

**Mongolia**

**Ministry of Road and Transport Development (MRTD)**

**The Project for Human Resource  
Development and  
O&M Capacity Development for  
New Ulaanbaatar International Airport  
(NUBIA)**

**Project Completion Report**

**October 2021**

**Japan International Cooperation Agency  
Japan Radio Air Navigation Systems Association  
Air Traffic Control Association, Japan**

I M
J R
21-059

# **Project Completion Report**

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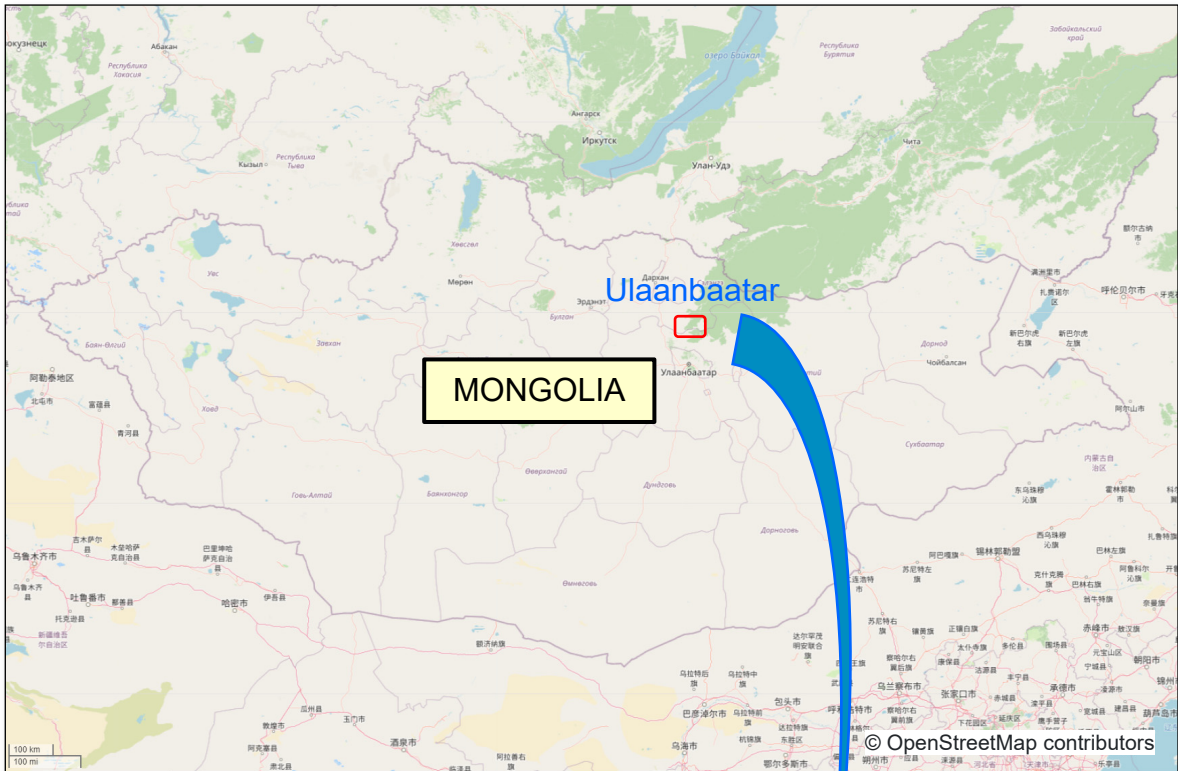
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## Abbreviations

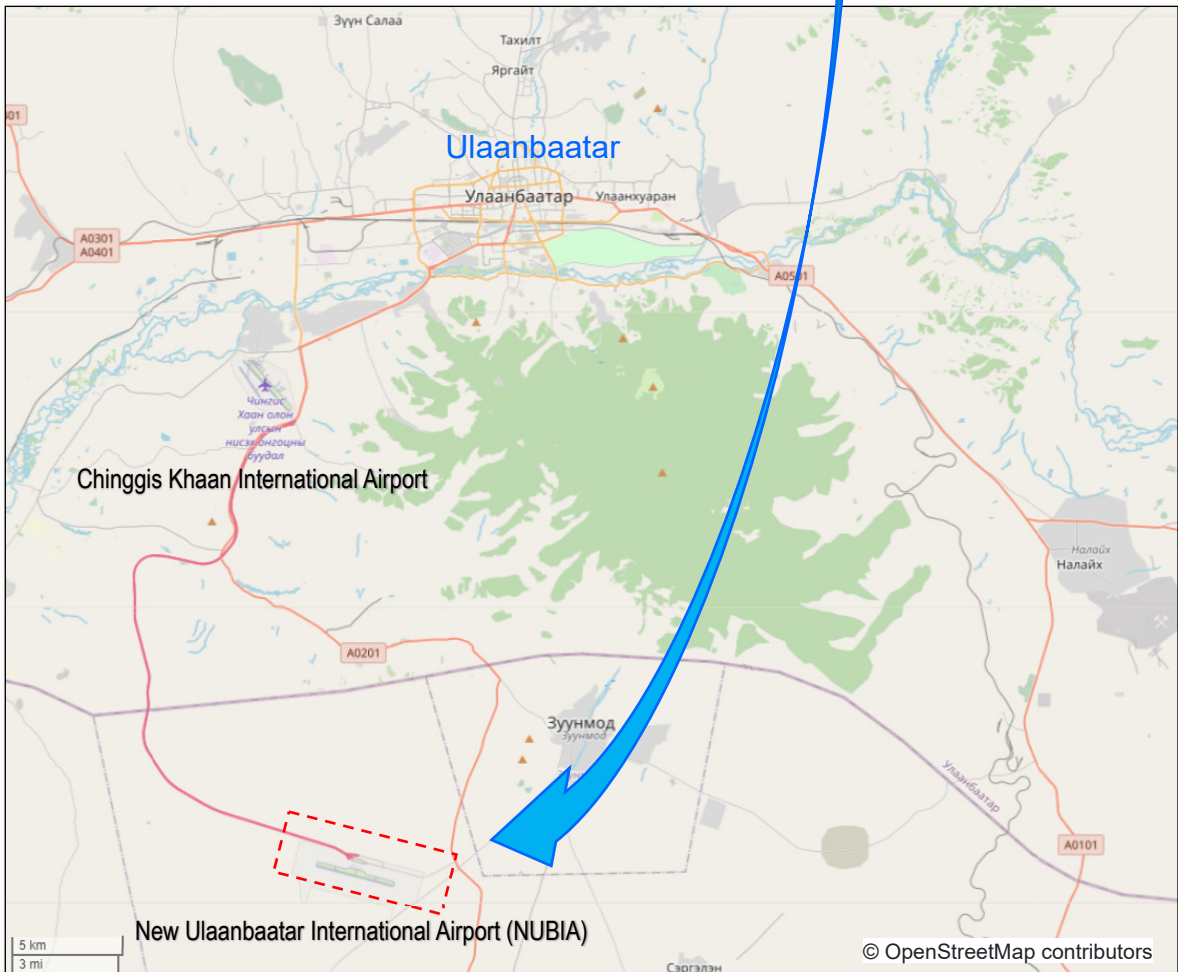
Acronym	Standard Nomenclature
AFL	Airfield Light
AIP	Aeronautical Information Publication
AIS	Aeronautical Information Services
ANS	Air Navigation Services
ATC	Air Traffic Control
ATCAJ	Air Traffic Control Association, Japan
ATM	Air Traffic Management
CAAM	Civil Aviation Authority of Mongolia
CKIA	Chinggis Khaan International Airport
CNS	Communications, Navigation and Surveillance
C/P, CP	Counterpart
CS	Customer Satisfaction
DAC	Development Assistance Committee
DME	Distance Measuring Equipment
FI	Flight Inspection
FPD	Flight Procedure Design
FV	Flight Validation
IATA	International Air Transport Association
ICAO	International Civil Aviation Organization
ILS	Instrument Landing System
JALUX	JALUX Inc.
JAT	Japan Airport Terminal Co., Ltd.
JCAB	Japan Civil Aviation Bureau
JCM (JCC)	Joint Coordination Meeting (Joint Coordination Committee)
JICA	Japan International Cooperation Agency
JRANSA	Japan Radio Air Navigation Systems Association
LLC	Limited Liability Company
LOI	Local Operation Instruction
MLAT	Multi-lateration
MLIT	Ministry of Land, Infrastructure, Transport and Tourism
MRTD	Ministry of Road and Transport Development of Mongolia
MS	Monitoring Sheet
NAA	Narita International Airport Corporation
NCAC	National Civil Aviation Center
NSO	National Statistics Office
NUBIA	New Ulaanbaatar International Airport
O&M	Operation and Maintenance
ODA	Official Development Assistance
OECD	Organization for Economic Co-operation and Development
OJT	On the Job Training
ORAT	Operational Readiness and Airport Transfer
PBN	Performance Based Navigation
PC	Personal Computer
PCR	Project Completion Report
PDM	Project Design Matrix
PIU	Project Implementation Unit (for the NUBIA construction project)
PO	Plan of Operation
POA	Pre-Operation Administration

RCAT	Readiness check and Transfer
R/D, RD	Record of Discussions
SPC	Special Purpose Company
VOR	VHF Omni-directional Radio Range
WG	Working Group

# Project Location Maps



(Nationwide)



(Ulaanbaatar City and NUBIA)



## Photos



Source: JICA Mongolia Facebook

New Ulaanbaatar International Airport (NUBIA)



Source: JICA Mongolia Facebook

New Ulaanbaatar International Airport (NUBIA)



Source: JICA Mongolia Facebook

New Ulaanbaatar International Airport (NUBIA)





ANS WG and JICA experts (ANS)



NUBIA facilities survey by JICA experts



Workshop (ANS project)



Safety assessment task force meeting



Workshop (CNS)



Workshop (AFL/Electrical)



Workshop (Flight inspection)



Flight procedure design training at CAAM





ANS training at Chubu international airport in Japan



Flight inspection training at flight inspection Center in Japan

AFL/Electrical training at Narita international airport



Emergency operation training (RCAT) by CAAM and NUBIA LLC



Flight validation by CAAM, MIAT, JICA experts

Flight inspection by CAAM flight inspectors

# **I. BASIC INFORMATION OF THE PROJECT**

## **1. Country**

Mongolia

## **2. Title of the Project**

The Project for Human Resource Development and O&M Capacity Development for New Ulaanbaatar International Airport (NUBIA)

## **3. Duration of the Project**

Planned: December 2014 to July 2017 (32 months), with target airport opening in May 2017  
Actual: January 2015 to September 2021 (80 months) with actual airport opening on 4 July 2021

The initial target date of opening of NUBIA was May 2017. However, the new airport opening was delayed by four years due to delayed construction of airport facilities, delayed establishment of NUBIA operator and outbreak of Covid-19 pandemic. As a result, the duration of the Project was extended also by four years.

## **4. Background**

Chinggis Khaan International Airport has been recently seeing rapid growth in passenger demand with the increase from 0.46 million passengers in 2006 to one (1) million in 2012. In order to respond to this increase, a Japanese ODA loan agreement was signed in 2008 to provide a loan for assistance for the Project for Construction of New Ulaanbaatar International Airport (NUBIA), which was completed in April 2020. However, human resource and systems urgently need to be developed for smooth operation and maintenance of NUBIA.

National Policy for Civil Aviation Sector Development until 2020 which was approved by the Mongolian Parliament in February, 2013 sets the provision of economic as well as competitive civil aviation services with international- standard flight services, high level of security and safety, as one of the priority issues for national economic and social development. The policy describes the new airport to be developed as a hub airport of passengers and air cargo in North-eastern Asia.

Both Japanese ODA Policy for Mongolia as well as JICA Country Analysis Paper on Mongolia set “strengthening of city function of Ulaanbaatar” as one of the priority issues, and the construction of NUBIA is in line with it. “Erch Initiative” which was agreed on March 30, 2013, between the Prime Minister of Mongolia and the Prime Minister of Japan to facilitate cooperation for development of investment / business environment and Mongolia’s sustainable economic development, mentioned the construction of NUBIA and improvement of convenience through it. The medium term program for strategic partnership between Japan and Mongolia (2013-2017), which was issued as a joint communique on September 13, 2013, also emphasized the importance of the cooperation between the governments of Japan and Mongolia for upgrading capacity on O&M of airport-related facilities. It is considered, therefore, the Project is highly consistent to the policy of GOM and GOJ.

## **5. Overall Goal and Project Purpose**

### **5-1 Overall Goal**



NUBIA, the capital airport of Mongolia, is upgraded in its capacity to be able to function appropriately in case of rapid increase of customers as the gateway of the country.

## 5-2 Project Purpose

Mechanism as well as capacity for O&M are strengthened in NUBIA for its smooth inauguration.

## 6. Implementing Agency

Ministry of Road and Transport Development (MRTD) and  
Civil Aviation Authority of Mongolia (CAAM)

## II. RESULTS OF THE PROJECT

### 1. Inputs and Activities

#### 1-1 Inputs by the Japanese Side

##### a) Total Cost

Planned: 350 million Yen

Actual: 589 million Yen

##### b) JICA Experts

Inputs of JICA Experts, planned and actual, are indicated in Table 1-1.1.

Table 1-1.1 Inputs of JICA Experts (Assigned Man-Months in Mongolia and Japan)

Position/Technical Field	Planned	Actual
Long-term Experts	64.00	100.14
- Chief Advisor	32.00	41.57
- Airport Relocation/Project Coordinator		3.67
- Project Coordinator	32.00	54.90
Short-term Experts (Airport)	73.95	66.96
- Project Manager/Airport Relocation/ Civil Engineer/Snow Removal (1)	3.92	5.90
- Deputy Project Manager/Terminal Facilities/Communication Facilities (1)/Information Technology (1)	2.08	4.78
- Ground Handling Service/Cargo (1)	1.70	4.10
- Ground Handling Service/Cargo (2)	2.00	
- Cargo (1)	1.70	3.61
- Cargo (2)	2.00	
- Security (1)	0.95	2.53
- Security (2)	1.90	
- Airport Operation/Safety (1)	1.65	2.81
- Airport Operation/Safety (2)	1.80	
- Airport Planning/Organization/Human Resource	1.80	1.80
- Civil Engineer/Snow Removal (1)	2.35	
- Civil Engineer/Snow Removal (2)	1.30	1.30
- Special Equipment (1)	2.35	2.35
- Special Equipment (2)	1.30	1.30
- Machinery Facilities (1)	2.50	2.85
- Machinery Facilities (2)	1.30	1.30
- Electrical Equipment (1)	2.50	2.50

- Electrical Equipment (2)	1.30	1.30
- Communication Facilities (1)	2.35	
- Communication Facilities (2)	1.30	1.30
- Information Technology (1)	1.60	
- Information Technology (2)	0.70	0.70
- Fuel Supervision (Safety Management)	1.80	3.45
- Fuel Business Management	2.35	
- Fuel Facility Management	5.30	3.25
- Fuel Operations and Maintenance	4.05	2.92
- Fuel Wing Service	4.05	2.18
- Tenant Management	3.90	3.95
- Charge Setting/Income and Expenditure Planning	1.80	1.95
- Customer Service Improvement (1)	2.50	2.20
- Customer Service Improvement (2)		0.78
- Monitoring Evaluation (1)	3.45	2.25
- Monitoring Evaluation (2)		1.20
- Training in Japan	2.40	2.40
<b>Short-term Experts (ANS)</b>	<b>20.01</b>	<b>45.41</b>
- ANS Chief Advisor/Pre-operation Planner	4.10	9.75
- ANS Sub-Chief Advisor/ATC Training Expert	3.62	8.47
- CNS Training Expert (1)	2.90	7.43
- CNS Training Expert (2)	1.50	4.53
- Flight Training Expert	1.97	5.47
- Flight Procedure Design Expert (1)	4.05	6.88
- Flight Procedure Design Expert (2)	0.80	1.63
- Procurement Supporter for FPD Training System	0.47	0.55
- Monitoring Expert	0.60	0.70
<b>Total</b>	<b>157.96</b>	<b>212.51</b>

c) Training in Japan

Training in Japan, planned and actual, are indicated in Table 1-1.2.

Table 1-1.2 Training in Japan

Training	Planned	Actual
<b>Airport Training</b>	<b>1,134 person days</b>	<b>1,053 person days</b>
- Airport Management (Airport Planning/Organization/Human Resource)	8 persons, 14 days (1 time)	9 persons, 7 days
- Airport Operation (Ground Handling/Cargo)	6 persons, 7 days (2 times)	4 persons, 7 days 6 persons, 7 days
- Airport Management (Airport Facilities)	6 persons, 7 days (1 time)	5 persons, 7 days
- Operation and Maintenance of Airport Facilities	12 persons, 14 days (2 times)	12 persons, 14 days (2times) 7 persons, 9 days (2 times)
- Aviation Fuel Facility (Management)	2 persons, 14 days (1 time)	3 persons, 14 days
- Aviation Fuel Facility (Business Management)	4 persons, 14 days (1 time)	
- Aviation Fuel Facility (Operation and Maintenance)	4 persons, 14 days (2 times)	3 persons, 12 days (2 times)
- Aviation Fuel Facility (Wing Service)	3 persons, 14 days (2 times)	3 persons, 12 days
- Tenant Management/Charge Setting/ Income and Expenditure Planning	6 persons, 14 days (2 times)	6 persons, 14 days (2 times)
- Customer Satisfaction Improvement	4 persons, 14 days (2 times)	5 persons, 14 days (2 times)

<b>ANS Training</b>	<b>70- 140 person days</b>	<b>232 person days</b>
- Coordination between Airport and ANS, Planning of ANS Preparation, Ground Control with MLAT, Maintenance of ANS Facilities, Flight Inspection and Validation	10 persons, 7 - 14 days (1 time)	13 persons, 7 days (ANS Preparation) 4 persons, 14 days (Flight Inspection) 5 persons, 10 days (CNS) 5 persons, 7 days (ATC)
<b>Total</b>	<b>1,204-1,274 person days</b>	<b>1,285 person days</b>

d) Training Equipment

Automated Flight Procedure Design System (from August 2016 to March 2018)

Cost: 10.0 million Yen

e) Overseas Activities Cost

Year	2014	2015	2016	2017	2018	2019	2020	2021	Total
Cost (million Yen)	1.1	9.9	6.0	6.0	6.6	4.0	1.6	1.0	36.1

## 1-2 Inputs by the Mongolian Side

a) Assignment of Counterparts

Assignment of the counterpart when the new airport was opened in July 2021 is indicated as follows:

- Project Director, Head of Steering Committee for O&M (Chairperson of JCM)
- Project Manager, Deputy Director General CAAM
- Relocation Countermeasure Headquarters
- National Civil Aviation Center, CAAM
- NUBIA LLC (NUBIA Operator)

At the beginning of the Project, Pre-Operation Administration (POA) of CAAM, an organization preparing for operation and maintenance of NUBIA was the major counterpart of transfer of knowledge and technique by JICA experts. After NUBIA LLC, operating company of NUBIA, was established in July 2019, staff of POA as well as those of the former International Airport was progressively transferred to NUBIA LLC. The human resource development for the inauguration of NUBIA thereafter was continued as internal training of NUBIA LLC.

Regarding the Air Navigation Services (ANS), the ANS WG was established at the beginning of the project, and the project was promoted in cooperation with the ANS WG members and the JICA expert team. However, from May 2019, ANS WG has been shrunk as it achieved its purpose, and a person was appointed as the coordinator with the JICA expert team and JICA Experts have continued to support CAAM through this coordinator.

