

Country Name	<b>The Project for Modernization of Equipment for Transition to New CNS/ATM Systems</b>
Lao People's Democratic Republic	

**I. Project Outline**

Background	<p>While the average daily traffic volume of the Vientiane Flight Information Range (FIR) was expected to increase, the air traffic control (ATC) equipment became obsolete and communication range was insufficient. There was no choice but to assume the secured flight interval between aircrafts and there was concern about the lack of ATC capacity with respect to the increase in air demand. In accordance with the high growth of the number of aircrafts taking-off and landing, and passing the Vientiane FIR, proper air traffic management services was recognized imperative in order to improve the ATC capability, ensure safe and efficient aircraft operations. However, the status of the existing ATC and the Nav-aids system in Lao PDR was not sufficiently developed. In order to solve this sort of problems arising all over the world, the International Civil Aviation Organization (ICAO) required the contracting states to introduce a new technology for air traffic management and control, namely the “New CNS/ATM Systems” (New Communications, Navigation, Surveillance and Air Traffic Management Systems). In line with the background above mentioned, JICA implemented the master plan study named “Master Plan Study on the Development of the New CNS/ATM Systems in Cambodia, Lao PDR and Vietnam” in 2009 to formulate an introduction plan for new CNS/ATM systems. A technical cooperation project named “Air Traffic Safety Improvement Project” was also implemented from 2006 to 2009.</p>			
Objectives of the Project	<p>To improve the ATC capability in major airports in Lao PDR by installing air traffic control equipment and human resource capacity development through coordinating with a technical cooperation project, and thereby contributing to increase in airspace capacity and improvement in the safety and efficiency of aircraft operation in Mekong region.</p>			
Contents of the Project	<p>1. Project Site: Vientiane, Luang Phabang, Xieng Khouang (Airport and Rader site), Savannakhet, Pakse and Paksong (Rader site)  2. Japanese side  Major equipment items: AIS (Aeronautical Information Services) Automation System (1 set), VHF Air to Ground Communication for En-route (RCAG) (3 sites), VHF Air to Ground Communication for Aerodrome/Approach/Distress) (5 sites), VSAT System (4 sites), Instrument Landing System (1 set), Flight Procedure Design System (1 set)  3. Lao side:  Improvement of access roads, if necessary.  Site preparation including building construction at Paksong Radar Site, Construction of new control tower at Luang Phabang, Construction of new office building at Pakse, Construction of new RCAG building at Savannakhet, Dismantle, relocation, power feeder and communication line for Equipment</p>			
Project Period	E/N Date	March 26, 2013	Completion Date	January 28, 2015 (Completion of the installation)
	G/A Date	March 29, 2013		
Project Cost	E/N Grant Limit / G/A Grant Limit: : 533 million yen		Actual Grant Amount: 532 million yen	
Executing Agency	Lao Air Traffic Management (LATM)			
Contracted Agencies	Main Contractor(s): Sumitomo Corporation Main Consultant(s): JAPAN AIRPORT CONSULTANTS, INC. NIPPON KOEI CO., LTD			

**II. Result of the Evaluation**

<p><b>I Relevance</b></p> <p>&lt;Consistency with the Development Policy of Lao PDR at the Time of Ex-Ante and Ex-Post Evaluation&gt;</p> <p>The project has been consistent with the development policy of Lao PDR. At the time of ex-ante evaluation, the “7th National Economic Development Plan (NSED) 2011- 2015” mentioned that for development of the aviation sector, it aimed at improving the ability of air traffic management in order to deal with increasing of air traffic demand, and set several concepts including ensuring safety and modernization of ATC. At the time of ex-post evaluation, the “8th National Economic Development Plan (NSED) 2011- 2020” mentioned as one of the target of Outcome1, Output5: Improved Public/Private Labour Force Capacity as bellow; Improve the management of airport systems and facilities to meet the international standards in order to accommodate the growth of domestic and international air transport.</p> <p>&lt;Consistency with the Development Needs of Lao PDR at the Time of Ex-Ante and Ex-Post Evaluation &gt;</p> <p>The project has been consistent with the development needs of Lao PDR for ATC. At the time of ex-ante evaluation, the average growth rate of over flight from 2008 to 2011 was 10% while the number of taking-off and landing showed an average of about 30% as high growth. On the other hand, the status of existing ATC and Nav-aids system in Lao PDR was not sufficiently developed. At the time of ex-post evaluation, the needs for ATC has been high, as the number of over flight aircraft increased form 1,184,000 in 2011 to 2,942,000 in 2017 and the number of departure and approach aircraft at airports increased from 27,800 in 2011 to 45,030 in 2017.</p> <p>&lt;Consistency with Japan’s ODA Policy at the Time of Ex-Ante Evaluation&gt;</p> <p>The project was also consistent with Japan’s ODA Policy to Lao PDR. Under the “Assistant Policy for Lao PDR” (2012), economic and social infrastructure development is one of the priority areas for assistance to Lao PDR.</p> <p>&lt;Evaluation Result&gt;</p>
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In light of the above, the relevance of the project is high.

## 2 Effectiveness/Impact

### <Effectiveness>

The project achieved its objectives, “to improve ATC capability in major airports in Lao PDR”, as a target of an indicator set at the time of ex-ante evaluation of “Reliability of ATC communication channel (%) (cut-off time/operation hours) at Vientiane Area Control Center (ACC)” was achieved. The achievement is mainly from using the VSAT as the backup media during the landline ceased. Qualitatively, it was expected that aircraft longitudinal separation reduces by selecting the efficient route. According to LATM, the southern side route has been shortened from 30 nautical miles (nm) to 20 nm, as the communication between pilot and control tower has been strengthened.

