Research and Study of National Satellite Application In Mongol

Final Report

April 15, 2014

INFORMATION TECHNOLOGY, POST AND TELECOMMUNICATION AUTHORITY
MONGOLIA

KDDI foundation
JAPAN

INFORMATION TECHNOLOGY, POST AND TELECOMMUNICATION AUTHORITY, MONGOLIA

KDDI Foundation

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1. Executive Summary

On behalf of the APT J2 project in Mongolia regarding research and study of National Satellite in Mongolia, we would express sincere application on the selection and financial support by APT, in accomplishing this project.

As the Government of Mongolia has decided to launch National Communication and Remote Sensing satellites, In order to launch both satellites smoothly and effectively, Mongolian government needed to make lot of policy, regulation, decisions, measures as well as understanding related any technologies. Therefore, Mongolian government should conduct researches and studies to be conducted in cooperation with Regional and International organizations, satellite developers and research institutions, at this proposal.

We completed the following research and study activities under the APT J2 programme;

- Exchange experts between Japanese and Mongolian research institutions to get relevant information.
- Policy consultancy
- Satellite operation after launching
- Human resource development in these areas
- Remote Sensing and Communication Satellite application study in Mongolia

Following section are the report of our accomplishing activities and results at the completion of this APT J2 project, herein.

2. Introduction

1-1. **NAME OF THIS PROJECT**

Study on National Satellite Applications of Mongolia

APT ref.: APT/J2J3/Result/App: 27 March 2012

1-2. **OBJECTIVES**

The objective of the project is to identify and analyze all aspects like cost, benefit and risk of the satellite launching and operation, policy and application in Mongolia. Study on how to build up appropriate infrastructure and application for satellite system in Mongolia.

1-3. **CURRENT STATUS**

The Geo-Stationary Satellite orbit positions at longitude 74.0E and 113,6E degree were allocated by International Telecommunications Union (ITU) for Mongolia. This opens the possibility to launch Mongolian communication satellite. During studying communication satellite we have seen that Mongolia could launch even small Earth observation satellite for specific purposes.

1-4. **PURPOSE OF THIS PROJECT**

We, in Mongolia, are choosing that we will solve many ICT and Remote Sensing issues by launching satellite. Human resource for space technology in Mongolia is one of the key objectives so we need to educate high skilled professionals in developed countries such as Japan. So we are collaborating with Japanese satellite expert.

The main purpose of this project is to develop Human resource in Space field in Mongolia and to exchange personnel/expert between Japan and Mongolia. The most importance is to transfer knowledge and information from Japanese satellite experts.

1-5. **PARTNERS IN THIS PROJECT**

MONGOLIA:

Information Technology, Post and Telecommunication Authority (ITPTA)

JAPAN:

KDDI foundation
Kyushu Institute of Technology (KIT)
National Institute of Information and Communications Technology (NICT)
Japan Aerospace Exploration Agency (JAXA)

Applicant & Chief researcher:

Chairman, ITPTA	Mr. Jadamabaa Tsagaan-Uvgun
Director, ITPTA	Dr. Otgonchimeg Buyanjargal
Account Manager: KDDI-Foundation	Mr. Yosuke Uchiyama

1-6. **MILESTONE (SIGNIFICANT PHASES) IN PROPOSAL**

In considering meeting and research schedule, at start point, Japan team studied the situation and status of Mongolian satellite literacy and requirements, and then discussed and agreed how we would successfully, satisfactory and adequately execute this HRD project in detail.

We considered at least two research trips from Mongolia for exchange after and based on agreement of 1st kickoff meeting. Following is milestone refer to planned budget and refer to due date of final report.

1. Kickoff discussion and agreement of the project detail
2. Tokyo Study and Research tour with discussion
3. Study, discussion and Research of Mongolian plan
4. Procurement and export/import refer to result of the kick-off discussion
5. Analyzing and reporting
6. Report (Activity and Accounting / Interim and Final) to APT from Mongolia

1-7. **EXPECTED OUTPUT AND CONTRIBUTION**

Blows are the expected output at the beginning of this project;

Highlight specifically what has already been done and what is lacking in Mongolia in area of satellite application and its operation. This task's goal is to complete the response to the question;

What is the general situation regarding current policy on satellite launching in Mongolia?

What are the main historical factors that should impact on Launching satellite systems?

What is the reason for having satellite system for Mongolia in all aspects?

What is the most appropriate satellite system for benefits of Mongolia?

To achieve these objectives, study of previous researches and case analysis were

conducted.

Overall cost and benefit analysis: Detailed analysis of expected usage and confirm system capacity requirements. This task's goal is to entirely complete the response to the question;

What should be identified cost estimation for system, policy, security and etc.?

How much costs for system development (developing a detailed system design in terms of technical and operational characteristics), infrastructure and running cost?

What will be the benefit to the society, economy and security?

Cost analysis result is unavoidable for initiating actions leading to financing the system, including detailed financial analyses.

The final report will be developed on a management structure and timing for system implementation to commence initial planning of satellite launching for the Government of Mongolia. The work result to be done would be advantageous if its work could commence on the basis of an interim approval by government to proceed with any final approval to depend on the results of the detailed studies undertaken during the work. Based on the previous steps of the research, optimal solution of the launching satellite system of Mongolia will be proposed.
Outcomes of the stages/phases of the research will be presented to the APT and the Government of Mongolia.

The outcome of this project in this new area for researching any resource by using satellite capability in developing countries such level of Mongolia,

The results of Our Joint research project contribute to two main issues.

Encourage development of content and applications

Develop human resources capacity

Above contribution belong not only to specific satellite communication but also more wide area including policy/strategy/vision of nationwide, satellite operation and application, and relevant service and matters.

Our research and study will contribute to citizen in Mongol, especially following 4 points.

> *Encourage our governments and other public services to enhance their integration with the ICT broadband system in providing easy to use, transparent, and quality services to our citizens*
>
> *Provide incentives to businesses, particularly SMEs(Small and Medium Enterprises) and individuals, to develop applications and to provide appropriate mechanisms for sharing revenue for the use of their application and content*
>
> *Encourage regional use of content and applications for widening the scope and extent of the regional market and to take the best advantages of regional needs and strengths*
>
> *Encourage content and application sharing among member countries in a non-commercial scheme for non-commercial use.*

Also, following human resource development because such technology is considered for only strong and high advantage countries program, now more counties reach the level of practical research.

Two issues may apply during this project in Mongol, and then other countries.

> *Encourage our experts and ICT professionals to be available for regional needs and coordinate through APT to establish a 'pool' of accredited ICT professionals for the service of the Asia-Pacific region*
>
> *Support collaborative research and development works in the field of ICT and its applications, and that are conducted jointly within the region, for sharing information and for transferring knowledge to build research and*

development capability of personnel in the region.

1-8. **ITEMS AND ACTIVITIES BY RESEARCH AND STUDY AT THE PROPOSAL**

Research issues are related below policy and technology as well as history and status in Japan.

-What is the general situation regarding current policy on satellite launching?
-What are the main historical factors that should impact on Launching satellite systems?
-What is the reason for having satellite system?
-What should be identified cost estimation for system, policy, security and etc.?
-Cost for system development (developing a detailed system design in terms of technical and operational characteristics), infrastructure and running cost.
-What will be the benefit to the society, economy and security?

Discussion and study how to optimize future planned program of satellite in Mongol.

-Policy for satellite launching and its encouragement.
-How much costs for system development (developing a detailed system design in terms of technical and operational characteristics), infrastructure and running cost.
-Appropriate application and technology in Mongol case.
-Benefit to the society, economy and security in Mongol.

Discussion with Japanese government regarding;

-Status of satellite application in Japan
-Policy and regulation for satellite
-Vision and Strategy for satellite utilization
(Communication. Monitoring & Control, launch and operation, sensing, application)

Discussion, presentation and exchange information related to satellite infrastructure through application with JAXA, NiCT, KDDI and relevant organization. Including study mission tour;

-Study mission tour
1. Satellite and launch system and its service/application/operation at JAXA
2. Service by latest technology of Tele-communication and application through satellite at NiCT
3. Related facilities related to satellite

-Research and study items with the organization of Japan team and relevant

1. Case Study on current ICT and Remote Sensing infrastructure in Mongolia including policy, regulation, application, etc.
   (Technology for sensing of resources and environment, exchange information/data traffic and communications, and strategy/design/operation/maintenance)
2. Research needs for launching satellite both communication and remote sensing satellite
3. Research new satellite applications such as mining, rural communication, emergency communication etc. for supporting economic development in Mongolia.
   (Research what kind/type of applications and contents in various area, and check affordable application)
4. Research small satellite capabilities suitable for Mongolian needs such us nano satellites, mini satellites
5. Ground infrastructure development such us TT&C, Ground TX/RX station etc.
   (Telemetry, Tracking and Control, and facilities for the earth station)
6. Cost estimation for designing, manufacturing and launching satellites in Mongolia

-Practical experiment (computer

1. Evaluation of application software regarding satellite services mentioned above.
2. Simulation and design of above items, if applicable.
3. Communication with Japan team

3. General Information of Mongolia

Mongolia is located in Central Asia between Russia and China

Area: **1,564,115.75** km² **(19 th), 603.909** sq mi

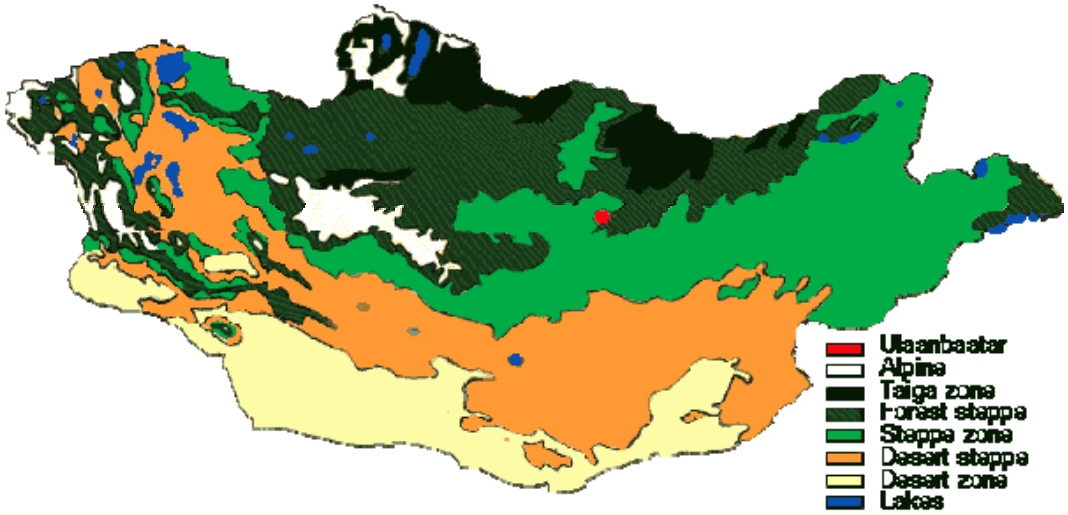
Population: 2013 census of **2.8 million, Density 1.84** km² **(236th)**

Ethnic groups: (2010) 95.35% Mongols, 3.86% Kazakhs, 0.80% others

Capital and largest city ULAANBAATAR

Different regions of the country differ considerably from each by structure of relief and elevation. Such geographic traits of Mongolia determine the severe nature, sharp continental climate and frequently unfavorable weather conditions.

The country has extensive natural resources, minerals, fossils fuels, forests and vast area of grassland. The major portion of these resources is untapped. Distributed population Still Nomadic tradition and way of naturally selected grazing of Horses, Camels, Cows, Sheep, Goats.



Why we need to develop space technology in our country?

- Broadband and Broadcasting
- Disaster risk management system
- Explore mining resources
- ICT benefits into nation wide
- Natural and environmental management

4. Project Outline:

A-1. Objectives:

The objective of the project is to identify and analyze all aspects like cost, benefit and risk of the satellite launching and operation, policy and application in Mongolia. Study on how to build up appropriate infrastructure and application for satellite system in Mongolia.

A-2. **Current status:**

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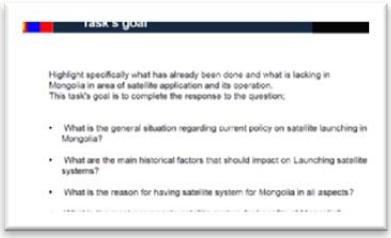
During studying communication satellite we have seen that Mongolia could launch even small Earth observation satellite for specific purposes.

A-3. **Task's goal**

Highlight specifically what has already been done and what is lacking in Mongolia in area of satellite application and its operation.



This task's goal is to complete the response to the question;

- *What is the general situation regarding current policy on satellite launching in Mongolia?*
- *What are the main historical factors that should impact on Launching satellite systems?*
- *What is the reason for having satellite system for Mongolia in all aspects?*
- *What is the most appropriate satellite system for benefits of Mongolia?*

A-4. **Mongolian Strategy and Plan**

- Technical and Economical Feasibility Study and Preliminary Design for National Communication and Remote Sensing Satellite Launching Project.

- "Mongolian National satellite project" approved by Mongolian Government. The project was included following activities:

    1. Improving legal environment to promote space technology development;
    2. Developing long term strategy for space industry development,
    3. Developing national communication satellite system,
    4. Developing national earth observation satellite system,
    5. Promote international cooperation for the space technology development,
    6. Human resource development.

- National Space Council

    40 members including space technology related researches, specialists and government bodies.

- Communication and Earth observation satellite ground stations,

  To identify potential locations to host the Space Control Center for the satellite that will soon be ordered.

- Request for information

  To help make a decision on who will be our potential partner.

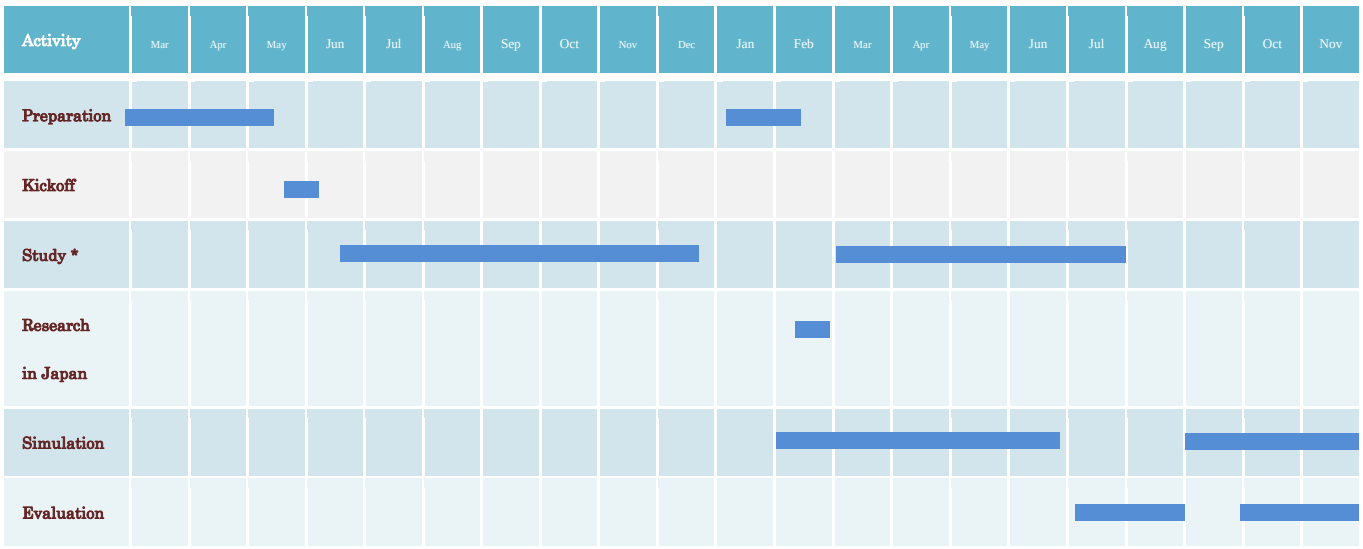
- **Technical and Economical Feasibility Study and Preliminary Design** for National Communication and Remote Sensing Satellite Launching Project.
- **"Mongolian National satellite project"** approved by Mongolian Government. The project was included following activities:
  1. Improving legal environment to promote space technology development;
  2. Developing long term strategy for space industry development,
  3. **Developing national communication satellite system**,
  4. **Developing national earth observation satellite system**,
  5. Promote international cooperation for the space technology development,
  6. Human resource development.
- **National Space Council**
  - 40 members including space technology related researches, specialists and government bodies.
- **Communication and Earth observation satellite ground stations,**
  - To identify potential locations to host the Space Control Center for the satellite that will soon be ordered.
- **Request for information**
  - To help make a decision on who will be our potential partner

5. Project Activities timeline

Our projects was conducted with the kick-off and survey in Mongolia, Study at home countries, Research in Japan, and final conclusion in Mongolia;

- Initiative of the project, Satellite Forum and kickoff.
- Study, Simulation system and Research.
- Evaluation and Conclusion.

Project timeline in 2012 and 2013



Most significant and major activities in this project were mainly 3 parts such as kickoff meeting in Mongolia (Jun. 2012), Research in Japan (Feb. 2013) and Conclusion in Mongolia (Nov. 2013).

Initiative and preparation, and kickoff meeting with Satellite Forum in Mongolia
Research satellite matters in Japan with courtesy visit
Study and Simulation the satellite in Mongolia
Evaluation and conclusion

By several reasons, after discussions relevant to those events schedule by e-mail and phone, we had to postpone the events schedule and close date. Hereinafter, above schedule was finally executed by us, and completed our Apt J2 project on Nov. 2013.

Our accounting was closed afterward due to collecting the receipt and so on.

Following section are described the detailed activities and results in each major event;

6. Kickoff and Study in Mongolia

Kickoff meeting at Ulaanbaatar, Mongolia

Place: ITPTA

Activities: Understanding, Planning and Discussion regarding our project and timeframe.

Detailed and result of meeting are refer to Appendix A-1.Kickoff document

Discussed:

Mutual understanding of objectives, role and activities,

Timeline, and its Activities, Procurement

Rough activities for Study and research in Tokyo

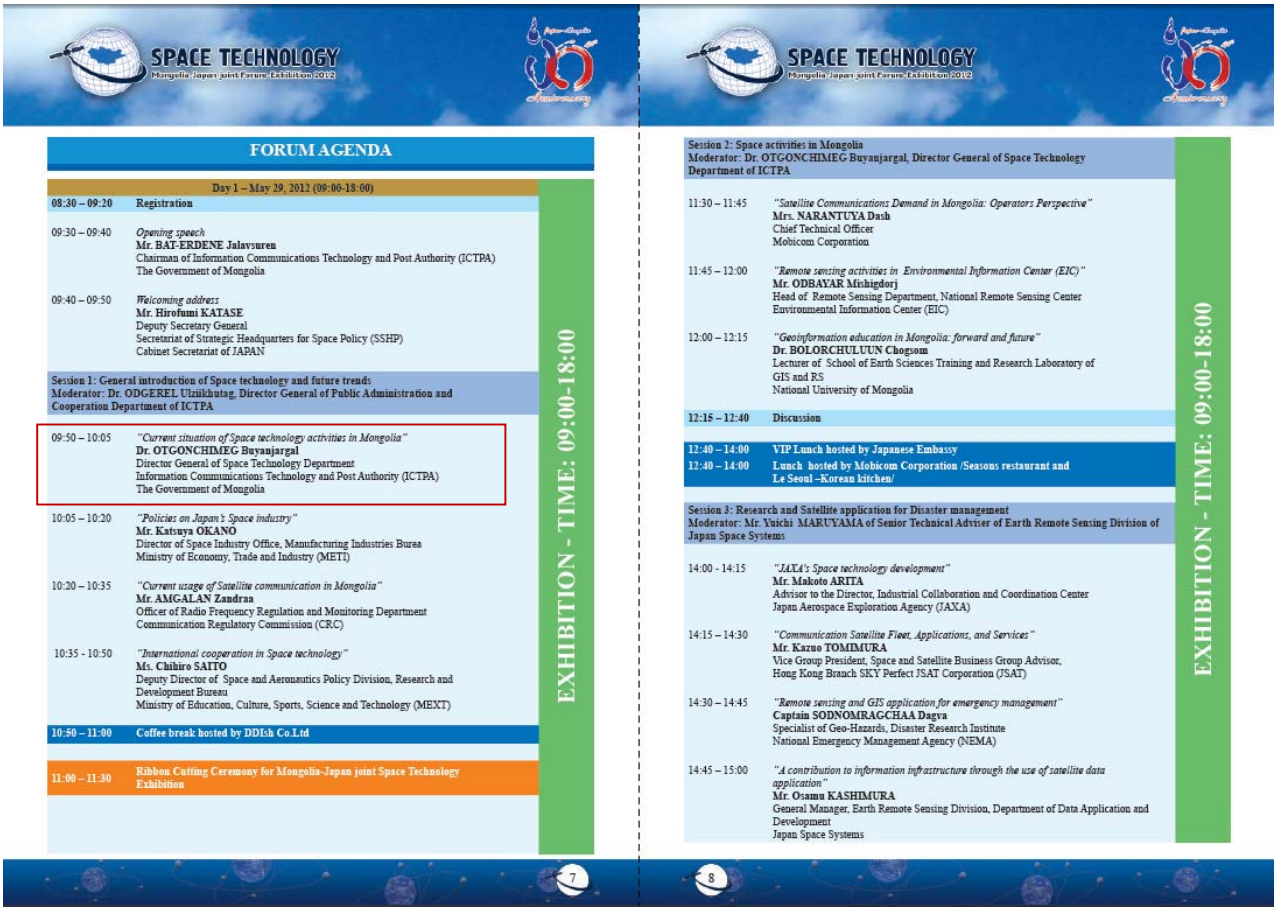
- Before the kickoff meeting in Mongol, Japanese team discussed about team activities.

Research in Mongolia

Place: Ulaanbaatar, Blue Sky Tower.

Activities: Participation by Japanese researcher in Mongolia-Japan Joint Forum Exhibition-2012

This forum was organized by Japanese governments and organizations and Mongolian governments and relevant organization, main organizing committee was Space Technology Department, ITPTA(same of APT J2 Mongolian team), Director Otgonchimeg presented "Current situation of Space technology activities in Mongolia.



SPACE TECHNOLOGY
Mongolia-Japan joint Forum-Exhibition 2012

FORUM AGENDA

Day 1 – May 29, 2012 (09:00-18:00)

08:30 – 09:20	**Registration**
09:30 – 09:40	*Opening speach* **Mr. BAT-ERDENE Jalavsuren** Chairman of Information Communications Technology and Post Authority (ICTPA) The Government of Mongolia
09:40 – 09:50	*Welcoming address* **Mr. Hirofumi KATASE** Deputy Secretary General Secretariat of Strategic Headquarters for Space Policy (SSHP) Cabinet Secretariat of JAPAN
Session 1: General introduction of Space technology and future trends **Moderator: Dr. ODGEREL Ulziikhutag, Director General of Public Administration and Cooperation Department of ICTPA**	
09:50 – 10:05	*"Current situation of Space technology activities in Mongolia"* **Dr. OTGONCHIMEG Buyanjargal** Director General of Space Technology Department Information Communications Technology and Post Authority (ICTPA) The Government of Mongolia
10:05 – 10:20	*"Policies on Japan's Space industry"* **Mr. Katsuya OKANO** Director of Space Industry Office, Manufacturing Industries Burea Ministry of Economy, Trade and Industry (METI)
10:20 – 10:35	*"Current usage of Satellite communication in Mongolia"* **Mr. AMGALAN Zandraa** Officer of Radio Frequency Regulation and Monitoring Department Communication Regulatory Commission (CRC)
10:35 - 10:50	*"International cooperation in Space technology"* **Ms. Chihiro SAITO** Deputy Director of Space and Aeronautics Policy Division, Research and Development Bureau Ministry of Education, Culture, Sports, Science and Technology (MEXT)
10:50 – 11:00	**Coffee break hosted by DDIsh Co.Ltd**
11:00 – 11:30	**Ribbon Cutting Ceremony for Mongolia-Japan joint Space Technology Exhibition**

EXHIBITION - TIME: 09:00-18:00

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SPACE TECHNOLOGY
Mongolia-Japan joint Forum-Exhibition 2012

Session 2: Space activities in Mongolia **Moderator: Dr. OTGONCHIMEG Buyanjargal, Director General of Space Technology Department of ICTPA**	
11:30 – 11:45	*"Satellite Communications Demand in Mongolia: Operators Perspective"* **Mrs. NARANTUYA Dash** Chief Technical Officer Mobicom Corporation
11:45 – 12:00	*"Remote sensing activities in Environmental Information Center (EIC)"* **Mr. ODBAYAR Mishigdorj** Head of Remote Sensing Department, National Remote Sensing Center Environmental Information Center (EIC)
12:00 – 12:15	*"Geoinformation education in Mongolia: forward and future"* **Dr. BOLORCHULUUN Chogsom** Lecturer of School of Earth Sciences Training and Research Laboratory of GIS and RS National University of Mongolia
12:15 – 12:40	**Discussion**
12:40 – 14:00	**VIP Lunch hosted by Japanese Embassy**
12:40 – 14:00	**Lunch hosted by Mobicom Corporation /Seasons restaurant and Le Seoul –Korean kitchen/**
Session 3: Research and Satellite application for Disaster management **Moderator: Mr. Yuichi MARUYAMA of Senior Technical Adviser of Earth Remote Sensing Division of Japan Space Systems**	
14:00 - 14:15	*"JAXA's Space technology development"* **Mr. Makoto ARITA** Advisor to the Director, Industrial Collaboration and Coordination Center Japan Aerospace Exploration Agency (JAXA)
14:15 – 14:30	*"Communication Satellite Fleet, Applications, and Services"* **Mr. Kazuo TOMIMURA** Vice Group President, Space and Satellite Business Group Advisor, Hong Kong Branch SKY Perfect JSAT Corporation (JSAT)
14:30 – 14:45	*"Remote sensing and GIS application for emergency management"* **Captain SODNOMRAGCHAA Dagva** Specialist of Geo-Hazards, Disaster Research Institute National Emergency Management Agency (NEMA)
14:45 – 15:00	*"A contribution to information infrastructure through the use of satellite data application"* **Mr. Osamu KASHIMURA** General Manager, Earth Remote Sensing Division, Department of Data Application and Development Japan Space Systems

EXHIBITION - TIME: 09:00-18:00

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Attached is the whole pamphlet for the forum

7. Research in JAPAN

Below activities were executed in Japan, organized by Japanese team;

1. Discussion and lecture at KDDI foundation regarding ITU-RRB activities
2. MIC JAPAN (Policy and Current situation)
3. ITU activities
4. NICT Kashima
5. JSAT Discussion
6. JAXA Sagamihara
7. KIT presentation
8. NEC Sagamihara
9. Conclusion

Research in Japan:

Research and study Area was so various from preparation of Spectrum allocation through technology of satellite environment in space, Satellite Applications.

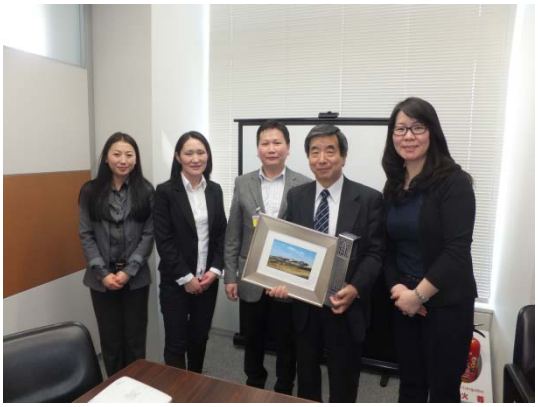
Place: Iidabashi, KDDI Foundation office.

Activities: ITU Activities (RRB) : Spectrum management.

The lecturer: Yasuhiko ITO (KDDI foundation President, ITU RRB board Member)

· Frequency allocation and Orbit Resources;

· A typical procedure for a satellite network and practical measures/statistics of committee;

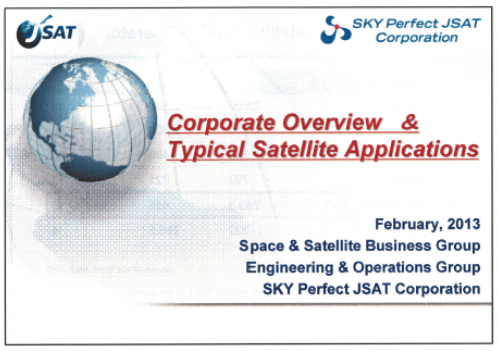


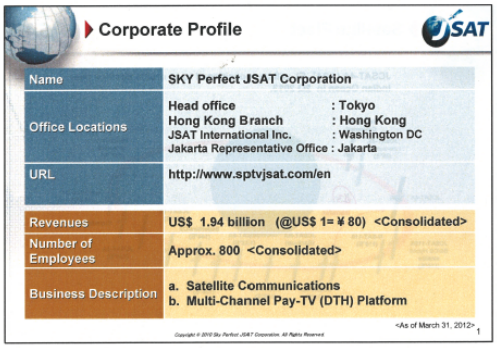
Place: Yokohama, JSAT Satellite Control Center

Activities: Broadcast satellite service: site visit and discussion.

The lecturer: Eiji Sato (Chief engineer of JSAT Company)

- Communication Satellite Business;
- Cooperation on CS business and activities;

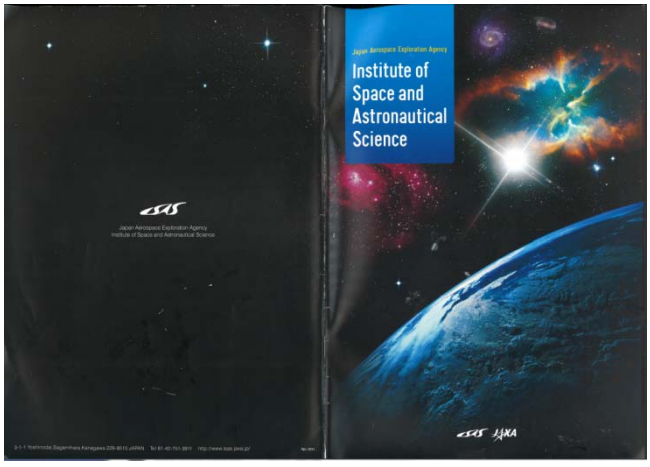


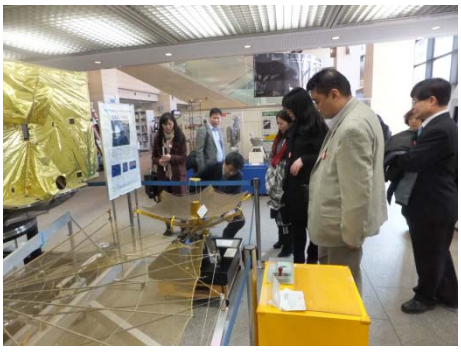


Place: JAXA Sagamihara Campus.

Activities: Research satellite: visit and discussion

- Research and experiments on space technology;
- Testing and new technology development laboratory;



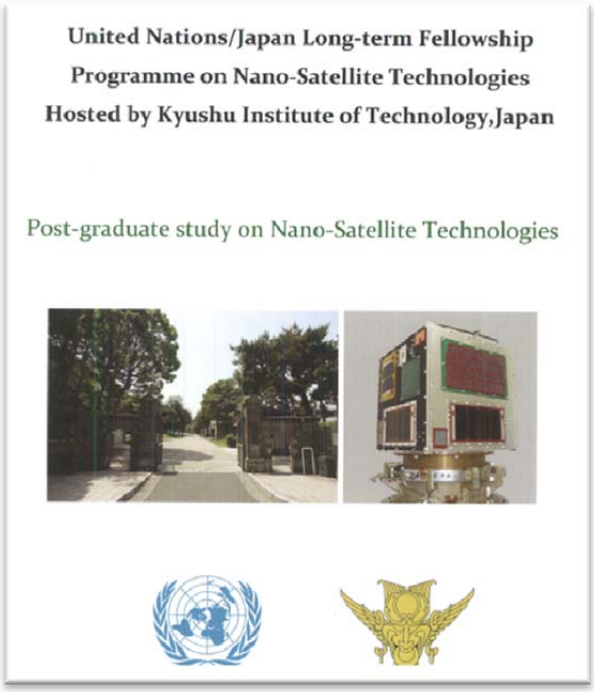


Place: Iidabashi, KDDI Foundation office.

Activities: Study of environment at satellite position and itself by KIT

Lecturer: Amgalanbat .B (Researcher in KIT)

- Spacecraft systems engineering;
- Space vehicle design;



Place: Sagamihara, NEC Campus

Activities: Study EO Satellite sensor and bus system technology.

The lecturer: Ozawa Atsushi (Engineer of NEC company)

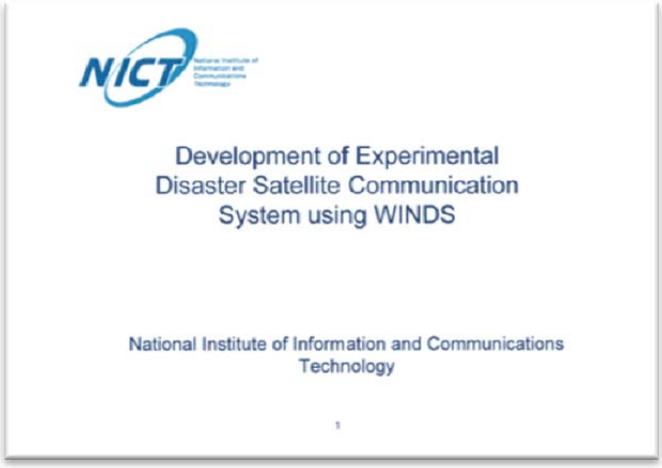
- EO satellite payload, bus system technology and design;
- Space craft components and materials;

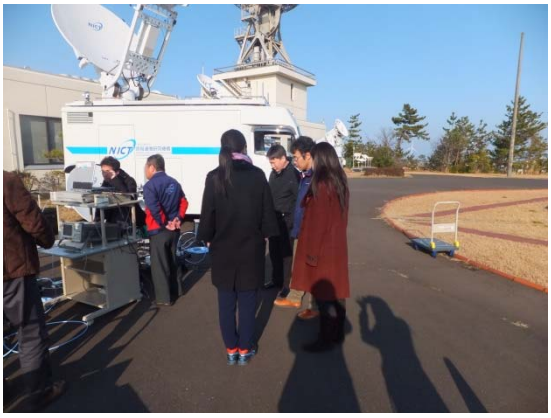
Place: Kashima, NICT

Activities: WINDS satellite and other service at NICT.

Lecturer: Takashi Takahashi (Research Manager in NICT)

- Experiments using on WINDS satellite;
- Technology developing laboratory;



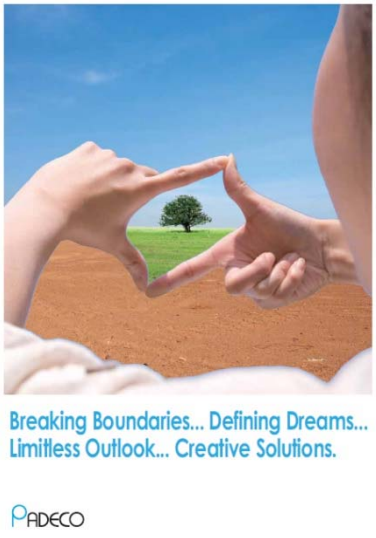


Place: Onariomon, PADECO Company

Activities: Project introduction and other activities

Lecturer: Akira Akasaka

- Discussion on feasibility study report;
- Other activities on consulting service;

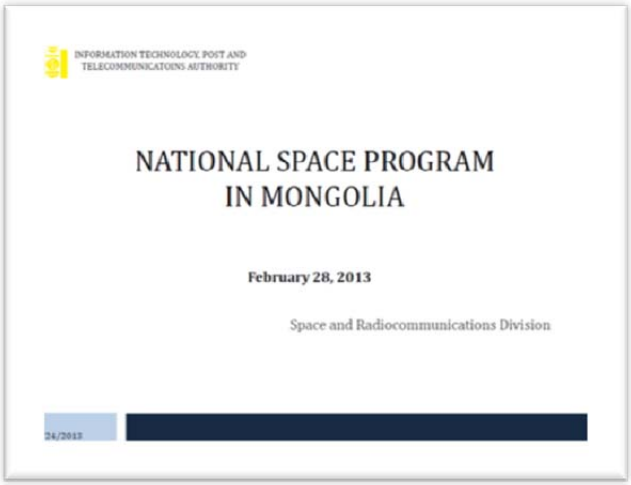


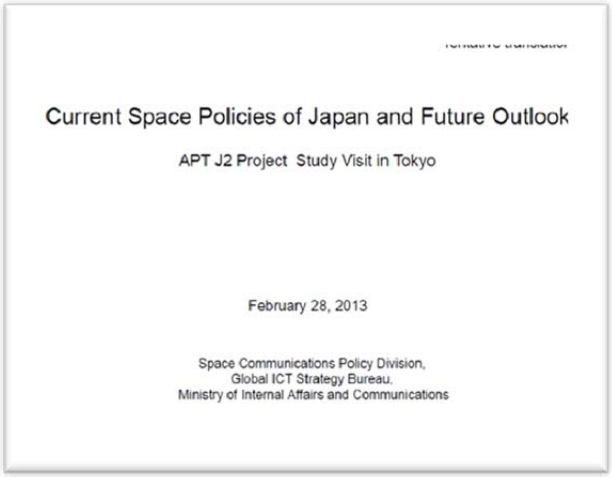
Place: Ministry of Internal Affairs and Communications.

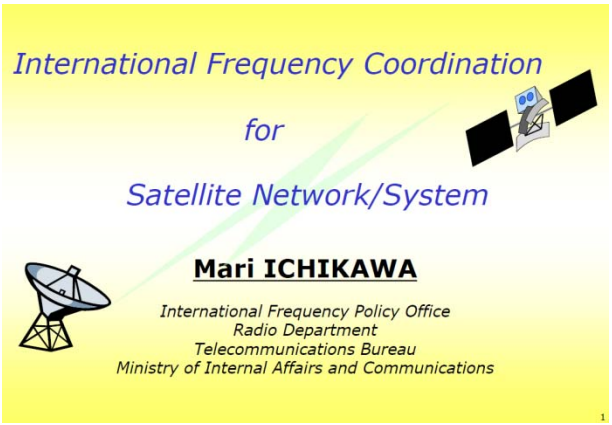
Activities: Japan Communications Program in Space

Lecturer: Kauhiro Fukuda (Deputy Director of Space Communication Policy Division)

- Current Space Policies of Japan and Future Outlook;
- International Frequency Coordination for Satellite Network /System;





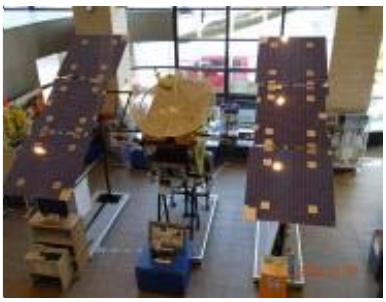


Research in Japan

ITPTA KDDI Foundation

Place: Ministry of Internal Affairs and Communications.
Activities: ***Japan Communications Program in Space***
Lecturer: Kauhiro Fukuda (Deputy Director of Space Communication Policy Division)

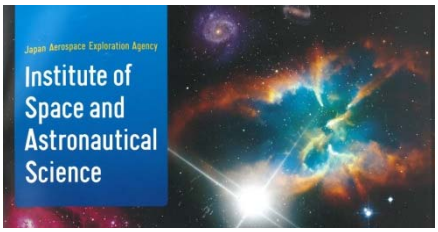
- Current Space Policies of Japan and Future Outlook;
- International Frequency Coordination for Satellite Network /System;

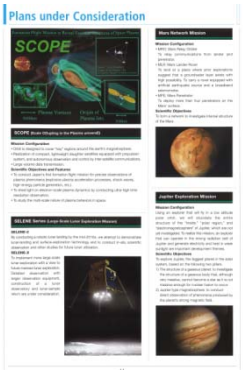


Place: Onariomon, PADECO Company
Activities: ***Project introduction and other activities***
Lecturer: Akira Akasaka

- Discussion on feasibility study report;
- Other activities on consulting service;

8/16/2013 | 10th APT and ICT Development Forum (ADF-10)





Wide area coverage of one-third of the globe

Because a conventional satellite covers a wide area with a fixed beam this results in diffusion of the signal and prevents high capacity communication. The active-phased array antenna (APAA) newly developed by the WINDS Project controls directions of spot beams electronically and concentrates the signal on areas where communication is taking place in high volumes. This enables ultra high-speed communication over a wide area, including the entire Asia-Pacific region.

NICT National Institute of Information and Communications Technology

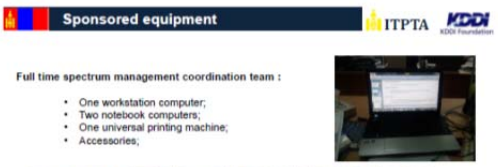
Development of Experimental Disaster Satellite Communication System using WINDS

National Institute of Information and Communications Technology

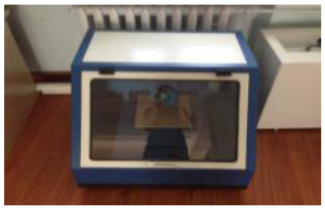
8. Research and study by the procured system in Mongolia

Full time spectrum management coordination team

- One workstation computer;
- Two notebook computers;
- One universal printing machine;
- Accessories;
- Simulation;



- One Notebook computers;
- Projector;
- Accessories;



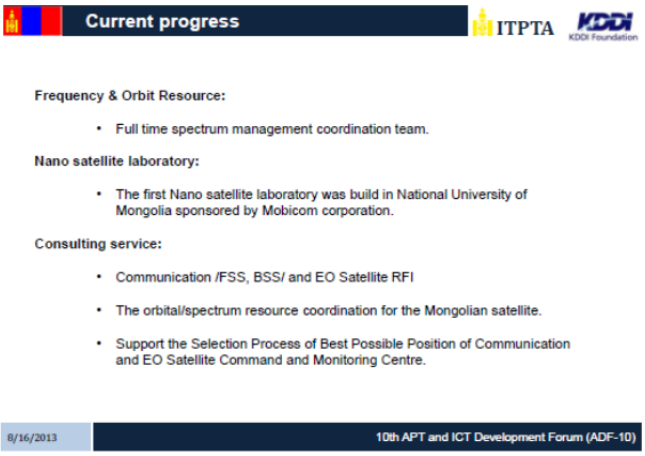
9. Current Progress

Most of progress are based and refer to our project J2 as well as another Japanese one.

1. Frequency & Orbit Resource:
   - Full time spectrum management coordination team. Spectrum Management for launching/operation of satellite as well as her location
   - By using the purchased computer and software also simulation of satellite parameters and environment.

2. Nano Satellite Laboratory as well as can-satellite to have human Resource Development
   - The first Nano satellite laboratory was build in National University of Mongolia sponsored by Mobicom corporation.
   - Support their activities and events,

3. Consulting for organizations relevant to satellite launching and its characteristic.
   - Communication /FSS, BSS/ and EO Satellite RFI
   - The orbital/spectrum resource coordination for the Mongolian satellite.
   - Support the Selection Process of Best Possible Position of Communication and EO Satellite Command and Monitoring Centre.



10. Final Evaluation, Research and Study in Mongolia

1. Nano satellite Laboratory
2. Discussion of results
3. Conclusion

Evaluation and conclusion in Mongolia

1. Strategy and Current situation in satellite
2. Can/Nano Satellite trials
3. Meteorological office
4. Naran Earth station for satellite communication

Final meeting for this project at Ulaanbaatar, Mongolia
Place: ITPTA
Activities: Evaluation and discussion
of our project activities and report
of Procurement for improvement
of Future plan

Place: Ulaanbaatar, National University of Mongolia
Activities: “CANSAT” First National Competition
Lecture of Satellite at the class room

- Can-sat training;
- Team competition;

Place: Ulaanbaatar, Environmental Information Center,

Institute of Meteorology, Hydrology and Environment

Activities: Study of Weather information in Mongolia

Place: Ulaanbaatar, Satellite Earth Naran Station,

Institute of Meteorology, Hydrology and Environment

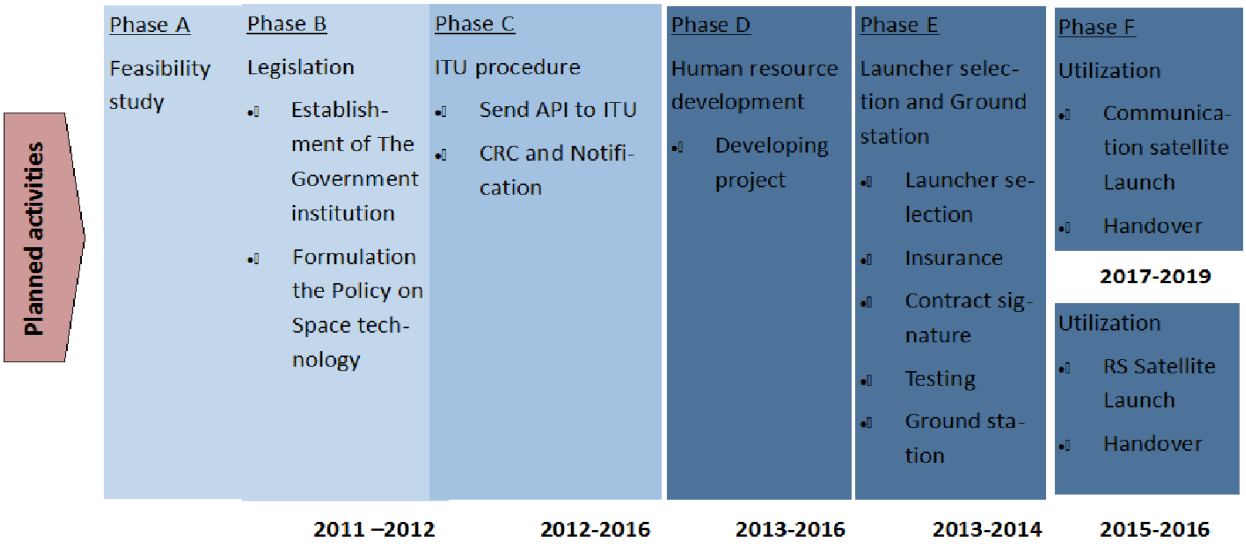
Activities: Study of current communication satellite operation in Mongolia

11. Next step

To Implement National Satellite Project with developed countries, which has space technology and industry

Communication Satellite;

Earth Observation Satellite:



FROM ITPTA white paper, 2013 as below;

3.2 SEVEN STRATEGIC OBJECTIVES FOR REFORMING THE ITPC SECTOR

The Government of Mongolia is introducing “Seven objectives for reform” in its activities which will be implemented from 2012 to 2016 and has undertaken a number of measures in conformity with other national programs

STRATEGIC OBJECTIVE 1 “NATIONAL SATELLITE”

1.1 Implement “Communications Satellite” project that will allow us to ensure national security, use of redundant networks for emergency cases, deploy new services for distance learning and telemedicine and delivering information communications services to rural population.

1.2 Launch a high resolution remote sensing satellite and widely use it for city planning and mining industry

1.3 To create and update geographic information system and database, to utilize navigation and positioning systems into other fields

1.4 Establish a National Remote Sensing Center and provide to infrastructure and agricultural sectors with various information

12. Accounting

Refer to Appendix A-7 Accounting report in detail.

Our project general accounting results is as follow

Approved budget by APT	50,760.00-US$
Total amount of expense	3,697,947JPY
pre -remittance (60%)	2,386,096JPY (equivalent 30,400.00US$)
Requesting rest of amount	1,311,851JPY

Evaluation of Budget vs. Expense

Maximum allowed budget based on 60% payment by US$:

50,760.00 – 30,400.00 = 20,360.00 US$

Requesting amount estimated by recent currency exchange rate:

104.88JPY/US$: TTS on APR 03, 2014 (estimated rate)

Amount of budget by APT

2,386,096 + 20,360.00 x 104.88 = 4,521,452 JPY

Evaluation

Budget 4,521,452 - Expense 3,697,947 = 823,505 JPY > 0

Result:

Within the amount of the budget approved by APT

13. Conclusion

By Mongolian team;

- APT J2 “Study on national satellite application of Mongolia" project is implementing successfully.
- KDDI Foundation is organizing the project activities very efficiency.
- ITPTA and the project team members are getting the good knowledge and know how.
- ITPTA will be open to share space technology know-how and experience.

14. Acknowledgement

On behalf of the APT J2 Project team for “Study on national Satellite Applications in Mongolia”, we would like to gratefully thank to the following people who kindly have provided with full cooperation to support this project until it gets successful;

The officials and staffs of APT
The officials and staffs of Japan’s Ministry of Internal Affairs and Communications, Japan
The officials and staffs of SKY Perfect JSAT Corporation, Yokohama Satellite Control Center
Reference of material (ITU-RRB), Orbit/Spectrum Allocation Procedure
The officials and staffs of JAXA (Japan Aerospace Exploration Agency), Sagamihara
The officials and staffs of NEC Corporation, Sagamihara Plant
The officials and staffs of PADECO Co., Ltd, Japan
The officials, staffs and students of National University of Mongolia, School of Physics and Electronics
The officials and staffs of the Metrological Office in Ulaanbaatar, Mongol
The officials and staffs of the Naran earth station in Mongol
The officials and staffs of NICT (National Institute of Information and Communications technology), Kashima Space Technology Center
The professor, officials and staffs of Kyushu Institute of Technology, Laboratory of Spacecraft Environment Interaction Engineering
The officials and staffs of ITPTA (Information Technology, Post and Telecommunication Authority, Mongolia)
The officials and staffs of KDDI Foundation, Japan

15. Appendix:

A-1. Kickoff document (Agenda and Conclusion)

Before the kickoff meeting with Mongolian team, Japanese team discussed how to proceed this project and roles. Mr. Amgaranbat joined, at this time, as one of Mongolian team. He recently moved from Mongolia to Kyushu, Japan for studying regarding satellite technology. his position was moved from Mongolian team to Japanese team because he belonged to Kyushu Institute of Technology, temporary resigned from ITPTA.

Meeting Memorandum

2012/04/27(Ver.05/08final)
KDDI foundation

1. Meeting 1st Face-to-Face Japanese team meeting for APT J2 HRD Project in Mongol, 2012

2. Date April 27 (Friday), 2012 13:30 – 16:00

3. Venue Meeting room at KDDI foundation, Bunkyo, Tokyo

4. Participants

Mongolian team:
Kyushu Institute of Technology
Mr. Amgalanbat Batsuren

Japanese team:
Ministry of Internal Affairs and Communications, Japan (MIC)
Mr. Takeshi Hirose
National Institute of Information and Communication Technology (NiCT)
Dr. Maki Akioka
Japan Aerospace Exploration Agency (JAXA)
Mr. Takayuki Kawai
Ms. Azusa Sakamoto
KDDI Foundation (Organizer of this meeting)
Dr. Yasuhiko Ito
(President of KDDI foundation: Introduction of this project with Mongol)
Mr. Yosuke Uchiyama (Accounting Manager of this project)
Mr. Junichi Osawa

5. Reference Agenda (as of April 26, 2012 KDDI foundation), The proposal to APT

6. Discussion

(1) Introduction of each member and organization, background

Mr. Batsuren introduced about current situation such as the projects being implemented (Feasibility Study as business oriented: with Japanese consultant company) in parallel. REF: APT Project is HRD oriented.

(2) Review and mutual-understand of project objectives and each activity based on Mongolian requirement and desire conducting by Mr. Batsuren. And then, Research and Study items

Research and Study will have 2 parts such as (1) policy and management issues and (2) Technical and simulation issues. But not divide 2 parties also only one party. Therefore, our activities includes from upper stream through lower stream for HRD purpose but not focused on detailed/deep level. (such Geometrical Vs. remote sensing, launching Vs. operation and etc.)

Our Activities of Japanese team will be (1) providing material/information/data and site visit relevant to each organization activity (2) Mongolian team will research and compare the status/situation/level of Mongolian side with these contents provided by Japanese team. (3) Activity report will own by ICTPA and Accounting report will owned by KDDI foundation.

Mongolian team will study the hardware and software for satellite orbit/operation simulation.
Dr. Akioka and Mr. Kawai stated about free version of STK(Satellite Tool Kits) as an example. We will discuss the suitable system in conjunction with the limitation of APT budget.
The participants jointly agreed that new hardware and software should be provided for Mongolian team. Mr. Batsuren is requested to send detailed information about the hardware, software and related equipments.

(3) Rough whole schedule and kickoff meeting

Discussion regarding how many days in Tokyo meeting and exchange researchers in Mongol. (In case of 10 days, we may have site research in Tanegashima as well as NiCT at Koganei/Kashima and JAXA at Tukuba)

2 researchers (Mr. Batsuren and Mr. Uchiyama) will attend the Kickoff meeting in Mongolia. The Date will be discussed with Mr. Batsuren and ICTPA. Mr. Batsuren suggested that Kick-off meeting can be during or after the Japan-Mongolia space sector joint conference at the end of May, 2012.

(4) Tentative roll and responsibility (proposed)

Mr. Uchiyama stated the tentative roll and responsibility by each activity for put it on the table of the kickoff meeting discussion.

Mr. Kawai asked the definition of “Cost related” activity. Mr. Uchiyama proposed each activity should be included cost issue not independent issues. We agreed to delete (12) Cost related.

Mr. Uchiyama stated to looking any comments before kickoff meeting

(5) Request to coordination by Mr. Batsuren with ICTPA

Acceptance letter to APT from ICTPA (Through focal point of APT), ASP.
Notice us and APT with above regarding new department in charge and revise Mongolian member list with individual background career.

(6) Request each of members regarding accounting procedure

Format and items of receipt (especially “address to : KDDI foundation”)
Decision making of procurement

7. Next meeting

The next meeting will be taken place after the kickoff meeting in Mongolia .

We will discuss of preparation of Tokyo meeting and research visits in Japan with Mongolian team.

8. Conclusion

We all agreed that we will execute this project with Mongolian team and successfully get fruitful achievements.

Agenda

May 30, 2012
KDDI foundation

1. Introduction of each member and organization
2. Review of our proposal and introduction of past projects
   (1) General and past APT projects
   (2) Objectives of our APT project
   (3) Member update: Confirm new members and know relevant staffs/persons
3. Breakdown Requirement from Mongol based on the proposal
   (1) Mission and Target by Mongol and expected outcome
   (2) Proposed milestone
   (3) Practical activities and detailed items for study/research
   (4) Approved budget from APT
   (5) Explain Accounting procedure for procurement and travelling by KDDI foundation
4. New Schedule
   (1) Rough whole schedule (Milestone) and assignment
   1st Japan team Face-to-Face meeting (Apr. 27), Kickoff and Satellite Forum (May 28 thru 31), Study in Japan, Procurement, Research and discussion in Mongol, APT report and etc.)
   (2) Interface with Satellite Technology Forum
   Collaboration and Distinguish between two projects
5. Roll of each organization(Tentative)

(1)	Leader, reporting and executive management	ICTPA
(2)	Project Coordination	ICTPA / KDDI foundation
(3)	Accounting	KDDI foundation
(4)	Coordination between two projects	ICTPA
(5)	Kickoff meeting	ICTPA & KDDI foundation
(6)	Coordination of visit in Japan	KDDI foundation
(7)	Study Visit and Discussion in Japan	Whole members and relevant
	Coordination	KDDI foundation
(8)	Visit at each site of Main Member in Japan	MIC Japan, NiCT, JAXA, KDDI f.
(9)	Summarizing the activity report ICTPA	
(10)	Procurement, reimbursement and Accounting report	KDDI foundation
(11)	Consolidate two reports and send to APT	ICTPA

6. Next Activities and date

(1) Discussion distinguish/collaboration/cooperation with Satellite Technology Forum
(2) Date and Activities in Japan in APT J2 Project
(3) Rough discussion about procurement and relevant items
(4) Discussion Tokyo meeting of APT J2 and general schedule of APT J2
(5) Rough discussion about procurement and relevant items
(6) Making MoU with signature for executing APT J2 project.

Annex 1

Procedure

1. Acceptance of APT selection(done) and Kickoff
2. Revise collaborative expert/staff list (Through ICTPA) : Japanese team as well as Mongolian team (organization restructure and change Leader?) if any.

   Communication and Advanced technology department : Director (Ms Dr. Otgonchime)
3. Required above researcher's/Engineer's Career Background sheets
4. Prepare next step

   Understanding of the project and roll/responsibility

   Report result of meeting and survey

   Preparation of Tokyo research and study trip

   (Relevant to researcher exchange into Mongol)

   Report to APT (Interim and Final : Activity and Accounting)

Budget

-	Travel expense	22,200 USD
-	Daily Allowance and Accommodation fee	14,100 USD
-	Correspondence expenses and shipping fee	2,800 USD
-	Equipment purchase expenses	7,000 USD
-	Miscellaneous	4,660 USD
	TOTAL AMOUNT	**50,760 USD**

Request Accounting procedure

- Required receipt for any reimbursement, such as equipment, service, transportation

  In keeping with
  - 1. APT condition and term
  - 2. Law, rule and regulation in Japan and Mongol
  - 3. Accounting procedure
  - 4. For this project
- Purchase and procurement shall be decided by Mongolian team and Japanese team
  - Request to decide one person in each team, who has responsibility to decide
  - Purchase should be agreed with above 2 persons
- Receipt should be:
  - Address to KDDI Foundation
  - Title "Receipt" or "INVOCE" with "PAID" (or equivalent in case)
  - Date of payment (recipient process date)
  - Amount USD, JPY, TUG(?)

- Description of each item, unit price and sub-total
- Name of payment recipient with address/tel
- Signature or official stamp
- *Receipt with the official currency exchange rate sheet is appreciated if any.
- *Bank transfer requires several information such as SWIFT code and etc.

Activity and Minute

June 5, 2012 (Ver. 01)

Date: May 28, 2012

Meeting is cancelled due to Flight cancellation (Flight was cancelled due to heavy wind at Ulaanbaatar Airport. Japanese team waited at Seoul one night and arrived on midnight May 28. We had one day missing.)

ICTPA also has another project with Japanese government and private sectors as Mongolia -Japan joint project of FS (Fusibility Study), and they hold the Space Technology Forum – Exhibition on My 29-30.
In order to understanding the situation of Satellite in Mongolia, get cooperation with project FS, getting knowledge of other's information and understand requests/demand of ICTPA.

Date: May 29, 2012
Place: Blue Sky Tower and Hotel at Ulaanbaatar, Mongol
Activity: Space Technology Forum and exhibition

In session 1:
- Greeting by Chairman of Information Communications Technology and post Authority (ICTPA) of Mongolia and Director, Cabinet Secretariat of Japan

- Introduction by
Dr. Otgonchimeg of Information Communications Technology and post Authority(ICTPA) in Mongolia,

Ministry of Economy, Trade and Industry of Japan,

Communication Regulatory Commission (CRC) in Mongolia,

Ministry of Education, Culture, Sports, Science and Technology of Japan

*Dr. Odgerel Ulziikhutag (Mr.), Director General, Public Administration and Cooperation Department, Information Communications Technology and post Authority (ICTPA) of Mongolia is as the moderator who is APT focal point

In session 2:
Space activity in Mongolia

In session 3:

Research and Satellite application for Disaster Management

In session 4:

Space industry

In closing remarks:

Chairman of Information Communications Technology and post Authority(ICTPA) in Mongolia

Director, Ministry of Economics, Trade and Industry in Japan

Welcome party

Date: May 30, 2012

Place: Blue Sky Tower and Hotel, at Ulaanbaatar, Mongol

Activity: Space Technology Forum and exhibition

In session:

Discussion and meeting with Information Communications Technology and post Authority(ICTPA), Communications Regulatory Commission (CRC) and Japanese delegation of project FS

Exhibition and Lecture by Mongolian and Japanese organizations

*Mongolia-Japan joint FS is organized:

by Information Communications Technology and post Authority(ICTPA),

Communications Regulatory Commission (CRC) in Mongolia

and Strategic Headquarters for Space Policy, Ministry of Economy, Trade and industry(MITI), Ministry of education, Culture, Sports, Science and Technology(MEXT), (Japan Aerospace Exploration Agency(JAXA) in Japan

Co-organizers:

MobiCom, DDISHTV Skytel in Mongolia and PADECO in Japan

Supporting by:

National University of Mongolia, The school of Geography and Geology, Training and Research laboratory of Geographic information System and Remote Sensing, National Agency for Meteorology and Environment Monitoring (NAMEM) Environmental Information Center (EIC) in Mongolia,

And IHI Aerospace Co.,Ltd, NEC Corporation, PASCO corporation, SKY Perfect JSAT Corporation, Mitsubishi Heavy Industries, LTD, Sumitomo Corporation, and PADECO Co., Ltd., (KDDI foundation) in Japan

Date: May 30, 2012

Place : Office of Information, communications technology and Post Authority (ICTPA)
Ulaaanbaatar, Mongolia

Activity: Kickoff meeting of APT J2 Project in Mongolia with Mongolian team and Japanese team

Participant:

Mongolian Team

Dr. Otgonchimeg Buyanjargal (Mrs.)	Director General of Space Technology Department, Information, communications technology and Post Authority (ICTPA)
Ms. Uranchimeg Andrai	Officer, Space Technology Department, Information, communications technology and Post Authority (ICTPA)
Ms. Bekhtsetseg Tuvsanaa	Officer, Public Administration and Cooperation Department, Information, communications technology and Post Authority (ICTPA)
Mr. Batbayar Vandansambuu	Officer, Space Technology Department, Information, communications technology and Post Authority (ICTPA)

Japanese Team

Mr. Amgalanbat Batsuren	Researcher, Laboratory of Spacecraft Environment Interaction Engineering, Kyusyu Institute of Technology, (* Information, communications technology and Post Authority (ICTPA) in the proposal)
Mr. Yosuke Uchiyama	Deputy Director, International corporation department, KDDI foundation (Accounting manager)

Discussion:

1. Introduction
   - Member (Mongolian team and Japanese team)

Information, communications technology and Post Authority (ICTPA), Kyusyu institute of technology and KDDI Foundation (newly re-organized)

- Previous APT project
- Apt J2 Project " Research and Study of National Satellite Application in Mongolia"
- Space Technology Forum

2. Member update
   - Mongolian team

     Update: Dr. Otgonchimeg Buyanjargal is replaced as chief Engineer/researcher of this project replaced from Mr. Tamir. J.

     Update: Assigned new department : Space Technology Department

     Update: Engineer/Researcher

     New

     Dr. Otgonchimeg Buyanjargal as a chief of researcher

     Ms. Uranchimeg Andrai

     Ms. Bekhtsetseg Tuvsanaa

     Mr. Batbayar Vandansambuu

     Delete

     Mr. Tamir J

     Ms. Oyuchimeg Sh

   - Discussion of other new member and his/her organization except ICTPA in Mongol Team

     Organization

     Communications Regulatory Commission of Mongolia (CRC)

     Some University in Mongol for education

     Decision of new members will be made by ICTPA

   - Japanese team

     Update: Mr. Amgalanbat Batsuren practically is changed the place as Japanese team rather than Mongolian team

   - Update Member list and Researcher's/Engineer's Career Background

     Decide new members by ICTPA including other organization in Mongol

     Revise the member list and career background of each member.

     Confirm the updated new member list by Mongolian and Japanese team

     Sent the updated member list to APT though the focal point of APT

*APT requests member who travels for this project by APT support budget shall be in the member list which APT confirmed.

3. Reconfirmation regarding Requirements and Objectives of Mongolian team
   - Main Objective is "Launch National Satellite"
   - Study in priority is "Obtain these frequency of the National Satellite"
   - APT J2 is HRD(Human Resource Development) for getting/improving knowledge of above
   - Discussion is continue regarding "Objectives, purpose and scope of this APT J2 Project"
   - Discussion was continue regarding distinguish and collaboration with the Project of "Technical and Economic Feasibility Study and preliminary design for National Communication and Remote Sensing Satellite launching" in view of such as difference and duplication.
   - ICTPA will prepare the list of requirement in detail without consideration of layer/level for further discussion (Tomorrow).

4. Rough Schedule
   - Next APT J2 Tokyo study and research trip will be discussed after fixing the date and activities of the trip supported by the Japanese Government in end of July planned.
     (information: about 13days in Japan, Mongolian delegation with about 10 persons including ICTPA, CRC from Mongolia)

5. Procurement
   - Software (12 functions planned: download free software from ITU web page) and Hardware will be discussed later, ICTPA still researching most adequate product considering functions and cost.
   - ICTPA will research and investigate the adequate and suitable software and hardware with which ICTPA will work, for such as simulation of orbit, launching and frequency assignment.
   - ICTPA and KDDI foundation are requesting to purchase all product such as PC, peripheral, LAN device, Network HDD and so on in Mongolia, even software if applicable. ICTPA will design the system and get quotation later, and we as Mongolia and Japanese team will discuss to decide the procurement and the bank transfer from KDDI foundation within the APT budget. Those procurements shall be below the budget of the category, approved by APT.
   - ICTPA requested high-performance PCs in order to process those software smoothly and speedy and get the results efficiently and timely.

6. Interface with Project of FS and PD for NCRSSL

- Two projects should be appropriately coordinated by ICTPA and relevant organization in Mongol.
- Also, KDDI foundation will be able to contact with relevant person in Project of FS and PD for NCRSSL, if required.

Date: May 31, 2012

Place : Office of Communications Regulatory Commission (CRC)
Ulaaanbaatar, Mongolia

Activity: Introducing APT J2/J3 Programme and our J2 project "Research and Study of National Satellite in Mongol"

Participant:

Communications Regulatory Commission of Mongolia (CRC)

Mr. Boldbaatar Bat-Amgalan	Chairman and CEO
Dr. T. Naranmandakh (Mr.)	Deputy Director, Secretary the Chairman's Council Legal Information and Administration Department
Mr. Amgalan Zanddraa	Officer, Radio Frequency Regulation and Monitoring Department

Japanese Team

Mr. Yosuke Uchiyama	Deputy Director, International corporation department, KDDI foundation

Activity:

- Introduction of this APT J2 Project as starting point
- Possibility of Participation of CRC
  - CRC recommended Mr. Amgalan Zandraa who is in charge of Radio Frequency Regulation and Monitoring in CRC would join our APT J2 project
- Collaboration with Satellite Technology Forum
- Introduction of previous KDDI APT Projects in Asia, Pacific counties
- Current information of fiber backbone network in Mongolia
- Possibility of pilot project for studying regarding access network in future

Date: May 31, 2012

Place : Office of Information, communications technology and Post Authority (ICTPA)
Ulaaanbaatar, Mongolia

Activity: Kickoff meeting of APT J2 Project in Mongolia with Mongolian team and Japanese team

Participant:

Mongolian Team

Dr. Otgonchimeg Buyanjargal (Mrs.)	Director General, Space Technology Department, Information, communications technology and Post Authority (ICTPA)
Ms. Uranchimeg Andrai	Officer Space Technology Department, Information, communications technology and Post Authority (ICTPA)
Ms. Bekhtsetseg Tuvsaanaa	Officer, Public Administration and Cooperation Department, Information, communications technology and Post Authority (ICTPA)
Mr. Batbayar vandansambuu	Officer, Space Technology Department, Information, communications technology and Post Authority (ICTPA)

Japanese Team

Mr. Amgalanbat Batsuren	Laboratory of Spacecraft Environment Interaction Engineering Kyusyu Institute of Technology
Mr. Yosuke Uchiyama	Deputy Director International corporation department KDDI foundation (Accounting manager)

Discussion:

1. Review *refer to Discussion on May 30
   a) Activities of Project of FS and PD for NCRSS
   b) Result of discussion on May 30

2. Participation of new member

As of Mongolian team, due to the budget limitation, it is not necessary to include additional members from other stakeholders into the J2 project. If additional information and other supports required, the ICTPA will handle the issues under the regular procedures.