On the other hand, in February 2020, CAAM was reorganized to separate regulator departments and operations departments, and NCAC was established as the operations department. The counterparts were under the jurisdiction of NCAC.

b) Project Office

CAAM provided the project office and facilities for JICA experts at CAAM Headquarters and NUBIA.

c) Local Cost

CAAM provided cost for office space/facilities for JICA experts.

### 1-3 Activities

a) Activities related to Output 1 (Establishment of O&M Organization)

There were four activities related to Output 1. All activities under Output 1 has been completed with four years of delay.

Activities		Planned	Progress (Jan 2017) MS ver 2	Progress (July 2019) MS ver 5	Results (Aug 2021) PCR
1-1	Review the present situation of O&M at Chinggis Khaan International Airport	Completed by end March 2015	100%	100%	100%
1-2	Learn the O&M mechanism as well as activities taken in Japanese airport(s) with some field visits	Completed by end August 2015	80%	100%	100%
1-3	Implement Action Plan for establishing O&M organization at NUBIA (including staff allocation)	Completed by end April 2017	40%	70%	100%
1-4	Conduct training on airport operation	Completed by end July 2017	0%	70%	100%

According to the hearing from the NUBIA LLC and Mongolian counterparts, the establishment of O&M organization was successfully completed without any specific problem.

b) Activities related to Output 2 (Maintenance of Runway and Other Facilities)

There were four activities related to Output 2. All activities under Output 2 has been completed with four years of delay.

Activities		Planned	Progress (Jan 2017) MS ver 2	Progress (July 2019) MS ver 5	Results (Aug 2021) PCR
2-1	Review the present situation of maintenance of runway, etc. at Chinggis Khaan International Airport	Completed by end March 2015	80%	100%	100%
2-2	Learn the mechanism as well as activities taken in Japanese airport(s) in the field of maintenance of runway, etc. with some field visits.	Completed by end August 2015	80%	100%	100%
2-3	Implement Action Plan for maintenance of runway, etc. at NUBIA	Completed by end April 2017	50%	85%	100%
2-4	Conduct training in some priority fields in maintenance of runways, etc.	Completed by end July 2017	0%	100%	100%

According to the hearing from the NUBIA LLC, the training program in Narita Airport was effective because the trainees could practically learn the way of maintenance of runway and other facilities in Japan.

c) Activities related to Output 3 (Operation and Maintenance of Fuel Supply System)

There were four activities related to Output 3. All activities under Output 3 have been completed with four years of delay.

	Activities	Planned	Progress (Jan 2017) MS ver 2	Progress (July 2019) MS ver 5	Results (Aug 2021) PCR
3-1	Review the present situation of O&M of fuel supply system at Chinggis Khaan International Airport	Completed by end March 2015	100%	100%	100%
3-2	Learn the O&M mechanism as well as activities taken in Japanese airport(s) in the field of fuel supply system with some field visits	Completed by end August 2015	50%	100%	100%
3-3	Implement Action Plan for O&M in the field of fuel supply system at NUBIA	Completed by end April 2017	36%	87%	100%
3-4	Conduct training in some priority fields in O&M of fuel supply system	Completed by end July 2017	0%	85%	100%

Although the output 3 has been completed, most of the employees who had fuel supply system training from the project have been transferred to NUBIA LLC or quit their jobs so that there are only a few employees in the field of fuel supply system who had training from the project. Therefore, solution for the capacity development in the field of fuel supply system should be considered as soon as possible.

d) Activities related to Output 4 (Charge Setting and Tenant Management)

There were five activities related to Output 4. All activities under Output 4 have been completed with four years of delays.

	Activities	Planned	Progress (Jan 2017) MS ver 2	Progress (July 2019) MS ver 5	Results (Aug 2021) PCR
4-1	Review the present situation of operation as well as profitability of Chinggis Khaan International Airport	Completed by end March 2015	100%	100%	100%
4-2	Learn the charge setting methods as well as tenant management taken in Japanese airport(s) with some field visits.	Completed by end August 2015	100%	100%	100%
4-3	Implement Action Plan for charge setting at NUBIA	Completed by end April 2017	43%	80%	100%
4-4	Implement Action Plan for tenant management at NUBIA	Completed by end July 2017	31%	100%	100%
4-5	Conduct training on tenant management	Completed by end July 2017	0%	100%	100%

Although the Output has been completed and the new international airport's operation has been started, some tenants have not opened their shop or restaurants due to the COVID-19 pandemic.

e) Activities related to Output 5 (Improvement of Customer Satisfaction)

There were four actives related to Output 5. All activities under Output 5 has been completed with four years of delay.

Activities		Planned	Progress (Jan 2017) MS ver 2	Progress (July 2019) MS ver 5	Results (Aug 2021) PCR
5-1	Review the present situation of customer services at Chinggis Khaan International Airport	Completed by end March 2015	100%	100%	100%
5-2	Learn the mechanism as well as activities taken in Japanese airport(s) in the field of customer satisfaction (CS) improvement with some field visits	Completed by end August 2015	100%	100%	100%
5-3	Implement Action Plan for customer satisfaction (CS) improvement	Completed by end April 2017	48%	84%	100%
5-4	Conduct training on customer satisfaction (CS) improvement	Completed by end July 2017	0%	100%	100%

Due to the COVID-19 pandemic, the number of international flights have been limited since the opening of the NUBIA. Therefore, there have not been many customers compared with usual time and there have not been any specific problem so far.

f) Activities related to Output 6 (Airport Relocation Plan)

There were four actives related to Output 6. All activities under Output 6 has been completed with four years of delay.

Activities		Planned	Progress (Jan 2017) MS ver 2	Progress (July 2019) MS ver 5	Results (Aug 2021) PCR
6-1	Review the procedures as well as the progress of preparation for startup and commissioning of NUBIA	Completed by end March 2015	100%	100%	100%
6-2	Learn the method as well as the activities taken in Japanese airport(s) in the field of airport relocation	Completed by end August 2015	100%	100%	100%
6-3	Implement Action Plan for airport relocation to NUBIA	Completed by end April 2017	47%	47%	100%
6-4	Provide overall coordination of airport relocation among related entities.	-	0%	0%	100%

Since there was no international flight on the date before the opening of the new international airport, the actual operation of relocation was completed smoothly. Also, the relocation working group meeting had been held 8 times and it made the relocation coordination efficient.

g) Activities related to Output 7 (ANS Capacity Development and Relocation Plan)

There were 26 actives related to Output 7. All activities under Output 7 has been completed with four years of delays.

Activities		Planned	Progress (Dec 2016) MS ver 2	Progress (Jun 2019) MS ver 6	Results (Aug 2021) PCR
7-1	Pre-operation Plan				
7-1-1	Develop a draft Pre-operation Plan	Completed by end June 2016	100%	100%	100%
7-1-2	Learn practices of airport/ANS coordination in Japan (including training in Japan)	Completed by end July 2016	50%	60%	100%
7-1-3	Improve the Pre-operation Plan based on analysis on the draft	Completed by end October 2016	100%	100%	100%
7-1-4	Monitor progress of the Pre-operation Plan, and adjust if necessary	Completed by end April 2017	50%	50%	100%
7-2	Opening Day Plan				
7-2-1	Develop an Opening Day Plan	Completed by end April 2017	0%	15%	100%
7-2-2	Monitor progress of the Opening Day Plan, and adjust if necessary	Completed by end April 2017	0%	0%	100%
7-3	Safety Assessment				
7-3-1	Assess risk and occurrence of unsafe events associated with new services	Completed by end April 2017	50%	70%	100%
7-3-2	Develop safety measures for critical safety issues	Completed by end April 2017	50%	70%	100%
7-4	Training of ATC officers				
7-4-1	Develop training program for ATC officers	Completed by end July 2016	50%	80%	100%
7-4-2	Develop ATC Operation Procedures	Completed by end September 2016	75%	75%	100%
7-4-3	Conduct training on ATC Operation Procedures	Completed by end November 2016	0%	80%	100%
7-4-4	Conduct simulator and test-operation training	Completed by end April 2017	0%	80%	100%
7-4-5	Develop Rating Standard	Completed by end March 2017	50%	100%	100%
7-4-6	Implement rating of ATC officers	Completed by end April 2017	50%	75%	100%
7-5	Training of CNS engineers				
7-5-1	Develop training program for CNS engineers	Completed by end July 2016	50%	80%	100%
7-5-2	Develop CNS Maintenance Procedures	Completed by end December 2016	25%	70%	100%
7-5-3	Conduct training on CNS Maintenance Procedures	Completed by end February 2017	50%	70%	100%
7-5-4	Conduct On-the-Job Training of CNS engineers	Completed by end April 2017	0%	70%	100%
7-5-5	Develop Tentative CNS Maintenance Procedures	-	-	100%	100%
7-5-6	Implement Tentative CNS Maintenance at NUBIA	-	-	70%	100%
7-6	Training of Flight Inspection engineers				
7-6-1	Develop flight inspection procedures	Completed by end October 2016	75%	100%	100%

7-6-2	Conduct On-the-Job Training of Flight Inspection engineers	Completed by end April 2017	25%	95%	100%
7-7	Development of Flight Procedures for NUBIA				
7-7-1	Design instrument flight procedures (IFPs)	Completed by end October 2016	90%	100%	100%
7-7-2	Conduct ground validation	Completed by end November 2016	75%	100%	100%
7-7-3	Conduct flight calibration/validation	Completed by end December 2016	0%	90%	100%
7-7-4	Production of aeronautical charts for AIP	Completed by end February 2017	90%	90%	100%

Due to the COVID-19 pandemic from 2020, it became difficult to go to Mongolia, the JICA experts have provided remote support from Japan via periodic Web meetings with counterparts for gathering and sharing preparation status, issues, etc. At the emergency training, RCAT, opening day operations (including the day before opening day and the day after opening day), JICA experts assigned some local staff in NUBIA for monitoring operations in real-time and provided advice to the counterparts.

## 2. Achievement of the Project

### 2-1 Outputs and Indicators

- a) Achievement of Output 1 (O&M organization is established based on O&M organization plan including staff allocation.)

Output 1 has been achieved at the end of the Project with all indicators under Output 1 achieved.

Indicator for Output		Progress (Jan 2017) MS ver 2	Progress (July 2019) MS ver 5	Results (Aug 2021) PCR
1-1	C/Ps' knowledge on O&M organization is increased.	0%	0%	100%
1-2	Regulations, manual, etc. for O&M organization at NUBIA are prepared.	46%	100%	100%
1-3	Organizational chart is prepared for NUBIA.	50%	50%	100%
1-4	Staff are allocated and meet the quota	0%	0%	100%

- b) Achievement of Output 2 (Implementation capacity for revised maintenance plan of runways etc. at NUBIA is improved.)

Output 2 has been achieved at the end of the Project with all indicators under Output 2 achieved.

Indicator for Output		Progress (Jan 2017) MS ver 2	Progress (July 2019) MS ver 5	Results (Aug 2021) PCR
2-1	C/Ps' knowledge on maintenance of runway, etc. is increased.	0%	0%	100%
2-2	Regulations, manual, etc. for maintenance of runway, etc. at NUBIA are prepared.	36%	100%	100%
2-3	Maintenance plan of runway, etc. at NUBIA is documented.	0%	100%	100%
2-4	Staff are well educated on maintenance of runway, etc.	0%	0%	100%

- c) Achievement of Output 3 (Implementation capacity for newly developed O&M plan of fuel supply at NUBIA is improved.)



Output 3 has been achieved at the end of the Project with all indicators under Output 3 achieved.

Indicator for Output		Progress (Jan 2017) MS ver 2	Progress (July 2019) MS ver 5	Results (Aug 2021) PCR
3-1	C/Ps' knowledge on O&M of fuel supply system is increased.	0%	0%	100%
3-2	Regulations, manual, etc. for O&M of fuel supply system at NUBIA are prepared.	36%	94%	100%
3-3	O&M plan for O&M of fuel supply system at NUBIA is documented.	0%	94%	100%
3-4	Staff are well educated on O&M of fuel supply system	0%	0%	100%

- d) Achievement of Output 4 (Implementation capacity for newly established charge setting system and tenant management plan at NUBIA is improved.)

Output 4 has been achieved at the end of the Project with all indicators under Output 4 achieved.

Indicator for Output		Progress (Jan 2017) MS ver 2	Progress (July 2019) MS ver 5	Results (Aug 2021) PCR
4-1	C/Ps' knowledge on charge setting methods and tenant management is increased.	0%	0%	100%
4-2	Appropriate charge system is installed at NUBIA.	43%	43%	100%
4-3	Regulations, Manual, etc. for tenant management at NUBIA are prepared.	31%	70%	100%

- e) Achievement of Output 5 (Implementation capacity for newly developed customer satisfaction (CS) plan for upgrading CS at NUBIA is improved.)

Output 5 has been achieved at the end of the Project with all indicators under Output 5 achieved.

Indicator for Output		Progress (Jan 2017) MS ver 2	Progress (July 2019) MS ver 5	Results (Aug 2021) PCR
5-1	C/Ps' knowledge on CS is increased.	0%	100%	100%
5-2	Regulations, manual, activities for upgrading customer satisfaction (CS) at NUBIA are prepared.	48%	48%	100%
5-3	Staff are well educated on CS improvement	0%	0%	100%

- f) Achievement of Output 6 (Airport Relocation Plan)

Output 6 has been achieved at the end of the Project with all indicators under Output 6 achieved.

Indicator for Output		Progress (Jan 2017) MS ver 2	Interim (July 2019) MS ver 5	Results (Aug 2021) PCR
6-1	C/Ps have deepened their understanding on necessary activities for preparation for airport relocation.	0%	0%	100%
6-2	Staff and other necessary resources are appropriately allocated for airport relocation.	0%	0%	100%

- g) Achievement of Output 7 (Capacity of CAAM is developed for provision of Air Navigation Services at NUBIA.)

Output 7 has been achieved at the end of the Project with all indicators under Output 7 achieved.

Indicator for Output		Progress (Dec 2016) MS ver 2	Progress (Jun 2019) MS ver 6	Results (Aug 2021) PCR
7-1	Pre-operation Plan is developed, implemented and monitored.	75%	75%	100%
7-2	Opening Day Plan is developed, implemented and monitored	0%	15%	100%
7-3	Safety assessment by CAAM inspectors is completed for ATM and CNS.	50%	70%	100%
7-4	At least 32 officers are rated for ATC at NUBIA.	0%	50%	100%
7-5	At least 25 engineers are capable of maintaining CNS systems at NUBIA.	50%	90%	100%
7-6	At least 6 engineers are capable of conducting flight inspection of IFPs.	75%	95%	100%
7-7	Conventional IFPs for NUBIA are issued in AIP.	75%	95%	100%
7-8	PBN IFPs for NUBIA are issued in AIP.	75%	85%	100%

## 2-2 Project Purpose and Indicators

The Project Purpose is “Mechanism as well as capacity for O&M are strengthened in NUBIA for its smooth inauguration”. The Project Purpose is evaluated as fully achieved with all seven indicators achieved as indicated below:

Indicator for Project Purpose		Evacuation at the Project Completion
1	O&M organization of NUBIA is established and starts functioning.	Fully achieved: Operation of NUBIA started on 4 July 2021 with NUBIA LLC as O&M organization.
2	Preparatory work in the field of maintenance of runway, etc. along with the revised maintenance plan for NUBIA.	Fully achieved: Preparatory work in the field of maintenance of runway etc. has been completed, and NUBIA started operation on 4 July 2021.
3	Preparatory work in the field of fuel supply system along with O&M plan for NUBIA.	Fully achieved: Preparatory work in the field of fuel supply system has been completed, and NUBIA started operation on 4 July 2021.
4	Preparatory work in the field of tenant management for NUBIA along with the O&M plan for NUBIA including appropriate charges.	Fully achieved: Preparatory work in the field of tenant management has been completed, and NUBIA started operation on 4 July 2021.
5	Preparatory work in the field of customer satisfaction (CS) improvement along with the O&M plan for NUBIA.	Fully achieved: Preparatory work in the field of customer satisfaction has been completed, and NUBIA started operation on 4 July 2021.
6	Preparatory work for relocation to NUBIA.	Fully achieved: Preparatory work for relocation to NUBIA has been completed, and airport relocation was implemented for NUBIA opening on 4 July 2021.
7	Preparatory work for provision of Air Navigation Services at NUBIA is completed in accordance with Pre-operation Plan	Fully achieved: Preparatory work for Air Navigation Services at NUBIA has been completed, and NUBIA started operation on 4 July 2021.

## 3. History of PDM Modification

The PDM of the Project was modified six times by the completion of the Project. The outline of the modifications is indicated below:

Amendment No.	Modification of PDM and Amendment of R/D
First Amendment, 22 April 2016	<ul style="list-style-type: none"> <li>• Output and Activities related to capacity development for provision of ANS at NUBIA was added.</li> <li>• Input by the Japanese side (Japanese Experts, Training in Japan and Equipment) was added in response to addition of capacity development for provision of ANS at NUBIA.</li> <li>• Input by the Mongolian side (Counterpart, Equipment) was added in response to addition of capacity development for provision of ANS at NUBIA.</li> <li>• Project Purpose and Output indicators was added in response to addition of capacity development for provision of ANS at NUBIA.</li> <li>• Activities related to capacity development for airport services were rephrased.</li> </ul>
Second Amendment, 7 April 2017	<ul style="list-style-type: none"> <li>• Implementation structure of the Mongolian side was updated.</li> <li>• Duration of the Project was extended from 32 months to 42 months (until July 2018) due to delay of NUBIA opening.</li> <li>• Activities related to tentative maintenance of CNS were added.</li> <li>• Training in Japan in the field of ANS were detailed.</li> </ul>
Third Amendment 5 June 2018	<ul style="list-style-type: none"> <li>• Duration of the Project was extended from 42 months to 54 months (until July 2019) due to delay of NUBIA opening.</li> <li>• Activity related to overall coordination of airport relocation was added.</li> <li>• ATC Training Simulator as input of the Mongolian side was changed to ATC simulator training abroad</li> <li>• NUBIA Operator and FSS Operator were added as input from the Mongolian side.</li> </ul>
Fourth Amendment 9 July 2019	<ul style="list-style-type: none"> <li>• Duration of the Project was extended from 54 months to 68 months (until September 2020) due to delay of NUBIA opening.</li> </ul>
Fifth Amendment 24 August 2020	<ul style="list-style-type: none"> <li>• Duration of the Project was extended from 68 months to 71 months (until December 2020) due to delay of NUBIA opening.</li> </ul>
Sixth Amendment 23 December 2020	<ul style="list-style-type: none"> <li>• Duration of the Project was extended from 71 months to 80 months (until September 2021) due to delay of NUBIA opening.</li> </ul>

### III. RESULTS OF JOINT REVIEW

#### 1. Results of Review based on DAC Evaluation Criteria

##### 1-1 Relevance

###### Relevance of the Project is high

- This purpose of the Project is “Mechanism as well as capacity for O&M is strengthened in NUBIA for its smooth inauguration.” This Project Purpose was consistent with “National Policy on Civil Aviation in Mongolia up to the year 2020”, which emphasized importance of human resource development of civil aviation services. This policy was maintained through the Project period.
- The Project Purpose is consistent with JICA’s cooperation strategy that includes “Balanced economic development” as well as “High quality infrastructure that support economic growth”.
- The Project Purpose is consistent with the need that NUBIA is operated with O&M organization with capable human resources.
- NUBIA facilities were developed with JICA loan. It was appropriate to enhance human resource development for operation of NUBIA, which makes synergy effect with NUBIA facility.

##### 1-2 Effectiveness (achievement of Project Purpose)

###### Effectiveness of the Project is high.

- Seven outputs of the Project were achieved with all relevant indicators fully achieved by the completion of the Project.