The equipment installed under the project have been utilized well except AIS Automation System. Because of upgrading of other system, namely the Aerospace Message Handling System (AMHS), which was upgraded in 2015, AIS Automation System cannot be compatible to AMHS. LATM have been asking the provider of AMHS to restore, but so far, not successful. LATM has been planning to update AIS to Aeronautical Information Management (AIM) in accordance with the recommendation of ICAO in October 2017 and start operation in 2019.

### <Impact>

Both the number of over flight aircraft and the number of departure and approach aircraft at airports increased after the project was completed. Because of the installation of the new systems under the project, communication capacity of the staff of control tower with pilots has been enhanced, and reliability of safety from airline has also increased. In a survey of ICAO in 2015 April, Laos airports were evaluated safer than Thailand and Cambodia.

No negative impact on natural environment was observed and no land acquisition and resettlement occurred under this project.

### <Evaluation Result>

Therefore, the effectiveness/impact of the project is high.



## Quantitative Effects

	Baseline (2011)	Target (2017) 2 Years after Completion	Actual (2015) Year of Completion	Actual (2017) 2 Years after Completion
Indicator 1: Reliability of ATC communication channel (%) (cut-off time/operation hours) at Vientiane Area Control Center (ACC)	92.6	More than 99.9	More than 99.9	More than 99.9

Source : Questionnaire and interview with LATM

## 3 Efficiency

Although the project cost was as planned (the ratio against the plan: 100%), the project period slightly exceeded the plan (the ratio against the plan: 105%). Therefore, the efficiency of the project is fair.

## 4 Sustainability

### <Institutional Aspect>

O&M of the equipment under the project has been carried out by LATM. The Air Traffic Technical Services Center (Vientiane), the Pakse Air Traffic Management (ATM), the Luangphabang ATM and the Savannakhet ATM have been responsible for the CNS/Meteorological/Back up system maintenance at respective airports. Xieng Khouang airport and Paksong rader site have been under responsibility of Air Traffic Technical Services Center (Vientiane). According to LATM, the number of staff has not been sufficient. Preventive maintenance has not been carried out in some equipment like RCAG, due to the lack of personnel.

### <Technical Aspect>

According to LATM, the technical level of O&M staff at local airports has not been sufficient. The instruction from Vientiane Capital is needed prior the local technicians to take action for VHF Tower and RCAG/VSAT. Due to the insufficient budget, instruction seminar cannot be held regularly. Approximately once a year, a training course has been conducted, but depending on the situation. The training courses include “Basic training for new comers”, “Refresh training for existing staff”, and “Ad-hoc training” when some problem of using equipment are found especially for staffs of provincial airport.

### <Financial Aspect>

According to LATM, the budget of LATM is limited, and the maintenance budget has not been sufficient accordingly.

### Budget of LATM

(Unit: million kips)

Items	2015	2016	2017
Applied budget:	n.a.	n.a.	n.a.
Approved budget	25,353	21,774	n.a.
Budget execution	25,353	21,774	n.a.
(Breakdown) Maintenance and repair	1,133	1,770	1,900

### <Current Status of Operation and Maintenance>

LATM has been carrying out daily and weekly check-up of the equipment, and equipment procured under the project has been in good condition. So far, LATM has only used spare parts the project provided. Future procurement is uncertain due to the budget constraint.

<Evaluation Result>

Therefore, the sustainability of the project effect is fair.

### 5 Summary of the Evaluation

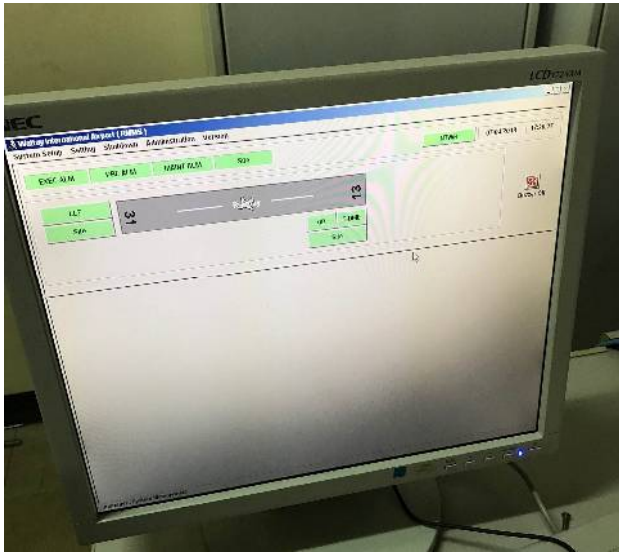
The project achieved its objectives, “to improve the ATC capability in major airports in Lao PDR”, as a target of an indicator set at the time of ex-ante evaluation of “Reliability of ATC communication channel (%) (cut-off time/operation hours) at the Vientiane Area Control Center (ACC)” was achieved. The project contributed to the decrease in aircraft longitudinal separation. Impacts such as increase in over flight aircraft and departure and approach aircraft was observed. As for sustainability, slight problems have been observed in terms of the institutional, technical and financial aspects. As for efficiency, although the project period slightly exceeded the plan, the project cost was as planned.

Considering all of the above points, this project is evaluated to be satisfactory.

### III. Recommendations & