている。このうち、安全文化はオーストラリアが主導し、他の分野は日本が主導している。

第6回コーディネーター会合で評価の対象となったのは**6分野8プロジェクト(太字・下線部分)**

分野 / プロジェクト		目 的
研究炉 利 用	<u>テクネチウム・ジェネレーター</u>	FNCA 参加国が輸入に頼っている核医学診断用のテクネチウム (Tc-99m) の簡便な製造方法の開発。
	<u>中性子放射化分析</u>	大気汚染防止を目的とした中性子放射化分析による大気浮遊塵分析のための標準手法の開発。
	<u>中性子散乱</u>	小角中性子散乱 (SANS) 技術を用いた天然および合成高分子材料の評価技術の確立。
農 業 利 用	<u>放射線育種</u>	乾燥に強い大豆やソルガム、耐虫性のラン、耐病性のバナナの品種開発研究およびデータベースや突然変異育種マニュアルの作成。
	バイオ肥料	空気中の窒素を固定する根粒菌やリン等、植物の養分吸収を助ける菌根菌などの微生物資材を利用したバイオ肥料の開発。
医 学 利 用	<u>放射線治療</u>	アジアに多い子宮頸がん等を対象とした放射線治療の標準治療手順の共同臨床研究を実施。新たに、抗がん剤との併用による研究を開始。
工 業 利 用	低エネルギー電子加速器利用	FNCA 参加国への低エネルギー電子加速器の工業利用 (材料開発や環境浄化) の普及活動。
<u>原子力広報</u>		FNCA 参加国の広報活動への支援。原子力広報を目的に各国に専門家を派遣するスピーカーズ・ビューローや各国高校生を対象とした放射線利用に関するアンケート調査等を実施。
<u>放射性廃棄物管理</u>		FNCA 参加国の放射性廃棄物管理の現状、法規制体系、組織などに関する情報交換およびテノルム (TENORM、自然起源の放射性物質) の安全管理に関する情報交換、現状把握についての調査のとりまとめ。
原子力安全文化		安全文化指標などの国別調査を通じた各国の原子力安全文化促進活動、および研究炉のピアレビュー (相互評価) 活動の実施。
<u>人材養成</u>		FNCA 参加国での原子力人材養成のニーズ調査を踏まえた人材養成戦略の検討等。