- Achievement of the outputs has strong linkage with the achievement of the Project Purpose.
- The Project Purpose was achieved with all seven indicators fully achieved at the completion of the Project.

### 1-3 Efficiency

Efficiency of the Project is low.

- The opening of NUBIA was delayed by four years due to delayed construction of airport facilities, delayed establishment of NUBIA operator and outbreak of Covid-19 pandemic. As a result, the duration of the Project was extended from 32 months to 80 months.
- The cost of the Project by JICA was increased significantly from the initial budget of Yen 350 million to Yen 589 million, due to delayed construction of airport facilities, delayed establishment of NUBIA operator and outbreak of Covid-19 pandemic.

### 1-4 Impact

Impact of the Project is expected to be high.

- The overall goal of the Project is “NUBIA, capital airport of Mongolia, is upgraded in its capacity to be able to function appropriately in case of rapid increase of customers as the gateway of the country”. This overall goal has been partially achieved and is expected to be fully achieved in a few years.
- There is a linkage between achievement of the Project Purpose and the achievement of the overall goal.
- The development and operation of NUBIA will enhance economic development of Mongolia through investment, trade and tourism development.

### 1-5 Sustainability

Sustainability of the Project is expected to be high.

[Policy]

- Sustainable operation of NUBIA will remain as a priority in National Civil Aviation policy.

[Organization]

- NUBIA LLC is adequately organized to sustainably operate NUBIA with the Japanese style management.
- Air Navigation Services Department of CAAM is adequately organized to sustainably provide ANS at NUBIA.
- Ground Handling and Fuel Supply Services of CAAM is adequately organized to sustainably operate FSS at NUBIA.

[Capacity]

- NUBIA LLC is technically capable of sustainable operation of NUBIA.
- Air Navigation Services Department of CAAM is technically capable of sustainably provision of ANS at NUBIA.
- Ground Handling and Fuel Supply Services of CAAM is technically capable of sustainably operate FSS at NUBIA with continued training of staff.

[Finance]

- NUBIA LLC is financially sustainable as it is commercially managed with user charges. However, the COVID-19 pandemic negatively affect aviation industry all over the world so that there should be some solution to cover this negative effect in the long run.
- ANS and FSS at NUBIA are financially sustainable since CAAM provide these services with user charges.

## **2. Key Factors Affecting Implementation and Outcomes**

### **2-1 Desirable Effects**

- a) Personnel with practical experience mobilized as short-term experts

The short-term experts assigned for this Project had practical experience in their technical field such as ground handling service, tenant management, fuel supply system, customer service and so on. Many counterparts recognized the depth of practical knowledge of the experts and felt that they could answer just about any question at all.

- b) Addition of capacity development for provision of ANS at NUBIA

The Project added the capacity development for provision of ANS at NUBIA with the first amendment of the RD dated on 22 April 2016. With this addition, preparatory work of ANS and relocation of ANS functions from the former Ulaanbaatar Airport to NUBIA was implemented effectively and smoothly.

- c) CAAM's positive role for airport relocation coordination

Although JICA could not assign an expert on Airport Relocation after April 2020 because of the COVID-19 pandemic, CAAM established Relocation Countermeasure Headquarters and carefully coordinated with related stakeholders for smooth relocation of airport functions. In addition, CP of the ANS team of the CAAM have positively coordinated the online meeting with the Japanese expert team so that relocation process was smoothly completed.

### **2-2 Undesirable Effects**

- a) Delayed assignment of POA Staff and unexperienced POA Staff for airport services

At the end of 2015, assignment of POA staff to which JICA experts could have conducted technical transfer was only 13 and that was far from sufficient. In addition, among staff assigned to POA, there were only a few who had experience in airport operation. This made the technical transfer of JICA experts more difficult.

- b) Unstable assignment of the staff

During the project period, the CP members has been changed many times so that the coordination between CPs and Japanese experts has been difficult sometimes. Also, there were some cases that some staffs quit their job after the training of the project. Unstable assignment of staff had made technical transfer of JICA experts more difficult.

- c) Delay of construction works

There was a significant delay in construction works of airport facilities, especially of Administration Building, Maintenance Building, Cargo Terminal, Hangars and Catering Facilities, which were the responsibility of the Mongolian side. Uncertainty of completion of those facilities made the opening date of NUBIA uncertain, and affected the progress of the project activities.

- d) Delay of establishment of NUBIA operator

It took more than three years for establishment of NUBIA operator, starting from proposal from the Japanese consortium, evaluation of the proposal, negotiation/signing of the concession contract. The extended process delayed the opening of NUBIA, which led to the extension of the period of the Project.

- e) Covid-19 pandemic

Outbreak of Covid-19 pandemic in early 2020 further delayed the opening date of NUBIA by

one year to July 2021. The Project period was accordingly extended, which lowered the efficiency of the Project.

### **3. Evaluation on the Results of the Project Risk Management**

Actions taken against undesirable effects were as follows:

- a) Delayed assignment of POA Staff and unexperienced POA Staff

The Mongolian side strengthen the staffing of POA to 55 by the middle of 2018, including those from the former Ulaanbaatar Airport.

- b) Unstable assignment of the staff

JICA set up the meeting with the Mongolian side and NUBIA LCC in order to discuss the communication closely for the smooth implementation of the project.

- c) Delay of construction works

The Mongolian side accelerated the construction of Administration Building, Maintenance Building and Cargo Terminal for completion by the end of 2018. The completion of Hangars and Catering Facilities slid into 2021 due to Covid-19 pandemic.

- d) Delay of establishment of NUBIA operator

The Mongolian side and NUBIA LLC agreed on the earliest opening of the NUBIA as within ten months from the conclusion of the concession agreement on September 2019.

- e) Covid-19 Pandemic

Although Covid-19 pandemic was out of control of the Project, the Mongolian side minimized the delay of the NUBIA opening to one year, and made a best effort for relocation of airport functions from the former Ulaanbaatar Airport for the NUBIA opening on 4 July 2021.

### **4. Lesson Learned**

- a) The efficiency of this Project was low as the project period was extended five times from the original project period. For the capacity development project for inauguration of new airport operation, it is desirable that the project should be started with firmer opening date of the new airport so that the project is implemented efficiently.
- b) In order to coordinate the relocation of the airport, a lot of regular meetings such as the weekly meeting among CAAM, NUBIA LLC and JICA, and the monthly meeting among the Embassy of Japan in Mongolia, NUBIA LLC and JICA had been held. These close communications among stakeholders attributed to the smooth relocation of the airport.
- c) The relocation and allocation of the staffs are significant issues with the relocation of the airport. Since the skill required for aviation industry is unique and there are variety of stakeholders in the aviation industry compared with the other industry, advanced planning of the staff relocation and allocation is desirable not only for the capacity development project but also for the relocation of the airport.

## **IV. FOR THE ACHIEVEMENT OF OVERALL GOALS AFTER THE PROJECT COMPLETION**

## 1. Prospects to achieve Overall Goal

The overall goal of the Project is “NUBIA, capital airport of Mongolia, is upgraded in its capacity to be able to function appropriately in case of rapid increase of customers as the gateway of the country”. Two indicators below were set up to evaluate the achievement of the overall goal. Prospects to achieve those indicators are also indicated in the table below:

Indicator for Overall Goal		Prospects at the Project Completion
1	NUBIA is installed with the capacity to handle annual demand of passengers of 2 million properly.	NUBIA was developed to cope with more than 2 million passengers per annum. This indicator has been achieved already.
2	Convenience of stakeholders, such as airlines using NUBIA, is increased.	This indicator is expected to be achieved in a few years when air passenger demand at NUBIA recovered to the pre-Covid-19 level.

## 2. Plan of Operation and Implementation Structure of the Mongolian Side to achieve Overall Goal

- a) NUBIA LLC concluded the concession contract with the Mongolian Government for 15 years and is supposed to continue the operation and maintenance of NUBIA to achieve the overall goal of the Project.

## 3. Recommendation for the Mongolian Side

- a) The Mongolian Government and NUBIA LCC should maintain and obey the concession contract for the sustainable operation and maintenance of NUBIA.
- b) In order to increase the number of international flights, the Mongolian Government is recommended to advance the “Open Sky Policy” so that there would be fair and free competition in the aviation industry.





# Annex 1: Results of the Project

## 1. List of Dispatched Experts

The list of dispatched experts is indicated below:

Position/Technical Field	Name	Organization
<b>Long-term Experts</b>		
- Chief Advisor	Masatomo KIHARA	MLIT
- Airport Relocation/Project Coordinator	Kishiro HIRANO	JICA
- Project Coordinator	Satoshi IJIMA Mitsuo TAKAMURA	JICA JICA
<b>Short-term Experts (Airport)</b>		
- Project Manager/Airport Relocation/ Civil Engineer/Snow Removal (1)	Norifumi YOSHIDA	NAA
- Deputy Project Manager/Terminal Facilities/Communication Facilities (1)/Information Technology (1)	Akio TAKAYASU	NAA
- Ground Handling Service/Cargo (1)	Yuzuru SHIZUNO	JALUX
- Cargo (1)	Fujio SHIBASAKI	JALUX
- Security (1)	Atsushi OHIRA	NAA
- Airport Operation/Safety (1)	Akira YAEHASHI	NAA
- Airport Planning/Organization/Human Resource	Hideo KANAYA	NAA
- Civil Engineer/Snow Removal (2)	Katsuyoshi KOSAKU	NAA
- Special Equipment (1)	Takuya MIZUTA	NAA
- Special Equipment (2)	Hisato INAGAKI	NAA
- Machinery Facilities (1)	Harutaka FUJIHIRA	NAA
- Machinery Facilities (2)	Toshiyuki NAKAJIMA	NAA
- Electrical Equipment (1)	Kenichi FUSE	NAA
- Electrical Equipment (2)	Kazuo HARA	NAA
- Communication Facilities (2)	Makoto HONDA	NAA
- Information Technology (2)	Mitsuhiro NAKAJIMA	NAA
- Fuel Supervision (Safety Management)	Akihiro KIKUCHI	NAA
- Fuel Business Management		
- Fuel Facility Management	Toshiya UNOZAWA	NAA
- Fuel Operations and Maintenance	Kazuhiro AKIMOTO	NAA
- Fuel Wing Service	Yoshiaki KURODA	NAA
- Tenant Management	Ryo TAKEI	JAT
- Charge Setting/Income and Expenditure Planning	Kenichi ONE	NAA
- Customer Service Improvement (1)	Yasuhiro ASO	NAA
- Customer Service Improvement (2)	Nozomi AMEMIA	NAA
- Monitoring Evaluation (1)	Akira AKASAKA	NAA
- Monitoring Evaluation (2)	Hideo SATAMOTO	NAA
<b>Short-term Experts (ANS)</b>		
- ANS Chief Advisor/Pre-operation Planner	Yukio HASEBE	JRANSA
- ANS Sub-Chief Advisor/ATC Training Expert	Hideo WATANABE	ATCAJ
- CNS Training Expert (1)	Jiro HARADA	JRANSA
- CNS Training Expert (2)	Mamoru YAMADA	JRANSA
- Flight Training Expert	Norio MURAI	JRANSA
- Flight Procedure Design Expert (1)	Shinji HARA	ATCAJ
- Flight Procedure Design Expert (2)	Naoki SAKAMOTO	ATCAJ
- Procurement Supporter for FPD Training System	Satoko TSUNODA	JRANSA
- Monitoring Expert	Teruhiro HISATOMI	JRANSA
Total	39	-

## 2. List of Counterparts

The list of counterparts by organization is indicated below:

- Ministry of Road and Transportation (MRT)
- Ministry of Road and Transport Development (MRTD)
- Civil Aviation Authority of Mongolia (CAAM)
- National Civil Aviation Center, CAAM
  - Airport Services Department, CAAM
  - Pre-Operation Unit (POU)
  - Pre-Operation Division (POD)
  - Pre-Operation Administration (POA)
  - Chinggis Khaan International Airport (CKIA)
  - Project Implementation Unit (PIU)
  - Relocation Countermeasure Headquarters
  - Air Navigation Services Department
    - Air Traffic Control (ATC) Services
    - Aeronautical Information Services (AIS)
    - Communications, Navigation & Surveillance (CNS) Services
    - Flight Procedure Design Services (FPDS)
  - ANS Pre-Operation Working Group
  - Ground Handling and Fuel Supply Services
- NUBIA LLC (NUBIA Operator)

## 3. List of Trainings in Japan

The list of trainings in Japan is indicated below:

Training	Contents
<b>Airport Training</b>	
- Airport Management (Airport Planning/Organization/Human Resource)	<ul style="list-style-type: none"> <li>• Management system and airport management &amp; operation system in Japan</li> <li>• System design for outsourcing</li> <li>• Method of making contract documents and the flow of contract procedures, etc.</li> </ul>
- Airport Operation (Ground Handling/Cargo)	<ul style="list-style-type: none"> <li>• Ground Handling Service and Service Facilities at Narita Airport</li> <li>• Outline of IATA Standard for Ground Handling Agreement</li> <li>• Case study of Ground Handling Service &amp; Cargo Operation by Japanese companies, etc.</li> </ul>
- Airport Management (Airport Facilities)	<ul style="list-style-type: none"> <li>• Airport management and control technology in Japan</li> <li>• Passenger terminal building management at Haneda Airport</li> <li>• Management and operation of Narita airport and preparation schedule of airport opening, etc.</li> </ul>
- Operation and Maintenance of Airport Facilities (1)	<ul style="list-style-type: none"> <li>• Airport management and airport facility maintenance method</li> <li>• Case Study of airport management by Japanese companies</li> <li>• The need for comprehensive preparation work with the schedule of airport opening, etc.</li> </ul>
- Operation and Maintenance of Airport Facilities (2)	<ul style="list-style-type: none"> <li>• Airport management and airport facility maintenance method</li> <li>• Airport operation preparation schedule at Narita Airport</li> <li>• Case Study of airport management by Japanese companies</li> <li>• Functions of airport operation information center and emergency response room, etc.</li> </ul>
- Operation and Maintenance of Airport	<ul style="list-style-type: none"> <li>• Inline screening System which to be introduced for the first time in Mongolia</li> </ul>

Facilities (Inline Screening System and Aerodrome Facilities)	<ul style="list-style-type: none"> <li>Repairing method of concrete pavement, by learning examples of Narita Airport</li> </ul>
- Operation and Maintenance of Airport Facilities (Operation Monitoring and Aerodrome Facilities)	<ul style="list-style-type: none"> <li>Operation monitoring service which to be introduced for the first time in Mongolia</li> <li>Repairing method of concrete pavement, by learning examples of Narita Airport</li> </ul>
- Aviation Fuel Facility (Management)	<ul style="list-style-type: none"> <li>Refueling facility overview, basic requirement, fuel supply system in Narita Airport</li> <li>Basic knowledge concerning refueling business</li> <li>Facility management and maintenance method, etc.</li> </ul>
- Aviation Fuel Facility (Business Management)	
- Aviation Fuel Facility (Operation and Maintenance) (Maintenance)	<ul style="list-style-type: none"> <li>Quality Control</li> <li>Maintenance of Tank, Hydrant, etc. (other fuel facilities)</li> </ul>
- Aviation Fuel Facility (Operation and Maintenance) (DCS)	<ul style="list-style-type: none"> <li>Operation of DCS</li> <li>Inventory Control &amp; Fuel Supply Planning</li> </ul>
- Aviation Fuel Facility (Wing Service)	<ul style="list-style-type: none"> <li>Wing Service Operation</li> <li>Maintenance of Dispenser</li> </ul>
- Tenant Management/Charge Setting/Income and Expenditure Planning (1)	<ul style="list-style-type: none"> <li>Management of tenants and overview of duty-free shops at Haneda Airport</li> <li>Case study of commercial facility development at Haneda Airport</li> <li>Charge setting, collection method and concept of income &amp; expenditure planning at Narita Airport</li> <li>Financial planning and property management of Narita Airport etc.</li> </ul>
- Tenant Management/Charge Setting/Income and Expenditure Planning (2)	<ul style="list-style-type: none"> <li>Management of tenants and overview of duty-free shops at Haneda Airport &amp; Narita Airport</li> <li>Case study of commercial facility development at Haneda Airport &amp; Narita Airport</li> <li>Charge setting, collection method and concept of income &amp; expenditure planning at Narita Airport</li> <li>Financial planning and property management of Narita Airport etc.</li> </ul>
- Customer Satisfaction Improvement (1)	<ul style="list-style-type: none"> <li>CS Promotion Organization and educational activities of Narita Airport</li> <li>Overview and Airport Service of New Chitose Airport</li> <li>CS activities and development of attractive commercial facilities in Haneda Airport</li> <li>Approach to improve access to the airport etc.</li> </ul>
- Customer Satisfaction Improvement (2)	<ul style="list-style-type: none"> <li>CS Promotion Organization and educational activities of Narita Airport &amp; Chubu Airport</li> <li>Overview and Airport Service of Chubu Airport &amp; New Chitose Airport</li> <li>CS activities and development of attractive commercial facilities in Narita Airport</li> <li>Approach to improve access to the airport etc.</li> </ul>
ANS Training	
- ANS Preparation	<ol style="list-style-type: none"> <li>Ministry of Land, Infrastructure and Transport <ul style="list-style-type: none"> <li>Outline of air traffic control operations in Japan</li> <li>Maintenance and operation management of radio facilities</li> <li>Maintenance and operation management of aviation lights and electric facilities</li> </ul> </li> <li>Narita Airport Office <ul style="list-style-type: none"> <li>Agreement between the country concerning air traffic control and the company etc., and airport control overview</li> <li>Agreement between the country and the company concerning the operation of air traffic control equipment, operation and maintenance of air traffic control equipment such as MLAT</li> </ul> </li> <li>Narita International Airport Co., Ltd. <ul style="list-style-type: none"> <li>Airport operation service, operation management work</li> </ul> </li> </ol>

	<p>(arrangement with aviation station (limited to lamp control), and mechanism of information exchange)</p> <ul style="list-style-type: none"> <li>- Operation and maintenance work of ILS etc. and matters concerning radio facilities etc.</li> <li>- Matters concerning airfield lighting system and operations/spare parts management of airfield lighting system</li> </ul> <p>4. Chubu Airport Office</p> <ul style="list-style-type: none"> <li>- Preparation work related to operation and maintenance of air traffic control equipment and start of service of Chubu Airport</li> <li>- Agreement with the Chubu Airport concerning air traffic control · Agreement, Training plans etc. related to the start of the operation of Chubu Airport</li> </ul> <p>5. Chubu International Airport Co., Ltd.</p> <ul style="list-style-type: none"> <li>- Responsibility sharing and cooperation system between Aviation Bureau and Chubu International Airport Co., Ltd.</li> <li>- Outline of operations of Chubu International Airport Co. Ltd.</li> </ul> <p>6. Fukuoka Air Traffic Control Department</p> <ul style="list-style-type: none"> <li>- Outline of air route control work related to Fukuoka FIR</li> <li>- Operation and maintenance of air traffic control equipment (related to air traffic control)</li> </ul> <p>7. Air Traffic Management Center (ATMC)</p> <ul style="list-style-type: none"> <li>- Air traffic flow management, airspace management, offshore management operations</li> <li>- Operation and maintenance of air traffic control equipment (related to air traffic management)</li> </ul>
<p>- Flight Inspection</p>	<p>1. Ministry of Land, Infrastructure and Transport</p> <ul style="list-style-type: none"> <li>- The overview of Air Navigation Services in the Civil Aviation Bureau of Japan</li> <li>- Flight Inspection Services in Japan</li> </ul> <p>2. Aeronautical Information Center</p> <ul style="list-style-type: none"> <li>- AIS management, process of AIP publication</li> </ul> <p>3. Flight Inspection Center</p> <ul style="list-style-type: none"> <li>- Outline of Flight Inspection work</li> <li>- Outline of flight Inspection aircraft and inspection equipment</li> <li>- Outline of Flight Verification work</li> <li>- Process of determining flight procedure</li> <li>- Validation of PBN (Flight verification standards / instructions)</li> <li>- Nav Database for verification (Outline, Process)</li> <li>- Flight verification by VSIM</li> <li>- Flight inspection by PBN method</li> <li>- Inspection aircraft pre-boarding briefing</li> <li>- Boarding Flight Inspection aircraft</li> <li>- Flight Validation review</li> <li>- Portable Flight Inspection system</li> <li>- Management of Flight Inspection / verification results</li> <li>- Calibration of inspection system (GSE)</li> <li>- Training Summary, Award certificate</li> </ul>
<p>- CNS</p>	<p>1. Ministry of Land, Infrastructure and Transport</p> <ul style="list-style-type: none"> <li>- Outline of Air Navigation Services in Japan</li> <li>- Explanation of Training Scheme of CNS ATSEP persons</li> <li>- Briefly discussion for AFL services</li> </ul> <p>2. Haneda Airport Office</p> <ul style="list-style-type: none"> <li>- Overview of CNS Facilities in Haneda Airport</li> </ul>

	<ul style="list-style-type: none"> <li>- Managements of CNS spare parts (APPS system)</li> <li>- Maintenance Training method of D-VOR (DVOR-07A)</li> <li>- Study tour for IFR, VFR and Airfield CNS</li> </ul> <ol style="list-style-type: none"> <li>3. IWANUMA ASC (Aeronautical Safety Collage) Training Center <ul style="list-style-type: none"> <li>- Obstacle Search Principle and Example (DVOR)</li> <li>- Introduction of past difficult Failure of VOR</li> <li>- ILS Maintenance and Flight Inspection</li> <li>- ILS Failure Cases Study</li> <li>- Method of ILS Operation Category III</li> </ul> </li> <li>4. Narita International Airport Co., Ltd <ul style="list-style-type: none"> <li>- Outline of Narita Airport CNS/AFL Facilities</li> <li>- Study tour of Supervising System for NAA CNS/AFL</li> <li>- Observing of Mid-Night activities for AFL service</li> </ul> </li> <li>5. TOKYO ACC. <ul style="list-style-type: none"> <li>- Outline of operations of Tokyo ACC</li> <li>- Study tour for ACC operation and CNS/Electric activities</li> </ul> </li> <li>6. Technical Management Center (TMC) <ul style="list-style-type: none"> <li>- Outline of TMC</li> <li>- Study tour of Evaluation System for CNS Technical Management</li> <li>- Obstacle information and Safety information Sharing</li> <li>- Management of CNS Spare Parts (APPS system)</li> </ul> </li> </ol>
<ul style="list-style-type: none"> <li>- ATC</li> </ul>	<ol style="list-style-type: none"> <li>1. Ministry of Land, Infrastructure and Transport <ul style="list-style-type: none"> <li>- The overview of Air Navigation Services in the Civil Aviation Bureau of Japan</li> <li>- ATC Training in Japan</li> </ul> </li> <li>2. Chubu International Airport <ul style="list-style-type: none"> <li>- Air traffic control in Chubu International Airport</li> <li>- Training program and assessment</li> <li>- Non Radar ATC operations</li> <li>- ATCO Training Transfer to New AIRPORT from RJNN to RJGG</li> <li>- Observation of tower simulator</li> <li>- How to make a ground scale model set for training</li> </ul> </li> <li>3. Chubu International Airport Co., Ltd. <ul style="list-style-type: none"> <li>- Airport operation at Centrair</li> </ul> </li> </ol>

## 4. Revised Plan of Operation (PO)

### 4-1 PO ver. 1 (26 September 2014)

Plan of Operation (PO) (draft)

Annex 2

Project for Human Resource Development and O&M Capacity Development for New Ulaanbaatar International Airport

Schedule	1st Year												2nd Year												3rd Year											
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9			
	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	
<b>1. O&amp;M organization is established with the development of O&amp;M organization plan which includes staff allocation plan.</b>																																				
1-1 Review the present situation of O&M at Chinggis Khaan International Airport																																				
1-2 Explain the O&M mechanism as well as activities taken in Japanese airport(s) with some field visits																																				
1-3 Support the implementation of Action Plan for establishing O&M organization at NUBIA (including staff allocation)																																				
1-4 Provide training on airport operation																																				
<b>2. Mechanism for maintenance is established with the development of maintenance plan in the field of runway, etc.</b>																																				
2-1 Review the present situation of maintenance of runway, etc. at Chinggis Khaan International Airport																																				
2-2 Explain the mechanism as well as activities taken in Japanese airport(s) in the field of maintenance of runway, etc. with some field visits																																				
2-3 Support the implementation of Action Plan for maintenance of runway, etc. at NUBIA																																				
2-4 Provide training in some priority fields in maintenance of runways, etc.																																				
<b>3. Mechanism for O&amp;M is established with the development of O&amp;M plan in the field of fuel supply system.</b>																																				
3-1 Review the present situation of O&M of fuel supply system at Chinggis Khaan International Airport																																				
3-2 Explain the O&M mechanism as well as activities taken in Japanese airport(s) in the field of fuel supply system with some field visits																																				
3-3 Support the implementation of Action Plan for O&M in the field of fuel supply system at NUBIA																																				
3-4 Provide training in some priority fields in O&M of fuel supply system																																				
<b>4. Appropriate charge is set for NUBIA and mechanism for tenant management is established.</b>																																				
4-1 Review the present situation of operation as well as profitability of Chinggis Khaan International Airport																																				
4-2 Explain the charge setting methods as well as tenant management taken in Japanese airport(s) with some field visits																																				
4-3 Support the implementation of Action Plan for charge setting at NUBIA																																				
4-4 Support the implementation of Action Plan for tenant management at NUBIA																																				
4-5 Provide training on tenant management																																				
<b>5. Mechanism for customer satisfaction (CS) improvement is established with the development of the plan in the concerned field.</b>																																				
5-1 Review the present situation of customer services at Chinggis Khaan International Airport																																				
5-2 Explain the mechanism as well as activities taken in Japanese airport(s) in the field of customer satisfaction (CS) improvement with some field visits																																				
5-3 Support the implementation of Action Plan for customer satisfaction (CS) improvement																																				
5-4 Provide training on customer satisfaction (CS) improvement																																				
<b>6. Mechanism for smooth inauguration of the airport is prepared with the development of relocation master plan.</b>																																				
6-1 Review the procedures as well as the progress of preparation for start up and commissioning of NUBIA																																				
6-2 Explain the method as well as the activities taken in Japanese airport(s) in the field of airport relocation																																				
6-3 Support the implementation of Action Plan for airport relocation to NUBIA																																				
<b>Administrative Activities</b>																																				
Hold the JCM meetings																																				
Make decision on Detailed Plan																																				
Submit the Inception Report																																				
Make a report of the Project completion																																				
Submit the monitoring sheets																																				
Make joint reviews on the results of the monitoring																																				









# 4-4 PO ver. 3 (7 April 2017)

Annex4: Plan of Operation (PO) (2nd Amended)  
 Project for Human Resource Development and O&M Capacity Development for New Ulaanbaatar International Airport (NUBIA)  
 Implementing Entity: Ministry of Roads and Transport Development (MRTD)

Project Implementation Period: 29/1/2015-27/07/2018 (42 months)

Annex 1 - 10

Outputs/Activities	2015												2016												2017												2018											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul					
<b>1. O&amp;M organization is established with the development of O&amp;M organization plan which includes staff allocation plan.</b>																																																
1-1 Review the present situation of O&M at Chinggis Khaan International Airport																																																
1-2 Learn the O&M mechanism as well as activities taken in Japanese airport(s) with some field visits																																																
1-3 Implement Action Plan for establishing O&M organization at NUBIA (including staff allocation)																																																
1-4 Conduct training on airport operation																																																
<b>2. Mechanism for maintenance is established with the development of maintenance plan in the field of runway, etc.</b>																																																
2-1 Review the present situation of maintenance of runway, etc. at Chinggis Khaan International Airport																																																
2-2 Learn the mechanism as well as activities taken in Japanese airport(s) in the field of maintenance of runway, etc. with some field visits																																																
2-3 Implement Action Plan for maintenance of runway, etc. at NUBIA																																																
2-4 Conduct training in some priority fields in maintenance of runways, etc.																																																
<b>3. Mechanism for O&amp;M is established with the development of O&amp;M plan in the field of fuel supply system.</b>																																																
3-1 Review the present situation of O&M of fuel supply system at Chinggis Khaan International Airport																																																
3-2 Learn the O&M mechanism as well as activities taken in Japanese airport(s) in the field of fuel supply system with some field visits																																																
3-3 Implement Action Plan for O&M in the field of fuel supply system at NUBIA																																																
3-4 Conduct training in some priority fields in O&M of fuel supply system																																																
<b>4. Appropriate charge is set for NUBIA and mechanism for tenant management is established.</b>																																																
4-1 Review the present situation of operation as well as profitability of Chinggis Khaan International Airport																																																
4-2 Learn the charge setting methods as well as tenant management taken in Japanese airport(s) with some field visits																																																
4-3 Implement Action Plan for charge setting at NUBIA																																																
4-4 Implement Action Plan for tenant management at NUBIA																																																
4-5 Conduct training on tenant management																																																
<b>5. Mechanism for customer satisfaction (CS) improvement is established with the development of the plan in the concerned field.</b>																																																
5-1 Review the present situation of customer services at Chinggis Khaan International Airport																																																
5-2 Learn the mechanism as well as activities taken in Japanese airport(s) in the field of customer satisfaction (CS) improvement with some field visits																																																
5-3 Implement Action Plan for customer satisfaction (CS) improvement																																																
5-4 Conduct training on customer satisfaction (CS) improvement																																																
<b>6. Mechanism for smooth inauguration of the airport is prepared with the development of relocation master plan.</b>																																																
6-1 Review the procedures as well as the progress of preparation for start up and commissioning of NUBIA																																																
6-2 Learn the method as well as the activities taken in Japanese airport(s) in the field of airport relocation																																																
6-3 Implement Action Plan for airport relocation to NUBIA																																																
<b>7. Capacity of CAAM is developed for supervision of ANS at NUBIA.</b>																																																
7-1 Pre-operation Plan																																																
7-1-1 Develop a draft Pre-operation Plan																																																
7-1-2 Improve the Pre-operation Plan based on analysis on the draft																																																
7-1-3 Learn practices of airport/ANS coordination in Japan (including training in Japan)																																																
7-1-3 Monitor progress of Pre-operation Plan, and adjust if necessary																																																
7-2 Opening Day Plan																																																
7-2-1 Develop an Opening Day Plan																																																
7-2-2 Monitor progress of Opening Day Plan, and adjust if necessary																																																
7-3 Safety Assessment																																																
7-3-1 Conduct preparatory work for receiving safety assessment by CAAM inspectors																																																
7-3-2 Receive safety assessment of ANS at NUBIA by CAAM inspectors																																																
7-4 Training of ATC officers																																																
7-4-1 Develop Training Program for ATC Officers																																																
7-4-2 Develop ATC Operation Procedures																																																
7-4-3 Conduct Training on ATC Operation Procedures																																																
7-4-4 Conduct simulator and test operation training																																																
7-4-5 Development Rating Standard																																																
7-4-6 Implement rating of ATC officers																																																
7-5 Training of CNS Engineers																																																
7-5-1 Develop Training Program for CNS Engineers																																																
7-5-2 Develop CNS Maintenance Procedures																																																
7-5-3 Conduct training on CNS Maintenance Procedures																																																
7-5-4 Conduct On-the-Job Training of CNS engineers																																																
7-5-5 Develop Tentative CNS Maintenance Procedures																																																
7-5-6 Implement Tentative CNS Maintenance at NUBIA																																																
7-6 Training of Flight inspection engineers																																																
7-6-1 Develop flight inspection procedures																																																
7-6-2 Conduct On-the-Job Training of Flight inspection engineers																																																
7-7 Development of Flight Procedures for NUBIA																																																
7-7-1 Design instrument flight procedures (IFPs)																																																
7-7-2 Conduct grand validation																																																
7-7-3 Conduct flight calibration/validation																																																
7-7-4 Produce aeronautical charts for AIP																																																
7-7-5 Produce aeronautical charts for AIP																																																

Inauguration of New Ulaanbaatar International Airport

ATC Simulator

FA FV K

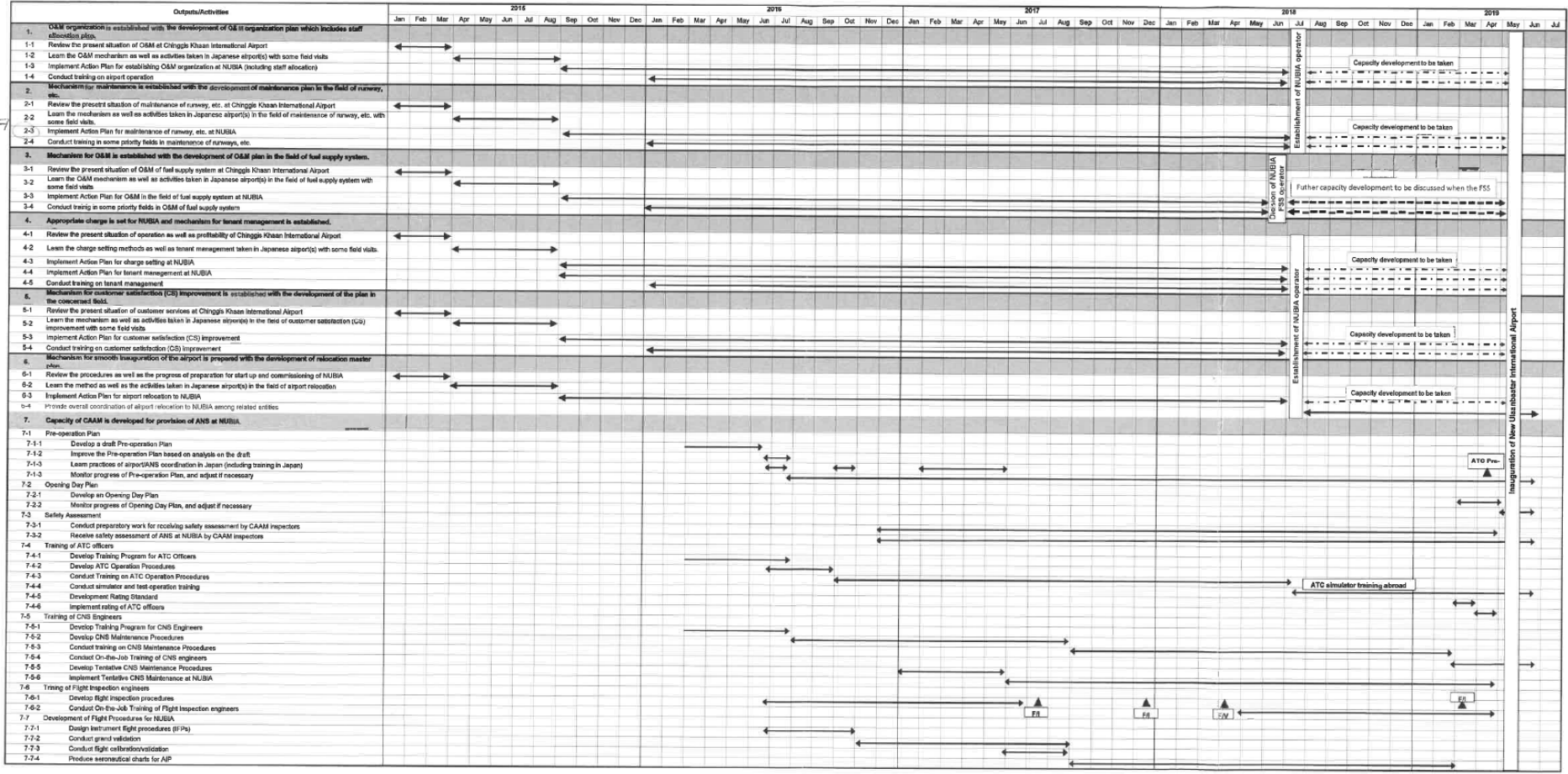




# 4-6 PO ver. 4 (5 June 2018)

Annex2: Plan of Operation (PO) (3rd Amended) ; Latest case (opening in May 2019)  
 Project for Human Resource Development and OAM Capacity Development for New Usulutani International Airport (NUBIA)  
 Implementing Entity: Ministry of Roads and Transport Development (MRTD)

Project Implementation Period: 28/12/2015-27/07/2019 (54 months)



Annex 1 - 13

2











Project Monitoring Sheet II (Revision of Plan of Operation) (2/2)

Version 7 (2/2)

Dated 31 January 2021

Project Title: Project for Human Resource Development and O&M Capacity Development for New Ulaanbaatar International Airport (NUBIA) (ANS)													Monitoring				
Inputs													Issue	Solution			
Activities													Japan	Mongolia	Issue & Countermeasures		
<b>Inputs</b> <b>Expert</b> ANS Chief Advisor ATC Training Expert CNS Training Expert (1) CNS Training Expert (2) Flight Inspection Expert Flight Procedure Design Expert (1) Flight Procedure Design Expert (2) Flight Procedure Design System Procurement support <b>Equipment</b> Automated Flight Procedure Design System <b>Training in Japan</b> Training Course(Maria, Cydia, Fukuoka/ATM, etc.) <b>In-country/Third country Training</b> Flight Procedure Design Training Course													Remarks			Issue	Solution
<b>Activities</b> <b>Sub-Activities</b> Output 1-1: Pre-operation Plan 1-1-1 Develop a draft Pre-operation Plan 1-1-2 Improve the Pre-operation Plan based on analysis on the draft 1-1-3 Learn practices of airport/ANS coordination in Japan (including training in Japan) 1-1-4 Monitor progress of the Pre-operation Plan, and adjust if necessary Output 2: Opening Day Plan 2-1 Develop an Opening Day Plan 2-2 Monitor progress of the Opening Day Plan, and adjust if necessary Output 2-3: Safety Assessment 2-3-1 Assess risk and occurrence of unsafe events associated with new services 2-3-2 Develop safety measures for critical safety issues Output 2-4: Training of ATC officers 2-4-1 Develop training program for ATC officers 2-4-2 Develop ATC Operation Procedures 2-4-3 Conduct training on ATC Operation Procedures 2-4-4 Conduct simulator and test-operation training 2-4-5 Develop Rating Standard 2-4-6 Implement rating of ATC officers Output 2-5: Training of CNS engineers 2-5-1 Develop training program for CNS engineers 2-5-2 Develop CNS Maintenance Procedures 2-5-3 Conduct training on CNS Maintenance Procedures 2-5-4 Conduct On-the-Job Training of CNS engineers 2-5-5 Develop Tentative CNS Maintenance Procedures 2-5-6 Implement Tentative CNS Maintenance at NUBIA Output 2-6: Training of Flight Inspection engineers 2-6-1 Develop flight inspection procedures 2-6-2 Conduct On-the-Job Training of Flight Inspection engineers Output 2-7: Development of Flight Procedures for NUBIA 2-7-1 Design instrument flight procedures (IFPs) 2-7-2 Conduct ground validation 2-7-3 Conduct flight calibration/validation 2-7-4 Production of aeronautical charts for AP													Responsible Organization			Achievements	Issue & Countermeasures
<b>Duration / Phasing</b> 2019 2020 2021 01 02 03 04 05 06 07 08 09 10 11 12 01 02 03 04 05 06 07 08 09 10 01 02 03 04 05 06 07 08 09 10													Remarks			Issue	Solution
<b>Monitoring Plan</b> Joint Coordinating Committee Set-up the Detailed Plan of Operation Submission of Monitoring Sheet Monitoring Mission from Japan Joint Monitoring Post Monitoring <b>Reports/Documents</b> Project Completion Report <b>Public Relations</b>													Remarks			Issue	Solution