3. Discussion regarding Proposal from ICTPA for base of next activities

***Refer to Annex 1 attached last page.

a) Main Objective

(1) In view of this APT project different from FS project, Japanese team considered and discussed with MIC Japan. And in APT Tokyo research and study trip, MIC japan will lecture this item in conjunction with our courtesy visit to MIC.

(2) It is already requested that president of KDDI foundation will lecture how to in discussion. However, the lecture of regular/official basic procedure is still looking for by whom in appropriate.

(3) How to make technical documentation using ITU software will be checked in Japan before our APT trip in Japan.

(4) Since ICTPA want to send staffs for practical study rather than lecture with longer period than planned to improve their skill and knowledge, Japanese team will discuss with JAXA and NiCT how to realize this study like on-line job training in Japan. And our APT trip to Japan will be going on some months later after results of the planned trip to Japan by another project.

(5) This item will be discussed in Japanese team.

c) Outcome

(1) This is described in our APT J2 proposal and in general.

4. Conclusion

- Both Mongolian team and Japanese team of APT J2 project begin to start this APT J2 project with above mutual understanding, smoothly and effectively.
- We have equal understanding regarding separate projects between Project of FS & PD for NCRSSL and the APT J2 project. Under this mutual-understanding, we will collaborate with Project of FS & PD for NCRSSL, in order to be achieved the Mongolian objectives by ICTPA.
- The next activity of APT J2 project shall be Tokyo meeting/research/study trip in Japan. This trip will be after the “Satellite Facility Visit” by Project of FS and PD for NCRSSL and will be referred to the result of the “Satellite Facility Visit”.

- The research and study system in ICTPA will be designed by ICTPA based on ICTPA needs for study of Satellite technology and will be checked by Japanese team. The hardware and software will be procured in Mongol in priority.
- Following activities are report (interim and final: activity report by ICTPA in main, accounting report by KDDI foundation) to APT on time, and possibly Japanese team visit in Mongol (future discussion).

Annex 1

PROPOSALS FROM THE ICTPA

Main objective:

To promote a HRD for Space technology in Mongolia is one of a key objectives, which will support to educate high skilled professionals and to transfer knowledge and experience from Japanese satellite experts to Mongolia.

1. To study Japanese Policy and Regulation practices processes on Space technology and its applications.

2. To prepare Human Resources for the coordination procedures with other countries which have their own satellites and planning to launch satellites. To learn how to negotiate with affected administrations for the coordination procedures.

3. In order to organize the coordination procedures, to learn how to prepare the comments and proposals to the ITU using the ITU software such as SpaceCom, SpaceCup etc.

4. To make a Field study and Practice (approx. 1-2 persons for 2-3 weeks, could be partially supported by the JAXA e.g.) at the selected organizations (such as Policy developing organization and Remote sensing satellite Ground station) in order to study policy, regulatory and technical issues for satellite launching, monitoring and its application development. To study how to build HRD capacity and infrastructure development for controlling the satellite.

5. To establish a technical environment with sophisticated software and hardware for simulation satellite network.

Outcomes:

Highlight specifically what has already been done and what is lacking. This task's goal is to complete the response to the question.

A-2. **Satellite Forum**

Refer to the attached part of the brochure of Satellite forum.

A-3. **Material of Research and Study in Japan**

Schedule of Search and Study in Tokyo

19-Feb-13

KDDI foundation

Participant of Mongolian team:

Information Technology, Post and Telecommunications Authority (ITPTA), in Mongolia

Space and Radio communications Division

Director	Dr. Otgonchimeg Buyanjargal
Officer	Ms. Uranchimeg Andrai
Officer	Mr. Batbayar Vandansambuu
Foreign Relations Officer	Ms. Bekhtsetseg Tuvsanaa

Japan

Kyusyu Institute of Technology	Mr. Batsuren Amgalanbat (FEB 26 PM~ 28PM)
KDDI foundation	Mr. Yosuke Uchiyama
	Mr. Junichi Osawa

	DATE	DAY		Activities	Place	Remarks	night
1	FEB. 23	SAT	AM	Flight from Ulaanbaatar KE5866	Flight	ULN 0805 - ICN 1215	
			PM	Flight to Narita KE705	Flight/Shinjuku	ICN 1835 – NRT 2045	
2	FEB. 24	SUN	AM	Spare	Shinjuku		
			PM	Spare	Shinjuku		
3	FEB. 25	MON	AM	ITU Activities(RRB) : Spectrum management	Iidabashi	KDDI foundation:飯田橋	10:00
					(GAT)	(Dr. Ito/RRB)	
			PM	Broadcast satellite service : site visit and discussion	Yokohama	JSAT YSCC:JR横浜線中山駅南口	14:00
					(Nakayama)	By train& taxi	
4	FEB. 26	TUE	AM	(TBD) Orientation and discussion at KDDI foundation	Iidabashi	KDDI foundation:飯田橋	9:30
					(GAT)	By Subway	
			PM	Research satellite : visit and discussion	Sagamihara	JAXA Sagamihara:淵野辺	14:30
					(Fuchinobe)	By train & taxi	
5	FEB. 27	WED	AM	(TBD) Kyusyu Institute of Technology	Iidabashi	KDDI foundation:飯田橋	9:30
					(GAT)	(Mr. Batsuren)	
			PM	New Research Satellite and site tour	Sagamihara	NEC at Sagamihara:橋本	14:00
					(Hashimoto)	By train & taxi	
6	FEB. 28	THU	AM	Courtesy Visit	Kasumigaseki	International Corporation division :霞が関	
				Strategy & policy, Spectrum Assignment in Japan	(MIC)		
			PM	Kashima Space Technology Center	Kashima	NICT:鹿島	14:45/15:10
				(WINS Lab. + Site Tour)	(NICT)	By Bus from Tokyo to Kashima	
7	MAR. 1	FRI	AM	Current status of satellite study report	Onarimon	PADECO	9:30
				(PADECO/Strategic Headquarters for Space Policy/METI)		内閣府、経産省など	
			PM	(TBD) same as above / Discussion and spare	TBD	Conclusion	
8	MAR. 2	SAT	AM	Flight from Narita KE704	Flight	NRT 1335 – ICN 1635	
			PM	Flight to Ulaanbaatar	Flight	ICN 1940 – ULN 2225	

Before this activity in Japan, Kyushu Institute of Technology and KDDI foundation discussed, at Kita-kyushu, how to organize this activity.(One person from KDDI foundation visit at KIT one day of October 18, 2012.

A-4. **Evaluation and final discussion**

Schedule for the final discussion of this J2 project

Schedule for APT J2 Mongolia

Novemver 08, 2013
KDDI foundation

#	Date	Day	Location	Activity	Remarks
1	Nov 24, 2013	SUN	Ulaanbaatar	Flight	
2	Nov 25, 2013	MON	Ulaanbaatar	Discussion(ITPTA) / Procurement	
3	Nov 26, 2013	TUE	Ulaanbaatar	Nana satellite laboratory at National University of Mongolia / Disussion	Mr.Amgalanbat introduces short presentation
4	Nov 27, 2013	WED	Ulaanbaatar	Visit at Meteorogical Office at Ulaambaataar	
5	Nov 28, 2013	THU	Ulaanbaatar	Visit at Naran Earth Station / Discussion	
6	Nov 29, 2013	FRI	Ulaanbaatar	Final Discussion (APT reporting) /Courtesy visit CRC	
7	Nov 30, 2013	SAT	----	Flight	

We had several discussion regarding past activities and final report. And we understand there are people who have interest and study of satellite in Mongolia, as Mongolian students were awarded regarding can-satellite. Therefore, in addition we saved our budget, we decided to support the organization who was contributed to increasing satellite technology in Mongolia, we had classroom of satellite technology in the university, for the preparation of satellite launching we bought the book of ITU, and for the practical preparation and study of satellite technology, we purchased the PCs and install the software.

In visiting in Meteoroidal center and Narran earth station, at the Earth Station we saw rather old equipment were still working well but they need to new and additional equipment for latest and sufficient of traffic, and at Meteoroidal center they, we expect, need to latest technology and more detailed data inside of Mongolia.

A-5. **APT ADF meeting in Bangladesh**

Attached is the presentation material for 10th ADF, (10th Asia Pacific Telecommunication and ICT Development Forum (ADF-10) 20-22 August, 2013, Dhaka, Bangladesh)

A-6. **Transfer List**

At end of this project, we both Mongolian and Japanese team agreed to transfer all equipment and books to Mongolian team (ITPTA). Mongolian team agreed to accept the transfer. Attached following the final accounting report is the transfer list of these equipment.

A-7. **Accounting report**

Attached following this section is the final accounting report in accordance with the completion of APT J2 project of "Study on National Satellite Applications of Mongolia (J2)". Base currency of this accounting report is Japanese yen (with indicating rough estimation of expense by US$).

Total expense is 3,697,947JPY for this project. We were able to reduce the cost of some research items because Mongolian team had another project with Japanese consultant related to launching satellite in parallel. We both projects were not likely to have duplicate activities. Therefore, we focused on rather satellite management activities and support those research and study of small satellite launching.

We had those activities which we proposed on this project application but not including other activities, however, because we had several reasons, we had to execute the activities with delay and postpone the activities.

Also, we found, in Mongolia, people study and research the small satellite system as well as our national size of satellite. Also, we understand more activities are required these frequency assignment and negotiation for satellite as well as getting location.

At our last activity, we decided to procure the book and support the study/research of satellite in Mongolia.

Even then, we save our budget and kept the expense under (lower) approved amount.

See attached the final accounting report in detailed.