## **Annex 2: List of Products produced by the Project**

### **1. Airport**

The list of the products produced by the Project for the capacity development of operation and maintenance of NUBIA is indicated below:

#### **1-1 Airport Planning · Organization · Staff Planning**

- (1) Organization planning (NUBIA)
- (2) NUBIA Operator's organization chart study
- (3) Organization manpower planning schedule draft
- (4) List of manuals
  - (a) Organization Chart and Duty Allocation Procedure
  - (b) The Board of Directors' Procedure
  - (c) Chinggis Khaan International Airport Employee Ethics Rule
  - (d) Quality Assurance
  - (e) Document Control Procedure
  - (f) Contract Management Procedure
  - (g) Procedure of Plan Development, Its Approval and Report
  - (h) Archives and Records Management Procedure
  - (i) Internal Administration Procedure
  - (j) Employees' Social Welfare Procedure
  - (k) Award and Bonus Procedure
  - (l) Human Resource Recruitment and Selection Procedure
  - (m) Employee Evaluation Procedure
  - (n) Training and Employee Development Procedure
  - (o) Short-Term Business Plan Development Method
- (5) List of items to be purchased (Preparation cost for commercial operation)

#### **1-2 Ground Handling**

- (1) Action Plan 1 Documents relating Organization
  - (a) CAAM GHD regulation List (GHD: Ground Handling Department)
  - (b) CAAM Organization Chart
  - (c) CAAM GHD Members
  - (d) NUBIA Organization chart (2018.03.20)
- (2) Action plan 2 Documents relating Personnel
  - (a) NUBIA operation and maintenance members
  - (b) Necessary number of staff O&M at NUBIA
  - (c) GSE class and labor rate
  - (d) Peak hour manning calculation

- (e) GSE Maintenance Manning Calculation
  - (f) NUBIA Operation job requirements
  - (g) NUBIA Maintenance job requirements
  - (h) Occupational & Health safety equipment budget
  - (i) List of occupational & Health safety equipment
- (3) Action Plan 3 Documents relating GSE (Ground Support Equipment)
- (a) GSE to be transfer from CAAM GHD
  - (b) NUBIA project supplying GSE
  - (c) GSE at NUBIA
  - (d) GSE Dimension at NUBIA
  - (e) GSE Makers Documents
  - (f) GSE fuel consumption study
  - (g) NUBIA GSE Fire Extinguishers and Chokes List
  - (h) NUBIA GSE List (Number Plates)
  - (i) GSE Insurance and Tax expense
  - (j) GSE Fuel budget
  - (k) Necessary Fuel Type for GSE
  - (l) GSE Fuel Station (Location)
  - (m) GSE Fuel Station Plan
  - (n) GSE Fuel Station Specifications
- (4) Action Plan 5 Documents relating Manuals, Rules and Regulations
- (a) Aerodrome Manual Chapter 11 Vehicle control
  - (b) Airside Driving Safety Rules Handbook
  - (c) Ground Handling Service Unit Operation Manual
  - (d) Standard Ground Operations Procedures
  - (e) Vehicle Maintenance Service Unit Operation Manual
- (5) Action Plan 6 relating Training Plan
- (a) NUBIA Ground Handling OJT Plan
  - (b) NUBIA Ground Handling Training Plan
- (6) Action Plan 9 Documents relating Others
- (a) GSE Building Office Furniture
  - (b) GSE Maintenance Equipment and Tools
- (7) Action Plan 10 Documents relating Relocation
- (a) GSE Transported Dimension
  - (b) Relocation of GSE and Parts List
  - (c) Relocation Plan
  - (d) Relocation Report (2017.07.31)
  - (e) Relocation Road from CKIA to NUBIA
  - (f) GSE Garage Parking Plan

### **1-3 Cargo**

- (1) Action Plan 1 Documents relating Organization
- (2) Action Plan 2 Documents relating Personnel
- (3) Action Plan 3 Documents relating Facilities
- (4) Action Plan 4 Document relating Equipment
- (5) Action Plan 5 Document relating Operation
  - (a) Cargo Terminal Operation Manual
- (6) Action Plan 6 Document relating Manuals
  - (a) Cargo Handling Manual
  - (b) SOP (Standard Operation Procedures/Mongolian)
  - (c) NUBIA Manual Codes
  - (d) Draft Manual List
- (7) Action Plan 7 Document relating Training
- (8) Action Plan 8 Document relating Safety and quality control
- (9) Action Plan 9 Document relating Management of cargo terminal
  - (a) SOP (Standard Operation Procedures)
- (10) Action Plan 10 Document relating Others
  - (a) Air Cargo Research
- (11) Action Plan 11 Document relating Relocation
  - (a) Pre-cost assumption
  - (b) Equipment list for relocation
  - (c) Comparison between CKIA and NUBIA
  - (d) Relocation Plan

### **1-4 Airport Operation - Safety**

- (1) Organization structure
- (2) List of agreements
- (3) List of manuals
  - (a) Emergency plan (including emergency contact list)
  - (b) Safety management system
  - (c) Apron management
- (4) List of items to be purchased
- (5) List of items to be relocated from CKIA to NUBIA

### **1-5 Security**

- (1) Organization structure
- (2) Audit and voluntary inspection plan
- (3) List of agreements
- (4) List of manuals

- (a) Airport security program
- (b) Airport security quality control program
- (c) In-line screening procedure
- (d) Airport fire safety regulation
- (e) Passenger terminal building fire safety regulation
- (f) Passenger terminal building evacuation plan
- (5) List of items to be purchased
- (6) List of items to be relocated from CKIA to NUBIA

### **1-6 Tenant Management**

- (1) Working guideline for Tenant Staff
  - (a) NUBIA Profile
  - (b) Service Hospitality
  - (c) Shop Operation Rule
  - (d) Backyard Rule
  - (e) Responses to disasters and crime
- (2) Instruction to prevent potential danger
- (3) Quality Control Regulation
- (4) Sales Promotion Regulation
- (5) Sales Management Regulation
- (6) Transportation and Delivery Regulation
- (7) Facility Maintenance Regulation
- (8) Service and hygiene Regulation
- (9) Advertisement Regulation
- (10) Floor Plan
- (11) Concession Space Rent Roll
- (12) Office Space Rent Roll
- (13) Advertisement Space List (size · fee · spec)
- (14) Parking Fee

### **1-7 Charge Setting · Income & Expenditure Planning**

- (1) Organization structure
- (2) Work flow for preparation of income and expenditure plans
- (3) List of charges and rate tables
- (4) Calculation of charges including elements and concepts
- (5) List of items to be purchased
- (6) List of items to be relocated from CKIA to NUBIA
- (7) List of Manuals

- 1) Financial Management
  - (a) System Financial Procedure
  - (b) Cash Management Procedure
- 2) Accounting
  - (a) Budget approval and implementation procedure
  - (b) Accounting procedure
  - (c) Debt accounting procedure
  - (d) Revenue accounting procedure
  - (e) Expenditure accounting procedure
  - (f) Financial reporting procedure
  - (g) Receivable's accounting procedure
  - (h) Consolidated statement procedure
  - (i) Business segment procedure
- 3) Procurement
  - (a) Procurement procedure
- 4) Asset management
  - (a) Asset accounting procedure
  - (b) Property accounting procedure
  - (c) Fixed asset utilization procedure
  - (d) Fixed asset depreciation procedure
  - (e) Goods accounting procedure
- 5) Methodologies
  - (a) Charge setting methodology
  - (b) Planning method

### **1-8 CS Improvement Activities**

- (1) CEO Order /CS Working Group and CS Committee/
- (2) Member List /CS Working Group and CS Committee/
- (3) Survey Annual Report (2016 2Q).
- (4) CS Activities Plan 2017 and CS Event Plan 2017 2018
- (5) Report of CS Activities and Event 2017
- (6) CS Activities Plan 2018 and CS Event Plan 2018
- (7) Progress Status of CS Activities and Event 2018
- (8) CKIA Japan Training Report
- (9) CS Training Report /Disabilities/
- (10) CKIA CS Manual
- (11) NUBIA Organization Chart
- (12) CKIA and NUBIA Service Compare List
- (13) Passenger Terminal Services Visual

- (14) NUBIA Information Counter map
- (15) NUBIA Customer Suggestion box map
- (16) Preparation Cost for Commercial Operation
- (17) NUBIA CS Improvement Manual
- (18) CS Training for NUBIA
- (19) NUBIA Brochure

### **1-9 Civil Engineer - Snow Removing**

- (1) Organization structure
- (2) Aerodrome manual
  - 1) Part 1. General information
  - 2) Part 2. Aerodrome site information
  - 3) Part 3. AIS information reporting
  - 4) Part 4. Aerodrome operating procedures
    - (a) Aerodrome reporting
    - (b) Access to the movement area
    - (c) Aerodrome emergency plan
    - (d) Rescue and fire fighting service
    - (e) Aerodrome inspection
    - (f) Visual aids electrical systems and lighting
    - (g) Movement area maintenance
    - (h) Aerodrome works safety
    - (i) Apron management
    - (j) Apron safety management
    - (k) Airside vehicle control
    - (l) Wild hazard management
    - (m) Obstacle control
    - (n) Disabled aircraft removal
    - (o) Handling of hazardous material
    - (p) Low visibility operations
    - (q) Protection of radar and navigation aids
  - 5) Part 5. Aerodrome administration and safety management system
- (3) Established the airport obstacle control safety zone at NUBIA
- (4) Determinate of Runway, Taxiway, and apron pavement classification number on NUBIA
- (5) NUBIA aerodrome work drawing plan
  - 1) Prepared and get approved the aerodrome information for AJP publications

### **1-10 Special Equipment**

- (1) Organization structure



- (2) List of NUBIA equipment
- (3) List of manuals
  - (a) X-ray Equipment Control Procedure
  - (b) Nuclear and Radiation Safety Program
  - (c) Security Screening Equipment Maintenance Procedures
  - (d) Passenger Boarding Bridge Maintenance Procedures
  - (e) Baggage Handling System Maintenance Procedures
  - (f) Passenger Elevator Maintenance Procedures
  - (g) Passenger Escalator Maintenance Procedures
  - (h) Automatic Sliding Doors Maintenance Procedures
  - (i) Automatic Shutter Doors Maintenance Procedures
  - (j) Building Management System Maintenance Procedures
  - (k) Explosive Detection System / EDX / Maintenance Procedures
  - (l) Special Equipment Unit Section Procedure
  - (m) Proper Usage Instruction for "CIMC TIANDA BS" Passenger Boarding Bridge
  - (n) Proper Usage of "DAIFUKU" Baggage Handling System
  - (o) Usage Instruction for "SIGMA-OTIS GPR" Passenger Elevator
  - (p) Usage Instruction for "SIGMA-VERA 30-1000" Escalator
  - (q) Usage Instruction for "ASSA ABLOY EMX-2" Automatic Glass Door
  - (r) Operation and Usage Instruction for "Overhead RHX" Electric Door of Luggage Hall
  - (s) Operation and Usage Instruction for Hand Detector (PD140N)
  - (t) Operation and Usage Instruction for Walk-through Metal Detector
  - (u) Usage and Operation Instruction for Building Management System
  - (v) Usage and Operation Instruction for "AXA2400 Power Coil" Airplane Switch and Ground Power
  - (w) Usage Instruction for X-ray HI-SCAN 6040i
  - (x) Usage Instruction for X-ray HI-SCAN 100100T-2is
  - (y) Operation and Usage Instruction for X-ray HI-SCAN 10080 EDX-2is
- (4) List of training
- (5) List of special permits
- (6) List of manufacturers' agencies
- (7) List of items to be purchased
- (8) List of additional works to be carried out
- (9) List of items to be relocated from CKIA to NUBIA
- (10) Education and familiarization training schedule in lead up to start up and commissioning of Special Equipment

## **1-11 Machinery Facilities**

- (1) Organization structure

- (2) List of NUBIA equipment
- (3) List of manuals
  - (a) Facility operation and maintenance manual
  - (b) HVAC unit operation procedure
  - (c) Air handling unit maintenance procedure
  - (d) Chiller system maintenance procedure
  - (e) Fan coil unit maintenance procedure
  - (f) Package air condition cooling system maintenance procedure
  - (g) Heating air curtain maintenance procedure
  - (h) Exhaust fan maintenance procedure
  - (i) Building management system maintenance procedures
  - (j) Air handling unit operation procedure
  - (k) Chiller system operation procedure
  - (l) Fan coil unit operation procedure
  - (m) Package air condition cooling system operation procedure
  - (n) Heating air curtain operation procedure
  - (o) Exhaust fan operation procedure
  - (p) Usage and operation instruction for building management system
- (4) List of training
- (5) List of special permits
- (6) List of manufacturers' agencies
- (7) List of items to be purchased
- (8) List of additional works to be carried out
- (9) Examination of operating methods for heating plant, water treatment plant and sewage treatment plant

## **1-12 Electrical Equipment**

- (1) Organization structure
- (2) List of NUBIA equipment
- (3) List of manuals
  - (a) Electrical unit operation procedure
  - (b) Electrical equipment operation procedure
  - (c) Electrical equipment maintenance procedure
- (1) List of contracts
- (2) List of training
- (3) List of special permits
- (4) List of manufacturers' agencies
- (5) List of items to be purchased

### **1-13 Communications Facilities**

- (1) Organization structure
- (2) List of NUBIA equipment
- (3) List of manuals
  - (a) Security system maintenance procedure
  - (b) Common use system, airport integrated management system maintenance procedure
  - (c) Information technology unit operation procedure
- (4) List of contracts
- (5) List of training
- (6) List of special permits
- (7) List of manufacturers' agencies
- (8) List of items to be purchased
- (9) List of additional works to be carried out
- (10) List of items to be relocated from CKIA to NUBIA

### **1-14 Information & Technology**

- (1) Organization structure
- (2) List of NUBIA equipment
- (3) List of manuals
  - (a) Local area network and communication system maintenance procedure
  - (b) Cyber security procedure
- (4) List of contracts
- (5) List of training
- (6) List of special permits
- (7) List of manufacturers' agencies
- (8) List of items to be purchased
- (9) List of additional works to be carried out
- (10) List of items to be relocated from CKIA to NUBIA

### **1-15 Fuel Facilities**

- (1) Action Plan, To do list
- (2) FSS operational manual
- (3) License of FSS
- (4) Spare parts and manufacturer list
- (5) Training materials
- (6) Certificate of employee training certificate
- (7) Safety and operation manual
- (8) Fuel estimation method records
- (9) Official letter related to FSS

(10) FSS commissioning schedule

(11) Fuel operating scheme proposal (Made by Mr. Dori on Aug, 2016)

## **2. ANS**

The list of the products produced by the Project for the capacity development of Air Navigation Services at NUBIA is indicated below:

### **2-1 ANS Training Materials for ANS Preparation**

- (1) The overview of Air Navigation Services in the Civil Aviation Bureau of Japan
- (2) Maintenance and Operation management of Aeronautical Lighting System and Electrical Facilities
- (3) Maintenance of AIR Navigation System by ATSEP
- (4) Technical Management of CNS Facilities
- (5) Overview of Narita International Airport
- (6) Ground Operations and Management at Narita International Airport
- (7) Narita International Airport Radio Navigation AIDs
- (8) Aeronautical Lighting Maintenance Center
- (9) CHUBU CENTRAIR International Airport
- (10) The preparatory work associated with Chubu International Airport Transfer
- (11) CHUBU CENTRAIR International Airport, Air Traffic Safety Electronics Personnel
- (12) Airport operations at Centrair Sharing of responsibilities and collaborative operations between JCAB and CJAC
- (13) Description of ATSEP Services in Fukuoka ACC

### **2-2 ANS Training Materials for Flight Inspection**

- (1) The overview of Air Navigation Services in the Civil Aviation Bureau of Japan (JCAB HQ)
- (2) Flight Inspection Services in Japan (JCAB HQ)
- (3) The Aeronautical Information Service Center (AIS Center, JCAB)
- (4) Instructor & Schedule (Flight Inspection Center, JCAB)
- (5) FIC Mission Overview (Flight Inspection Center, JCAB)
- (6) Automated Flight Inspection System Overview (Flight Inspection Center, JCAB)
- (7) Summary of JCAB Flight Validation (and Flight Validation Pilot) (Flight Inspection Center, JCAB)
- (8) Summary of JCAB Flight Validation Focused on Preflight Validation (Flight Inspection Center, JCAB)
- (9) FLIGHT INSPECTION of PBN Procedure (Flight Inspection Center, JCAB)
- (10) Navigation Data Base Processing (Flight Inspection Center, JCAB)
- (11) Summary of JCAB VSIM Validation (Flight Inspection Center, JCAB)
- (12) Portable HeliFIS (Flight Inspection Center, JCAB)
- (13) Data/Report Management (Flight Inspection Center, JCAB)
- (14) Sensor Calibration (Flight Inspection Center, JCAB)
- (15) BRIEFING FOR FLIGHT (Flight Inspection Center, JCAB)

## **2-3 ANS Training Materials for CNS**

- (1) CNS Facilities at Tokyo International Airport (Haneda Air Port, JAB)
- (2) Overview, Doppler VHF Omnidirectional radio Range Type DVOR-07A (Iwanuma Training Center, JCAB)
- (3) Learning of the maintenance method, Doppler VHF Omnidirectional radio Range Type DVOR-07A (Iwanuma Training Center, JCAB)
- (4) Obstacle Search Principle and Example, Doppler VHF Omnidirectional radio Range Type DVOR-07A (Iwanuma Training Center, JCAB)
- (5) Introduction of past difficult Failure, Rainwater invasion to VOR CAR Radome (Iwanuma Training Center, JCAB)
- (6) Summary of the TACAN Training (Iwanuma Training Center, JCAB)
- (7) ILS Category (Iwanuma Training Center, JCAB)
- (8) ILS Failure Cases (Iwanuma Training Center, JCAB)
- (9) ILS spare component replace and adjust (Iwanuma Training Center, JCAB)
- (10) ILS Maintenance and Inspection (Iwanuma Training Center, JCAB)
- (11) Training of ILS Flight inspection (LOC) (Iwanuma Training Center, JCAB)
- (12) Iwanuma Training (Iwanuma Training Center, JCAB)
- (13) Overview of Technical Management Center (TMC, JCAB)
- (14) Obstacle information, Safety information Sharing (TMC, JCAB)
- (15) Management of Spare Parts (TMC, JCAB)
- (16) Maintenance and Operation management of Aeronautical Lighting System and Electrical Facilities (ASC, JCAB)
- (17) Training of Visual Aids and Electrical Engineer in Aeronautical Safety College (ASC, JCAB)
- (18) Narita International Airport Aeronautical Ground Lighting Operation & Maintenance (Narita International Airport Corporation)

## **2-4 ANS Training Materials for ATC**

- (1) The overview of Air Navigation Services in the Civil Aviation Bureau of Japan (JCAB HQ)
- (2) Air Traffic Controller's Training in Japan (JCAB HQ)
- (3) CHUBU CENTRAIR International Airport (JCAB)
- (4) Non Radar / Radar Control Operation (JCAB)
- (5) AIR TRAFFIC SERVICES IN MONGOLIA (CAAM)

## **2-5 Flight Procedure Design Training Materials in Mongolia**

- (1) Training for PBN
- (2) Training for ILS, Baro-V, and D.Tool
- (3) Design Works on Conceptual Design
- (4) Detailed Design Works with PANADES
- (5) Flight Validation and Preparation of Draft AIP

## **2-6 Workshop Materials**

### **<General>**

- (1) Project on ANS capacity building for NUBIA (28 June 2016)

### **<ATC>**

- (2) Training of ATC Officers (10 Aug 2016)

### **<CNS>**

- (3) Mini Work Shop of CNS Teams (Jun 2016)
- (4) 2nd Mini Work Shop of CNS Teams (5 Aug 2016)
- (5) CNS Division of CAAM (5 Aug 2016)
- (6) CNS Workshop-3, In response to the questions from CNS Engineers (11 Nov 2016)
- (7) CNS Workshop-5, MLAT, WAM, Future Surveillance Plan (Jul 2017)
- (8) Operation- Maintenance manual of Japan's Airport lights - Power facility (Aug 2016)
- (9) JCAB's Aeronautical Lighting System cooperation for NUBIA (Aug 2016)
- (10) Airport lights (Aug 2016)
- (11) Lighting and electrical technical training in Japan (Aug 2016)
- (12) Introduction and development of LED Aeronautical Ground Lights - RWSL (27 Jul 2017)
- (13) Maintenance and Operation and Management of Aeronautical Lighting System and Electrical Facilities (Jun 2019)

### **<Flight Inspection>**

- (14) Flight Inspection of Japan (Jun 2016)
- (15) Introduction Flight Inspection of Japan (Nov 2016)
- (16) Why do Flight Inspection (Apr 2017)
- (17) Workshop About Nav. Facility Inspection Procedure up to the opening of NUBIA (Dec 2017)
- (18) Workshop, On AIP Notice of Flight Insp. Result (Collaboration FIPDS, CNS, AIS in CAAM) (Dec 2017)
- (19) Workshop, PREPARATIONS FOR AIP PUBLIC NOTICE FOR OPENING OF NUBIA (AIS, CAMM) (12 Dec 2017)

## **2-7 NUBIA Opening Reports by JICA Experts**

- (1) Day by Day implementation Report for NUBIA Opening

## **2-8 WEB Meeting Records between CAAM and JICA Experts**

- (1) Consideration List for WEB Meeting (25 Mar 2020)
- (2) Consideration List for WEB Meeting (1 Apr 2020)
- (3) Consideration List for WEB Meeting (8 Apr 2020)
- (4) Consideration List for WEB Meeting (16 Apr 2020)
- (5) Consideration List for WEB Meeting (23 Apr 2020)
- (6) Consideration List for WEB Meeting (30 Apr 2020)
- (7) Consideration List for WEB Meeting (6 May 2020)



- (8) Consideration List for WEB Meeting (13 May 2020)
- (9) Consideration List for WEB Meeting (21 May 2020)
- (10) Consideration List for WEB Meeting (27 May 2020)
- (11) Consideration List for WEB Meeting (3 Jun 2020)
- (12) Consideration List for WEB Meeting (11 Jun 2020)
- (13) Consideration List for WEB Meeting (18 Jun 2020)
- (14) Consideration List for WEB Meeting (22 Jun 2020)
- (15) Consideration List for WEB Meeting (30 Jun 2020)
- (16) Consideration List for WEB Meeting (22 Jul 2020)
- (17) Consideration List for WEB Meeting (29 Jul 2020)
- (18) Consideration List for WEB Meeting (5 Aug 2020)
- (19) Consideration List for WEB Meeting (12 Aug 2020)
- (20) Consideration List for WEB Meeting (19 Aug 2020)
- (21) Consideration List for WEB Meeting (26 Aug 2020)
- (22) Consideration List for WEB Meeting (3 Sep 2020)
- (23) Consideration List for WEB Meeting (9 Sep 2020)
- (24) Consideration List for WEB Meeting (16 Sep 2020)
- (25) Consideration List for WEB Meeting (25 Sep 2020)
- (26) Consideration List for WEB Meeting (27 Oct 2020)
- (27) Consideration List for WEB Meeting (23 Dec 2020)
- (28) Consideration List for WEB Meeting (20 Jan 2021)
- (29) Consideration List for WEB Meeting (26 Feb 2021)
- (30) Consideration List for WEB Meeting (18 Mar 2021)
- (31) Consideration List for WEB Meeting (15 Apr 2021)
- (32) Consideration List for WEB Meeting (14 May 2021)
- (33) Consideration List for WEB Meeting (24 May 2021)
- (34) Consideration List for WEB Meeting (4 Jun 2021)
- (35) Consideration List for WEB Meeting (11 Jun 2021)
- (36) Consideration List for WEB Meeting (18 Jun 2021)
- (37) Consideration List for WEB Meeting (23 Jun 2021)
- (38) Consideration List for WEB Meeting (30 Jun 2021)
- (39) Consideration List for WEB Meeting (9 Jul 2021)
- (40) Consideration List for WEB Meeting (20 Jul 2021)
- (41) Consideration List for WEB Meeting (3 Aug 2021)

## **2-9 Memorandums of Wrap-up Meetings of JICA Experts Dispatches**

- (1) Memorandum of ANS Pre-Operation Work (1st Dispatch) (28 Jun 2016)
- (2) Memorandum of ANS Pre-Operation Work (2nd Dispatch) (19 Aug 2016)
- (3) Memorandum of ANS Pre-Operation Work (4th Dispatch) (10 Nov 2016)

- (4) Memorandum of ANS Pre-Operation Work (6th Dispatch) (22 Dec 2016)
- (5) Memorandum of ANS Pre-Operation Work (7th Dispatch) (16 Mar 2017)
- (6) Memorandum of ANS Pre-Operation Work (8th Dispatch) (27 Apr 2017)
- (7) Memorandum of ANS Pre-Operation Work (9th Dispatch) (6 Jul 2017)
- (8) Memorandum of ANS Pre-Operation Work (10th Dispatch) (4 Aug 2017)
- (9) Memorandum of ANS Pre-Operation Work (11th Dispatch) (15 Dec 2017)
- (10) Memorandum of ANS Pre-Operation Work (12th Dispatch) (18 Jan 2018)
- (11) Memorandum of ANS Pre-Operation Work (13th Dispatch) (26 Apr 2018)
- (12) Memorandum of ANS Pre-Operation Work (14th Dispatch) (31 Aug 2018)
- (13) Memorandum of ANS Pre-Operation Work (15th Dispatch) (7 Dec 2018)
- (14) Memorandum of ANS Pre-Operation Work (16th Dispatch) (14 Jun 2019)
- (15) Memorandum of ANS Pre-Operation Work (17th Dispatch) (5 Jul 2019)
- (16) Memorandum of ANS Pre-Operation Work (18th Dispatch) (5 Nov 2019)
- (17) Memorandum of ANS Pre-Operation Work (19th Dispatch) (6 Dec 2019)
- (18) Memorandum of ANS Pre-Operation Work (20th Dispatch) (17 Jan 2020)
- (19) Memorandum of ANS Pre-Operation Work (21st Dispatch) (21 Feb 2020)
- (20) Memorandum of ANS Pre-Operation Work (22nd Dispatch) (13 Sep 2021)



# Annex 3: PDM

## 1. PDM ver. 1 (26 September 2014)

Project Design Matrix (Draft)

Project for Human Resource Development and O&M Capacity Development for New Ulaanbaatar International Airport (NUBIA)

Annex 1

Implementing Entity: Ministry of Roads, Transportation (MRT)

Project Implementation Period: From 12/2014-31/7/2017 (32 months)

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumption
<b>Overall Goal</b> NUBIA the capital airport of Mongolia is upgraded in its capacity to be able to function appropriately in case of rapid increase of customers as the gateway of the country.	1. NUBIA is installed with the capacity to handle annual demand of passengers of approximately two (2) million properly. 2. Convenience of stakeholders, such as airlines using NUBIA, is increased.	1. Data on operation results accumulated by CAAM 2. Questionnaire survey to stakeholders 3. Interviews with customers 4. Number of airlines using NUBIA 5. Comparison of non-airautical revenues, e.g. food and drinks, and goods sales, between that of Chinggis Khaan International Airport	
<b>Project Purpose</b> Mechanism as well as capacity for O&M are strengthened in NUBIA for its smooth inauguration.	1. O&M organization of NUBIA is appropriately functioning by implementing the O&M organization plan. 2. Most of preparatory work is completed in the field of maintenance of runways, etc. along with the revised maintenance plan for NUBIA. 3. Most of preparatory work is completed in the field of fuel supply system along with O&M plan for NUBIA. 4. Most of preparatory work is completed in the field of tenant management along with the O&M plan for NUBIA with charge which is appropriately set for NUBIA. 5. Most of preparatory work is completed in the field of customer satisfaction (CS) improvement along with the plan for NUBIA. 6. Most of preparatory work is completed for relocation to NUBIA.	1. Structured interviews with C/Ps 2. Project report 3. Evaluation by Japanese expert 4. Self evaluation by C/Ps	1. Construction of access road to NUBIA, administration building, cargo terminal, waste treatment facilities, etc. is completed before the commissioning of NUBIA by the Mongolian side. 2. Staff training for human resource development is continuously carried out for NUBIA personnel by the Mongolian side. 3. Necessary procedures are smoothly taken by the competent authorities, esp. Ministry of Road and Transportation (MRT), on the establishment of O&M organization.
<b>Output</b>			
1. O&M organization is established based on O&M organization plan including staff allocation.	1-1 C/Ps' knowledge on O&M organization is increased. 1-2 Regulations, manual, etc. for O&M organization at NUBIA are prepared. 1-3 Organizational chart is prepared for NUBIA.	1. O&M organization plan including staff allocation 2. Project report 3. Evaluation by Japanese expert 4. Self evaluation by C/Ps	
2. Implementation capacity for revised maintenance plan of runways, etc. at NUBIA is improved.	2-1 C/Ps' knowledge on maintenance of runway, etc. is increased. 2-2 Regulations, manual, etc. for maintenance of runway, etc. at NUBIA are prepared. 2-3 Maintenance plan of runway, etc. at NUBIA is documented. 2-4 Staff are well educated on maintenance of runway, etc.	1. Revised maintenance plan of Runways, etc. 2. Project report 3. Evaluation by Japanese expert 4. Self evaluation by C/Ps	1. Laws and regulations concerning establishment of O&M organization are sufficiently consistent. 2. Necessary number of staff are assigned to O&M of NUBIA and continuously work on O&M activities.
3. Implementation capacity for newly developed O&M plan of fuel supply at NUBIA is improved.	3-1 C/Ps' knowledge on O&M of fuel supply system is increased. 3-2 Regulations, manual, etc. for O&M of fuel supply system at NUBIA are prepared. 3-3 O&M plan for O&M of fuel supply system at NUBIA is documented. 3-4 Staff are well educated on O&M of fuel supply system.	1. O&M plan on fuel supply system 2. Project report 3. Evaluation by Japanese expert 4. Self evaluation by C/Ps	
4. Implementation capacity for newly established charge setting system and tenant management plan at NUBIA is improved.	4-1 C/Ps' knowledge on charge setting methods and tenant management is increased. 4-2 Appropriate charge system is installed at NUBIA. 4-3 Regulations, manual, etc. for tenant management at NUBIA are prepared.	1. Charge system 2. Tenant management plan 3. Project report 4. Evaluation by Japanese expert 5. Self evaluation by C/Ps	
5. Implementation capacity for newly developed customer satisfaction (CS) plan for upgrading CS at NUBIA is improved.	5-1 C/Ps' knowledge on CS is increased. 5-2 Regulations, manual, activities for upgrading customer satisfaction (CS) at NUBIA are prepared. 5-3 Staff are well educated on CS improvement.	1. Operation plan for customer satisfaction (CS) 2. Project report 3. Evaluation by Japanese expert 4. Self evaluation by C/Ps	
6. Implementation capacity for newly developed relocation master plan is improved.	6-1 C/Ps have deepen their understanding on necessary activities for preparation for airport relocation. 6-2 Staff and other necessary resources are appropriately allocated for airport relocation.	1. Relocation master plan 2. Project report 3. Evaluation by Japanese expert 4. Self evaluation by C/Ps	
<b>Activities</b>	<b>Input</b>	<b>Important Assumption</b>	
1-1 Review the present situation of O&M at Chinggis Khaan International Airport 1-2 Explain the O&M mechanism as well as activities taken in Japanese airport(s) with some field visits 1-3 Support the implementation of Action Plan for establishing O&M organization at NUBIA (including staff allocation) 1-4 Provide training on airport operation  2-1 Review the present situation of maintenance of runway, etc. at Chinggis Khaan International Airport. 2-2 Explain the O&M mechanism as well as activities taken in Japanese airport(s) in the field of maintenance of runway, etc. with some field visits. 2-3 Support the implementation of Action Plan for maintenance of runway, etc. at NUBIA. 2-4 Provide training in some priority fields in maintenance of runways, etc.  3-1 Review the present situation of O&M of fuel supply system at Chinggis Khaan International Airport. 3-2 Explain the O&M mechanism as well as activities taken in Japanese airport(s) in the field of fuel supply system with some field visits. 3-3 Support the implementation of Action Plan for O&M in the field of fuel supply system at NUBIA. 3-4 Provide training in some priority fields in O&M of fuel supply system.  4-1 Review the present situation of operation as well as profitability of Chinggis Khaan International Airport. 4-2 Explain the charge setting methods as well as tenant management taken in Japanese airport(s) with some field visits. 4-3 Support the implementation of Action Plan for charge setting at NUBIA. 4-4 Support the implementation of Action Plan for tenant management at NUBIA. 4-5 Provide training on tenant management.  5-1 Review the present situation of customer services at Chinggis Khaan International Airport. 5-2 Explain the mechanism as well as activities taken in Japanese airport(s) in the field of customer satisfaction (CS) improvement with some field visits. 5-3 Support the implementation of Action Plan for customer satisfaction (CS) improvement. 5-4 Provide training on customer satisfaction (CS) improvement.  6-1 Review the procedures as well as the progress of preparation for start up and commissioning of NUBIA. 6-2 Explain the method as well as the activities taken in Japanese airport(s) in the field of airport relocation. 6-3 Support the implementation of Action Plan for airport relocation to NUBIA.	Japanese side  1. Dispatch of Japanese Experts  <i>Fields of Experts</i> - Organization planning / Airport operation - Airport facilities O&M planning  - Pavement - Fuel supply system - Charge setting - Tenant management - Customer satisfaction (CS) improvement  - Airport relocation - Coordinator  2. Training in Japan  <i>Fields of Trainers</i> Organization planning / Airport operation, Airport facilities O&M planning, Pavement, fuel supply system, Tenant management, Customer satisfaction (CS) improvement  3. Equipment  <i>In case of necessity, of description</i>  4. Cost  Project assistant / interpreter	Mongolian side  1. Assignment of Counterpart Personnel (C/P)  ① Steering Committee for O&M (at management level) As the responsible organization for decision-making ② O&M Team (at administration level)  - Organization planning / Airport operation - Airport facilities O&M planning - Pavement - Fuel supply system - Charge setting - Tenant management - Customer satisfaction (CS) improvement - Airport relocation  ③ Selection of trainees  2. Provision of facilities for the Project implementation  - Office space - Office facilities etc.  3. Equipment  Necessary equipment for the Project implementation  4. Local cost  - Cost for office space facilities (including for electricity, water, telephone & communication, etc.) - Others (Survey, etc.)	<b>Preconditions</b>  1. The organizations found below are officially established in Mongolia, before the Project starts. ① Steering Committee for O&M (at management level) ② O&M Team (at administrative level)  2. Budget for the Project implementation is properly allocated by the Mongolian side, before the Project starts. 3. Necessary facilities/equipment for the Project implementation are properly provided by the Mongolian side, before the Project starts.

## 2. PDM ver. 2 (22 April 2016)

### Annex3: Project Design Matrix (PDM) with Additional Activities on ANS at NUBIA

Project for Human Resource Development and O&M Capacity Development for New Ulaanbaatar International Airport (NUBIA)

Implementing Entity: Ministry of Roads, Transportation (MRT)

Version No.2 Dated on April 2016

Target Group : NUBIA Pre-Operation Division, O&M Team, ANS-WG

Project Implementation Period: From 12/2014-31/07/2017 (32 months)

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumption
<b>Overall Goal</b> NUBIA, the capital airport of Mongolia, is upgraded in its capacity to be able to function appropriately in case of rapid increase of customers as the gateway of the country.	1. NUBIA is installed with the capacity to handle annual demand of passengers of approximately two (2) million properly. 2. Convenience of stakeholders, such as airlines using NUBIA, is increased.	1. Data on operation results accumulated by CAAM 2. Questionnaire survey to stakeholders 3. Interviews with customers 4. Number of airlines using NUBIA 5. Comparison of non-aeronautical revenue, e.g. food and drinks, and goods sales, between that of Chinggis Khaan International Airport and NUBIA	
<b>Project Purpose</b> Mechanism as well as capacity for O&M is strengthened in NUBIA for its smooth inauguration.	In accordance with the To Do List, the works 1-6 listed below are completed for inauguration: 1. O&M organization of NUBIA is established and starts functioning. 2. Preparatory work in the field of maintenance of runways, etc. along with the revised maintenance plan for NUBIA. 3. Preparatory work in the field of fuel supply system along with O&M plan for NUBIA. 4. Preparatory work in the field of tenant management for NUBIA along with the O&M plan for NUBIA including appropriate charges. 5. Preparatory work in the field of customer satisfaction (CS) improvement along with the O&M plan for NUBIA. 6. Preparatory work for relocation to NUBIA. 7. Preparatory work for provision of Air Navigation services at NUBIA is completed in accordance with Pre-operation Plan	1. Structured interviews with C/Ps 2. Project report 3. Evaluation by Japanese experts 4. Self-evaluation by C/Ps	1. Construction of access road to NUBIA, administration building, cargo terminal, waste treatment facilities, etc. is completed before the commissioning of NUBIA by the Mongolian side. 2. Staff training for human resource development is continuously carried out for NUBIA personnel by the Mongolian side. 3. Necessary procedures are smoothly taken by the competent authorities, esp. Ministry of Road and Transportation (MRT), on the establishment of O&M organization.
<b>Output</b>			
1. O&M organization is established based on O&M plan including staff allocation.	In accordance with the To Do List, 1-1 C/Ps' knowledge on O&M organization is increased. 1-2 Regulations, manual, etc. for O&M organization at NUBIA are prepared. 1-3 Organizational chart is prepared for NUBIA. 1-4 Staff are allocated and meet the quota	1. O&M organization plan including staff allocation 2. Project report 3. Evaluation by Japanese expert 4. Self-evaluation by C/Ps 5. Check List of the To Do List	1. Laws and regulations concerning establishment of O&M organization are sufficiently consistent 2. Necessary number of staff are assigned to O&M of NUBIA and continuously work on O&M activities.
2. Implementation capacity for revised maintenance plan of runways etc. at NUBIA is improved.	In accordance with the To Do List, 2-1 C/Ps' knowledge on maintenance of runway, etc. is increased. 2-2 Regulations, manual, etc. for maintenance of runway, etc. at NUBIA are prepared. 2-3 Maintenance plan of runway, etc. at NUBIA is documented. 2-4 Staff are well educated on maintenance of runway, etc.	1. Revised maintenance plan of Runways, etc. 2. Project report 3. Evaluation by Japanese expert 4. Self-evaluation by C/Ps 5. Check List of the To Do List	
3. Implementation capacity for newly developed O&M plan of fuel supply at NUBIA is improved.	In accordance with the To Do List, 3-1 C/Ps' knowledge on O&M of fuel supply system is increased. 3-2 Regulations, manual, etc. for O&M of fuel supply system at NUBIA are prepared. 3-3 O&M plan for O&M of fuel supply system at NUBIA is documented. 3-4 Staff are well educated on O&M of fuel supply system.	1. O&M plan on fuel supply system 2. Project report 3. Evaluation by Japanese expert 4. Self-evaluation by C/Ps 5. Check List of the To Do List	
4. Implementation capacity for newly established charge setting system and tenant management plan at NUBIA is improved.	In accordance with the To Do List, 4-1 C/Ps' knowledge on charge setting methods and tenant management is increased. 4-2 Appropriate charge system is installed at NUBIA. 4-3 Regulations, manual, etc. for tenant management at NUBIA are prepared.	1. Charge system 2. Tenant management plan 3. Project report 4. Evaluation by Japanese expert 5. Self-evaluation by C/Ps 6. Check List of the To Do List	
5. Implementation capacity for newly developed customer satisfaction (CS) plan for upgrading CS at NUBIA is improved.	In accordance with the To Do List, 5-1 C/Ps' knowledge on CS is increased. 5-2 Regulations, manual, activities for upgrading customer satisfaction (CS) at NUBIA are prepared. 5-3 Staff are well educated on CS improvement.	1. Operation plan for customer satisfaction (CS) 2. Project report 3. Evaluation by Japanese expert 4. Self-evaluation by C/Ps 5. Check List of the To Do List	
6. Implementation capacity for newly developed relocation master plan is improved.	In accordance with the To Do List, 6-1 C/Ps have deepened their understanding on necessary activities for preparation for airport relocation. 6-2 Staff and other necessary resources are appropriately allocated for airport relocation.	1. Relocation master plan 2. Project report 3. Evaluation by Japanese expert 4. Self-evaluation by C/Ps 5. Check List of the To Do List	
7. Capacity of CAAM is developed for provision of Air Navigation Services at NUBIA	7-1 Pre-operation Plan is developed, implemented and monitored. 7-2 Opening Day Plan is developed, implemented and monitored 7-3 Safety assessment by CAAM inspectors is completed for ATM and CNS. 7-4 At least 32 officers are rated for ATC at NUBIA. 7-5 At least 25 engineers are capable of maintaining CNS systems at NUBIA. 7-6 At least 6 engineers are capable of conducting flight inspection of IFPs. 7-7 Conventional IFPs for NUBIA are issued in AIP. 7-8 PBN IFPs for NUBIA are issued in AIP.	1. Project report 2. Evaluation by Japanese expert 3. Self-evaluation by C/Ps	

Activities	Inputs		Important Assumption
	Japanese side	Mongolian side	
<p>1-1 Review the present situation of O&amp;M at Chinggis Khaan International Airport</p> <p>1-2 Learn the O&amp;M mechanism as well as activities taken in Japanese airport(s) with some field visits</p> <p>1-3 Implement Action Plan for establishing O&amp;M organization at NUBIA (including staff allocation)</p> <p>1-4 Conduct training on airport operation</p> <p>2-1 Review the present situation of maintenance of runway, etc. at Chinggis Khaan International Airport</p> <p>2-2 Learn the mechanism as well as activities taken in Japanese airport(s) in the field of maintenance of runway, etc. with some field visits.</p> <p>2-3 Implement Action Plan for maintenance of runway, etc. at NUBIA</p> <p>2-4 Conduct training in some priority fields in maintenance of runways, etc.</p> <p>3-1 Review the present situation of O&amp;M of fuel supply system at Chinggis Khaan International Airport</p> <p>3-2 Learn the O&amp;M mechanism as well as activities taken in Japanese airport(s) in the field of fuel supply system with some field visits</p> <p>3-3 Implement Action Plan for O&amp;M in the field of fuel supply system at NUBIA</p> <p>3-4 Conduct training in some priority fields in O&amp;M of fuel supply system</p> <p>4-1 Review the present situation of operation as well as profitability of Chinggis Khaan International Airport</p> <p>4-2 Learn the charge setting methods as well as tenant management taken in Japanese airport(s) with some field visits.</p> <p>4-3 Implement Action Plan for charge setting at NUBIA</p> <p>4-4 Implement Action Plan for tenant management at NUBIA</p> <p>4-5 Conduct training on tenant management</p> <p>5-1 Review the present situation of customer services at Chinggis Khaan International Airport</p> <p>5-2 Learn the mechanism as well as activities taken in Japanese airport(s) in the field of customer satisfaction (CS) improvement with some field visits</p> <p>5-3 Implement Action Plan for customer satisfaction (CS) improvement</p> <p>5-4 Conduct training on customer satisfaction (CS) improvement</p> <p>6-1 Review the procedures as well as the progress of preparation for startup and commissioning of NUBIA</p> <p>6-2 Learn the method as well as the activities taken in Japanese airport(s) in the field of airport relocation</p> <p>6-3 Implement Action Plan for airport relocation to NUBIA</p> <p>7-1 Pre-operation Plan</p> <p>7-1-1 Develop a draft Pre-operation Plan</p> <p>7-1-2 Learn practices of airport/ANS coordination in Japan (including training in Japan)</p> <p>7-1-3 Improve the Pre-operation Plan based on analysis on the draft</p> <p>7-1-4 Monitor progress of the Pre-operation Plan, and adjust if necessary</p> <p>7-2 Opening Day Plan</p> <p>7-2-1 Develop an Opening Day Plan</p> <p>7-2-2 Monitor progress of the Opening Day Plan, and adjust if necessary</p> <p>7-3 Safety Assessment</p> <p>7-3-1 Assess risk and occurrence of unsafe events associated with new services</p> <p>7-3-2 Develop safety measures for critical safety issues</p> <p>7-4 Training of ATC officers</p> <p>7-4-1 Develop training program for ATC officers</p> <p>7-4-2 Develop ATC Operation Procedures</p> <p>7-4-3 Conduct training on ATC Operation Procedures</p> <p>7-4-4 Conduct simulator and test-operation training</p> <p>7-4-5 Develop Rating Standard</p> <p>7-4-6 Implement rating of ATC officers</p> <p>7-5 Training of CNS engineers</p> <p>7-5-1 Develop training program for CNS engineers</p> <p>7-5-2 Develop CNS Maintenance Procedures</p> <p>7-5-3 Conduct training on CNS Maintenance Procedures</p> <p>7-5-4 Conduct On-the-Job Training of CNS engineers</p> <p>7-6 Training of Flight Inspection engineers</p> <p>7-6-1 Develop flight inspection procedures</p> <p>7-6-2 Conduct On-the-Job Training of Flight Inspection engineers</p> <p>7-7 Development of Flight Procedures for NUBIA</p> <p>7-7-1 Design instrument flight procedures (IFPs)</p> <p>7-7-2 Conduct grand validation</p> <p>7-7-3 Conduct flight calibration/validation</p> <p>7-7-4 Production of aeronautical charts for AIP</p>	<p>1. Dispatch of Japanese Experts</p> <p><u>Fields of Experts</u></p> <ul style="list-style-type: none"> <li>- Organization planning / Airport operation</li> <li>- Airport facilities O&amp;M planning</li> <li>- Pavement</li> <li>- Fuel supply system</li> <li>- Charge setting</li> <li>- Tenant management</li> <li>- Customer satisfaction (CS) improvement</li> <li>- Airport relocation</li> <li>- Coordinator</li> <li>- ANS Chief Advisor</li> <li>- ATC Training Expert</li> <li>- CNS Training Expert</li> <li>- Flight Inspection Expert</li> <li>- Flight Procedure Design Expert</li> </ul> <p>2. Training in Japan</p> <p><u>Fields of Training</u></p> <p>Organization planning / Airport operation, Airport facilities O&amp;M planning, Pavement, Fuel supply system, Tenant management, Customer satisfaction (CS) improvement, Management training on airport/ANS coordination for middle-class managers or key persons</p> <p>3. Equipment</p> <p>Automated Flight Procedure Design System (6-month use)</p> <p>4. Cost</p> <p>Project assistant / interpreter</p>	<p>1. Assignment of Counterpart Personnel (C/P)</p> <p>a) Steering Committee for O&amp;M (at management level)</p> <ul style="list-style-type: none"> <li>- As the responsible organization for decision-making</li> </ul> <p>b) O&amp;M Team (at administration level)</p> <ul style="list-style-type: none"> <li>- Organization planning /Airport operation</li> <li>- Airport facilities O&amp;M planning</li> <li>- Pavement</li> <li>- Fuel supply system</li> <li>- Charge setting</li> <li>- Tenant management</li> <li>- Customer satisfaction (CS) improvement</li> <li>- Airport relocation</li> </ul> <p>c) Selection of trainees</p> <p>d) ANS Pre-operation Working Group</p> <ul style="list-style-type: none"> <li>- Pre-operation Planning Team</li> <li>- ATC Training Team</li> <li>- CNS Training Team</li> <li>- Flight Inspection Team</li> <li>- Flight Procedure Design Team</li> </ul> <p>2. Provision of facilities for the Project Implementation</p> <ul style="list-style-type: none"> <li>- Office space</li> <li>- Office facilities etc.</li> </ul> <p>3. Equipment</p> <ul style="list-style-type: none"> <li>- Necessary equipment for the Project implementation</li> <li>- Flight inspection services for CNS equipment and PBN flight procedures</li> <li>- ATC training simulator</li> </ul> <p>4. Local cost</p> <ul style="list-style-type: none"> <li>- Cost for office space/facilities (including for electricity, water, telephone &amp; communication, etc.)</li> <li>- Others (data, information, survey results, etc.)</li> </ul>	<p><u>Preconditions</u></p> <p>1. The organizations found below are officially established in Mongolia, before the Project starts.</p> <p>a) Steering Committee for O&amp;M (at management level)</p> <p>b) O&amp;M Team (at administrative level)</p> <p>2. Budget for the Project implementation is properly allocated by the Mongolian side, before the Project starts.</p> <p>3. Necessary facilities/equipment for the Project implementation are properly provided by the Mongolian side, before the Project starts.</p>

### 3. PDM ver. 3 (7 April 2017)

#### Annex3: Project Design Matrix (PDM) (2<sup>nd</sup> Amended)

Project for Human Resource Development and O&M Capacity Development for New Ulaanbaatar International Airport (NUBIA)

Implementing Entity: Ministry of Road and Transport Development (MRTD)

Version No.3 Dated on March 2017

Target Group : NUBIA Pre-Operation Administration (POA), ANS-Pre-Operation WG and PIU Project Implementation Period: 28/1/2015-27/07/2018 (42 months)

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumption
<b>Overall Goal</b> NUBIA, the capital airport of Mongolia, is upgraded in its capacity to be able to function appropriately in case of rapid increase of customers as the gateway of the country.	1. NUBIA is installed with the capacity to handle annual demand of passengers of approximately two (2) million properly. 2. Convenience of stakeholders, such as airlines using NUBIA, is increased.	1. Data on operation results accumulated by CAAM 2. Questionnaire survey to stakeholders 3. Interviews with customers 4. Number of airlines using NUBIA 5. Comparison of non-aeronautical revenue, e.g. food and drinks, and goods sales, between that of Chinggis Khaan International Airport and NUBIA	
<b>Project Purpose</b> Mechanism as well as capacity for O&M is strengthened in NUBIA for its smooth inauguration.	In accordance with the To Do List, the works 1-6 listed below are completed for inauguration: 1. O&M organization of NUBIA is established and starts functioning. 2. Preparatory work in the field of maintenance of runways, etc. along with the revised maintenance plan for NUBIA. 3. Preparatory work in the field of fuel supply system along with O&M plan for NUBIA. 4. Preparatory work in the field of tenant management for NUBIA along with the O&M plan for NUBIA including appropriate charges. 5. Preparatory work in the field of customer satisfaction (CS) improvement along with the O&M plan for NUBIA. 6. Preparatory work for relocation to NUBIA. 7. Preparatory work for provision of Air Navigation services at NUBIA is completed in accordance with Pre-operation Plan	1. Structured interviews with C/Ps 2. Project report 3. Evaluation by Japanese experts 4. Self-evaluation by C/Ps	1. Construction of access road to NUBIA, administration building, cargo terminal, waste treatment facilities, etc. is completed before the commissioning of NUBIA by the Mongolian side. 2. Staff training for human resource development is continuously carried out for NUBIA personnel by the Mongolian side. 3. Necessary procedures are smoothly taken by the competent authorities, esp. Ministry of Road and Transportation (MRT), on the establishment of O&M organization.
<b>Output</b>			
1. O&M organization is established based on O&M plan including staff allocation.	In accordance with the To Do List, 1-1 C/Ps' knowledge on O&M organization is increased. 1-2 Regulations, manual, etc. for O&M organization at NUBIA are prepared. 1-3 Organizational chart is prepared for NUBIA. 1-4 Staff are allocated and meet the quota	1. O&M organization plan including staff allocation 2. Project report 3. Evaluation by Japanese expert 4. Self-evaluation by C/Ps 5. Check List of the To Do List	1. Laws and regulations concerning establishment of O&M organization are sufficiently consistent. 2. Necessary number of staff are assigned to O&M of NUBIA and continuously work on O&M activities.
2. Implementation capacity for revised maintenance plan of runways etc. at NUBIA is improved.	In accordance with the To Do List, 2-1 C/Ps' knowledge on maintenance of runway, etc. is increased. 2-2 Regulations, manual, etc. for maintenance of runway, etc. at NUBIA are prepared. 2-3 Maintenance plan of runway, etc. at NUBIA is documented. 2-4 Staff are well educated on maintenance of runway, etc.	1. Revised maintenance plan of Runways, etc. 2. Project report 3. Evaluation by Japanese expert 4. Self-evaluation by C/Ps 5. Check List of the To Do List	
3. Implementation capacity for newly developed O&M plan of fuel supply at NUBIA is improved.	In accordance with the To Do List, 3-1 C/Ps' knowledge on O&M of fuel supply system is increased. 3-2 Regulations, manual, etc. for O&M of fuel supply system at NUBIA are prepared. 3-3 O&M plan for O&M of fuel supply system at NUBIA is documented. 3-4 Staff are well educated on O&M of fuel supply system.	1. O&M plan on fuel supply system 2. Project report 3. Evaluation by Japanese expert 4. Self-evaluation by C/Ps 5. Check List of the To Do List	
4. Implementation capacity for newly established charge setting system and tenant management plan at NUBIA is improved.	In accordance with the To Do List, 4-1 C/Ps' knowledge on charge setting methods and tenant management is increased. 4-2 Appropriate charge system is installed at NUBIA. 4-3 Regulations, manual, etc. for tenant management at NUBIA are prepared.	1. Charge system 2. Tenant management plan 3. Project report 4. Evaluation by Japanese expert 5. Self-evaluation by C/Ps 6. Check List of the To Do List	
5. Implementation capacity for newly developed customer satisfaction (CS) plan for upgrading CS at NUBIA is improved.	In accordance with the To Do List, 5-1 C/Ps' knowledge on CS is increased. 5-2 Regulations, manual, activities for upgrading customer satisfaction (CS) at NUBIA are prepared. 5-3 Staff are well educated on CS improvement.	1. Operation plan for customer satisfaction (CS) 2. Project report 3. Evaluation by Japanese expert 4. Self-evaluation by C/Ps 5. Check List of the To Do List	
6. Implementation capacity for newly developed relocation master plan is improved.	In accordance with the To Do List, 6-1 C/Ps have deepened their understanding on necessary activities for preparation for airport relocation. 6-2 Staff and other necessary resources are appropriately allocated for airport relocation.	1. Relocation master plan 2. Project report 3. Evaluation by Japanese expert 4. Self-evaluation by C/Ps 5. Check List of the To Do List	
7. Capacity of CAAM is developed for provision of Air Navigation Services at NUBIA	7-1 Pre-operation Plan is developed, implemented and monitored. 7-2 Opening Day Plan is developed, implemented and monitored 7-3 Safety assessment by CAAM inspectors is completed for ATM and CNS. 7-4 At least 32 officers are rated for ATC at NUBIA. 7-5 At least 26 engineers are capable of maintaining CNS systems at NUBIA. 7-6 At least 6 engineers are capable of conducting flight inspection of IFPs. 7-7 Conventional IFPs for NUBIA are issued in AIP. 7-8 PBN IFPs for NUBIA are issued in AIP.	1. Project report 2. Evaluation by Japanese expert 3. Self-evaluation by C/Ps	

Activities	Inputs		Important Assumption
	Japanese side	Mongolian side	
1-1 Review the present situation of O&M at Chinggis Khaan International Airport 1-2 Learn the O&M mechanism as well as activities taken in Japanese airport(s) with some field visits 1-3 Implement Action Plan for establishing O&M organization at NUBIA (including staff allocation) 1-4 Conduct training on airport operation  2-1 Review the present situation of maintenance of runway, etc. at Chinggis Khaan International Airport 2-2 Learn the mechanism as well as activities taken in Japanese airport(s) in the field of maintenance of runway, etc. with some field visits 2-3 Implement Action Plan for maintenance of runway, etc. at NUBIA 2-4 Conduct training in some priority fields in maintenance of runways, etc.  3-1 Review the present situation of O&M of fuel supply system at Chinggis Khaan International Airport 3-2 Learn the O&M mechanism as well as activities taken in Japanese airport(s) in the field of fuel supply system with some field visits 3-3 Implement Action Plan for O&M in the field of fuel supply system at NUBIA 3-4 Conduct training in some priority fields in O&M of fuel supply system  4-1 Review the present situation of operation as well as profitability of Chinggis Khaan International Airport 4-2 Learn the charge setting methods as well as tenant management taken in Japanese airport(s) with some field visits. 4-3 Implement Action Plan for charge setting at NUBIA 4-4 Implement Action Plan for tenant management at NUBIA 4-5 Conduct training on tenant management  5-1 Review the present situation of customer services at Chinggis Khaan International Airport 5-2 Learn the mechanism as well as activities taken in Japanese airport(s) in the field of customer satisfaction (CS) improvement with some field visits 5-3 Implement Action Plan for customer satisfaction (CS) improvement 5-4 Conduct training on customer satisfaction (CS) improvement  6-1 Review the procedures as well as the progress of preparation for startup and commissioning of NUBIA 6-2 Learn the method as well as the activities taken in Japanese airport(s) in the field of airport relocation 6-3 Implement Action Plan for airport relocation to NUBIA  7-1 Pre-operation Plan 7-1-1 Develop a draft Pre-operation Plan 7-1-2 Learn practices of airport/ANS coordination in Japan (including training in Japan) 7-1-3 Improve the Pre-operation Plan based on analysis on the draft 7-1-4 Monitor progress of the Pre-operation Plan, and adjust if necessary 7-2 Opening Day Plan 7-2-1 Develop an Opening Day Plan 7-2-2 Monitor progress of the Opening Day Plan, and adjust if necessary 7-3 Safety Assessment 7-3-1 Assess risk and occurrence of unsafe events associated with new services 7-3-2 Develop safety measures for critical safety issues 7-4 Training of ATC officers 7-4-1 Develop training program for ATC officers 7-4-2 Develop ATC Operation Procedures 7-4-3 Conduct training on ATC Operation Procedures 7-4-4 Conduct simulator and test-operation training 7-4-5 Develop Rating Standard 7-4-6 Implement rating of ATC officers 7-5 Training of CNS engineers 7-5-1 Develop training program for CNS engineers 7-5-2 Develop CNS Maintenance Procedures 7-5-3 Conduct training on CNS Maintenance Procedures 7-5-4 Conduct On-the-Job Training of CNS engineers 7-5-5 Develop Tentative CNS Maintenance Procedures 7-5-6 Implement Tentative CNS Maintenance at NUBIA 7-6 Training of Flight Inspection engineers 7-6-1 Develop flight inspection procedures 7-6-2 Conduct On-the-Job Training of Flight Inspection engineers 7-7 Development of Flight Procedures for NUBIA 7-7-1 Design instrument flight procedures (IFPs) 7-7-2 Conduct grand validation 7-7-3 Conduct flight calibration/validation 7-7-4 Production of aeronautical charts for AIP	1. Dispatch of Japanese Experts <u>Fields of Experts</u> - Organization planning / Airport operation - Airport facilities O&M planning - Pavement - Fuel supply system - Charge setting - Tenant management - Customer satisfaction (CS) improvement - Airport relocation - Coordinator - ANS Chief Advisor - ATC Training Expert - CNS Training Expert - Flight Inspection Expert - Flight Procedure Design Expert  2. Training in Japan <u>Fields of Training</u> Organization planning / Airport operation, Airport facilities O&M planning, Pavement, Fuel supply system, Tenant management, Customer satisfaction (CS) improvement, Management training on airport/ANS coordination for middle-class managers or key persons, ANS on-site practical work training for ATC officers, CNS engineers and Flight Inspection engineers  3. Equipment Automated Flight Procedure Design System (Until end of March, 2018)  4. Cost Project assistant / interpreter	1. Assignment of Counterpart Personnel (C/P) a) Steering Committee for O&M (at management level) - As the responsible organization for decision-making b) O&M Team (at administration level) - Organization planning / Airport operation - Airport facilities O&M planning - Pavement - Fuel supply system - Charge setting - Tenant management - Customer satisfaction (CS) improvement - Airport relocation c) Selection of trainees d) ANS Pre-operation Working Group - Pre-operation Planning Team - ATC Training Team - CNS Training Team - Flight Inspection Team - Flight Procedure Design Team  2. Provision of facilities for the Project implementation - Office space - Office facilities etc.  3. Equipment - Necessary equipment for the Project implementation - Flight inspection services for CNS equipment and PBN flight procedures - ATC training simulator  4. Local cost - Cost for office space/facilities (including for electricity, water, telephone & communication, etc.) - Others (data, information, survey results, etc.)	<u>Preconditions</u> 1. "The organizations found below are officially established in Mongolia, before the Project starts. a) Steering Committee for O&M (at management level) b) O&M Team (at administrative level) 2. "Budget for the Project implementation is properly allocated by the Mongolian side, before the Project starts. 3. Necessary facilities/equipment for the Project implementation are properly provided by the Mongolian side, before the Project starts.



#### 4. PDM ver. 4 (5 June 2018)

##### Annex1: Project Design Matrix (PDM) (3<sup>rd</sup> Amended)

Project for Human Resource Development and O&M Capacity Development for New Ulaanbaatar International Airport (NUBIA)

Implementing Entity: Ministry of Road and Transport Development (MRTD)

Version No.4 Dated on April 2018

Target Group : NUBIA Pre-Operation Administration (POA), ANS-Pre-Operation WG and PIU

Project Implementation Period: 28/1/2015-27/07/2019 (54 months)

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumption
<b>Overall Goal</b> NUBIA, the capital airport of Mongolia, is upgraded in its capacity to be able to function appropriately in case of rapid increase of customers as the gateway of the country.	<ol style="list-style-type: none"> <li>1. NUBIA is installed with the capacity to handle annual demand of passengers of approximately two (2) million properly.</li> <li>2. Convenience of stakeholders, such as airlines using NUBIA, is increased.</li> </ol>	<ol style="list-style-type: none"> <li>1. Data on operation results accumulated by CAAM</li> <li>2. Questionnaire survey to stakeholders</li> <li>3. Interviews with customers</li> <li>4. Number of airlines using NUBIA</li> <li>5. Comparison of non-aeronautical revenue, e.g. food and drinks, and goods sales, between that of Chinggis Khaan International Airport and NUBIA</li> </ol>	
<b>Project Purpose</b> Mechanism as well as capacity for O&M is strengthened in NUBIA for its smooth inauguration.	<p>In accordance with the To Do List, the works 1-6 listed below are completed for inauguration:</p> <ol style="list-style-type: none"> <li>1. O&amp;M organization of NUBIA is established and starts functioning.</li> <li>2. Preparatory work in the field of maintenance of runways, etc. along with the revised maintenance plan for NUBIA.</li> <li>3. Preparatory work in the field of fuel supply system along with O&amp;M plan for NUBIA.</li> <li>4. Preparatory work in the field of tenant management for NUBIA along with the O&amp;M plan for NUBIA including appropriate charges.</li> <li>5. Preparatory work in the field of customer satisfaction (CS) improvement along with the O&amp;M plan for NUBIA.</li> <li>6. Preparatory work for relocation to NUBIA.</li> <li>7. Preparatory work for provision of Air Navigation services at NUBIA is completed in accordance with Pre-operation Plan</li> </ol>	<ol style="list-style-type: none"> <li>1. Structured interviews with C/Ps</li> <li>2. Project report</li> <li>3. Evaluation by Japanese experts</li> <li>4. Self-evaluation by C/Ps</li> </ol>	<ol style="list-style-type: none"> <li>1. Construction of access road to NUBIA, administration building, cargo terminal, waste treatment facilities, etc. is completed before the commissioning of NUBIA by the Mongolian side.</li> <li>2. Staff training for human resource development is continuously carried out for NUBIA personnel by the Mongolian side.</li> <li>3. Necessary procedures are smoothly taken by the competent authorities, esp. Ministry of Road and Transportation (MRT), on the establishment of O&amp;M organization.</li> </ol>
<b>Output</b>			
1. O&M organization is established based on O&M plan including staff allocation.	<p>In accordance with the To Do List,</p> <ol style="list-style-type: none"> <li>1-1 C/Ps' knowledge on O&amp;M organization is increased.</li> <li>1-2 Regulations, manual, etc. for O&amp;M organization at NUBIA are prepared.</li> <li>1-3 Organizational chart is prepared for NUBIA.</li> <li>1-4 Staff are allocated and meet the quota</li> </ol>	<ol style="list-style-type: none"> <li>1. O&amp;M organization plan including staff allocation</li> <li>2. Project report</li> <li>3. Evaluation by Japanese expert</li> <li>4. Self-evaluation by C/Ps</li> <li>5. Check List of the To Do List</li> </ol>	<ol style="list-style-type: none"> <li>1. Laws and regulations concerning establishment of O&amp;M organization are sufficiently consistent.</li> <li>2. Necessary number of staff are assigned to O&amp;M of NUBIA and continuously work on O&amp;M activities.</li> </ol>
2. Implementation capacity for revised maintenance plan of runways etc. at NUBIA is improved.	<p>In accordance with the To Do List,</p> <ol style="list-style-type: none"> <li>2-1 C/Ps' knowledge on maintenance of runway, etc. is increased.</li> <li>2-2 Regulations, manual, etc. for maintenance of runway, etc. at NUBIA are prepared.</li> <li>2-3 Maintenance plan of runway, etc. at NUBIA is documented.</li> <li>2-4 Staff are well educated on maintenance of runway, etc.</li> </ol>	<ol style="list-style-type: none"> <li>1. Revised maintenance plan of Runways, etc.</li> <li>2. Project report</li> <li>3. Evaluation by Japanese expert</li> <li>4. Self-evaluation by C/Ps</li> <li>5. Check List of the To Do List</li> </ol>	
3. Implementation capacity for newly developed O&M plan of fuel supply at NUBIA is improved.	<p>In accordance with the To Do List,</p> <ol style="list-style-type: none"> <li>3-1 C/Ps' knowledge on O&amp;M of fuel supply system is increased.</li> <li>3-2 Regulations, manual, etc. for O&amp;M of fuel supply system at NUBIA are prepared.</li> <li>3-3 O&amp;M plan for O&amp;M of fuel supply system at NUBIA is documented.</li> <li>3-4 Staff are well educated on O&amp;M of fuel supply system.</li> </ol>	<ol style="list-style-type: none"> <li>1. O&amp;M plan on fuel supply system</li> <li>2. Project report</li> <li>3. Evaluation by Japanese expert</li> <li>4. Self-evaluation by C/Ps</li> <li>5. Check List of the To Do List</li> </ol>	
4. Implementation capacity for newly established charge setting system and tenant management plan at NUBIA is improved.	<p>In accordance with the To Do List,</p> <ol style="list-style-type: none"> <li>4-1 C/Ps' knowledge on charge setting methods and tenant management is increased.</li> <li>4-2 Appropriate charge system is installed at NUBIA.</li> <li>4-3 Regulations, manual, etc. for tenant management at NUBIA are prepared.</li> </ol>	<ol style="list-style-type: none"> <li>1. Charge system</li> <li>2. Tenant management plan</li> <li>3. Project report</li> <li>4. Evaluation by Japanese expert</li> <li>5. Self-evaluation by C/Ps</li> <li>6. Check List of the To Do List</li> </ol>	
5. Implementation capacity for newly developed customer satisfaction (CS) plan for upgrading CS at NUBIA is improved.	<p>In accordance with the To Do List,</p> <ol style="list-style-type: none"> <li>5-1 C/Ps' knowledge on CS is increased.</li> <li>5-2 Regulations, manual, activities for upgrading customer satisfaction (CS) at NUBIA are prepared</li> <li>5-3 Staff are well educated on CS improvement.</li> </ol>	<ol style="list-style-type: none"> <li>1. Operation plan for customer satisfaction (CS)</li> <li>2. Project report</li> <li>3. Evaluation by Japanese expert</li> <li>4. Self-evaluation by C/Ps</li> <li>5. Check List of the To Do List</li> </ol>	
6. Implementation capacity for newly developed relocation master plan is improved.	<p>In accordance with the To Do List,</p> <ol style="list-style-type: none"> <li>6-1 C/Ps have deepened their understanding on necessary activities for preparation for airport relocation.</li> <li>6-2 Staff and other necessary resources are appropriately allocated for airport relocation.</li> </ol>	<ol style="list-style-type: none"> <li>1. Relocation master plan</li> <li>2. Project report</li> <li>3. Evaluation by Japanese expert</li> <li>4. Self-evaluation by C/Ps</li> <li>5. Check List of the To Do List</li> </ol>	
7. Capacity of CAAM is developed for provision of Air Navigation Services at NUBIA	<ol style="list-style-type: none"> <li>7-1 Pre-operation Plan is developed, implemented and monitored.</li> <li>7-2 Opening Day Plan is developed, implemented and monitored</li> <li>7-3 Safety assessment by CAAM inspectors is completed for ATM and CNS.</li> <li>7-4 At least 32 officers are rated for ATC at NUBIA.</li> <li>7-5 At least 25 engineers are capable of maintaining CNS systems at NUBIA.</li> <li>7-6 At least 6 engineers are capable of conducting flight inspection of IFPs.</li> <li>7-7 Conventional IFPs for NUBIA are issued in AIP.</li> <li>7-8 PBN IFPs for NUBIA are issued in AIP.</li> </ol>	<ol style="list-style-type: none"> <li>1. Project report</li> <li>2. Evaluation by Japanese expert</li> <li>3. Self-evaluation by C/Ps</li> </ol>	

Activities	Inputs		Important Assumption
	Japanese side	Mongolian side	
<p>1-1 Review the present situation of O&amp;M at Chinggis Khaan International Airport</p> <p>1-2 Learn the O&amp;M mechanism as well as activities taken in Japanese airport(s) with some field visits</p> <p>1-3 Implement Action Plan for establishing O&amp;M organization at NUBIA (including staff allocation)</p> <p>1-4 Conduct training on airport operation</p> <p>2-1 Review the present situation of maintenance of runway, etc. at Chinggis Khaan International Airport</p> <p>2-2 Learn the mechanism as well as activities taken in Japanese airport(s) in the field of maintenance of runway, etc. with some field visits.</p> <p>2-3 Implement Action Plan for maintenance of runway, etc. at NUBIA</p> <p>2-4 Conduct training in some priority fields in maintenance of runways, etc.</p> <p>3-1 Review the present situation of O&amp;M of fuel supply system at Chinggis Khaan International Airport</p> <p>3-2 Learn the O&amp;M mechanism as well as activities taken in Japanese airport(s) in the field of fuel supply system with some field visits</p> <p>3-3 Implement Action Plan for O&amp;M in the field of fuel supply system at NUBIA</p> <p>3-4 Conduct training in some priority fields in O&amp;M of fuel supply system</p> <p>4-1 Review the present situation of operation as well as profitability of Chinggis Khaan International Airport</p> <p>4-2 Learn the charge setting methods as well as tenant management taken in Japanese airport(s) with some field visits.</p> <p>4-3 Implement Action Plan for charge setting at NUBIA</p> <p>4-4 Implement Action Plan for tenant management at NUBIA</p> <p>4-5 Conduct training on tenant management</p> <p>5-1 Review the present situation of customer services at Chinggis Khaan International Airport</p> <p>5-2 Learn the mechanism as well as activities taken in Japanese airport(s) in the field of customer satisfaction (CS) improvement with some field visits</p> <p>5-3 Implement Action Plan for customer satisfaction (CS) improvement</p> <p>5-4 Conduct training on customer satisfaction (CS) improvement</p> <p>6-1 Review the procedures as well as the progress of preparation for startup and commissioning of NUBIA</p> <p>6-2 Learn the method as well as the activities taken in Japanese airport(s) in the field of airport relocation</p> <p>6-3 Implement Action Plan for airport relocation to NUBIA</p> <p>6-4 Provide overall coordination of airport relocation to NUBIA among related entities</p> <p>7-1 Pre-operation Plan</p> <p>7-1-1 Develop a draft Pre-operation Plan</p> <p>7-1-2 Learn practices of airport/ANS coordination in Japan (including training in Japan)</p> <p>7-1-3 Improve the Pre-operation Plan based on analysis on the draft</p> <p>7-1-4 Monitor progress of the Pre-operation Plan, and adjust if necessary</p> <p>7-2 Opening Day Plan</p> <p>7-2-1 Develop an Opening Day Plan</p> <p>7-2-2 Monitor progress of the Opening Day Plan, and adjust if necessary</p> <p>7-3 Safety Assessment</p> <p>7-3-1 Assess risk and occurrence of unsafe events associated with new services</p> <p>7-3-2 Develop safety measures for critical safety issues</p> <p>7-4 Training of ATC officers</p> <p>7-4-1 Develop training program for ATC officers</p> <p>7-4-2 Develop ATC Operation Procedures</p> <p>7-4-3 Conduct training on ATC Operation Procedures</p> <p>7-4-4 Conduct simulator and test-operation training</p> <p>7-4-5 Develop Rating Standard</p> <p>7-4-6 Implement rating of ATC officers</p> <p>7-5 Training of CNS engineers</p> <p>7-5-1 Develop training program for CNS engineers</p> <p>7-5-2 Develop CNS Maintenance Procedures</p> <p>7-5-3 Conduct training on CNS Maintenance Procedures</p> <p>7-5-4 Conduct On-the-Job Training of CNS engineers</p> <p>7-5-5 Develop Tentative CNS Maintenance Procedures</p> <p>7-5-6 Implement Tentative CNS Maintenance at NUBIA</p> <p>7-6 Training of Flight Inspection engineers</p> <p>7-6-1 Develop flight inspection procedures</p> <p>7-6-2 Conduct On-the-Job Training of Flight Inspection engineers</p> <p>7-7 Development of Flight Procedures for NUBIA</p> <p>7-7-1 Design instrument flight procedures (IFPs)</p> <p>7-7-2 Conduct grand validation</p> <p>7-7-3 Conduct flight calibration/validation</p> <p>7-7-4 Production of aeronautical charts for AIP</p>	<p>1. Dispatch of Japanese Experts</p> <p><u>Fields of Experts</u></p> <ul style="list-style-type: none"> <li>- Organization planning / Airport operation</li> <li>- Airport facilities O&amp;M planning</li> <li>- Pavement</li> <li>- Fuel supply system</li> <li>- Charge setting</li> <li>- Tenant management</li> <li>- Customer satisfaction (CS) improvement</li> <li>- Airport relocation</li> <li>- Coordinator</li> <li>- ANS Chief Advisor</li> <li>- ATC Training Expert</li> <li>- CNS Training Expert</li> <li>- Flight Inspection Expert</li> <li>- Flight Procedure Design Expert</li> </ul> <p>2. Training in Japan</p> <p><u>Fields of Training</u></p> <p>Organization planning / Airport operation, Airport facilities O&amp;M planning, Pavement, Fuel supply system, Tenant management, Customer satisfaction (CS) improvement, Management training on airport/ANS coordination for middle-class managers or key persons, ANS on-site practical work training for ATC officers, CNS engineers and Flight Inspection engineers</p> <p>3. Equipment</p> <p>Automated Flight Procedure Design System (Until end of March 2018)</p> <p>4. Cost</p> <p>Project assistant/interpreter</p>	<p>1. Assignment of Counterpart Personnel (C/P)</p> <p>a) Steering Committee for O&amp;M (at management level)</p> <ul style="list-style-type: none"> <li>- As the responsible organization for decision-making</li> </ul> <p>b) O&amp;M Team (at administration level)</p> <ul style="list-style-type: none"> <li>- Organization planning /Airport operation</li> <li>- Airport facilities O&amp;M planning</li> <li>- Pavement</li> <li>- Fuel supply system</li> <li>- Charge setting</li> <li>- Tenant management</li> <li>- Customer satisfaction (CS) improvement</li> <li>- Airport relocation</li> </ul> <p>c) Selection of trainees</p> <p>d) ANS Pre-operation Working Group</p> <ul style="list-style-type: none"> <li>- Pre-operation Planning Team</li> <li>- ATC Training Team</li> <li>- CNS Training Team</li> <li>- Flight Inspection Team</li> <li>- Flight Procedure Design Team</li> </ul> <p>2. Training abroad</p> <ul style="list-style-type: none"> <li>- ATC training</li> </ul> <p>3. Provision of facilities for the Project implementation</p> <ul style="list-style-type: none"> <li>- Office space</li> <li>- Office facilities etc.</li> </ul> <p>4. Equipment</p> <ul style="list-style-type: none"> <li>- Necessary equipment for the Project implementation</li> <li>- Flight inspection services for CNS equipment and PBN flight procedures</li> </ul> <p>5. Local cost</p> <ul style="list-style-type: none"> <li>- Cost for office space/facilities (including for electricity, water, telephone &amp; communication, etc.)</li> <li>- Others (data, information, survey results, etc.)</li> </ul> <p>6. NUBIA Operator</p> <ul style="list-style-type: none"> <li>- NUBIA operator is established and implement Action Plans for O&amp;M of NUBIA</li> </ul> <p>7. FSS Operator</p> <ul style="list-style-type: none"> <li>- FSS operator of NUBIA is established and implement Action Plan for O&amp;M of FSS</li> </ul>	<p><u>Preconditions</u></p> <p>1. "The organizations found below are officially established in Mongolia, before the Project starts.</p> <p>a) Steering Committee for O&amp;M (at management level)</p> <p>b) O&amp;M Team (at administrative level)</p> <p>2. "Budget for the Project implementation is properly allocated by the Mongolian side, before the Project starts.</p> <p>3. Necessary facilities/equipment for the Project implementation are properly provided by the Mongolian side, before the Project starts.</p>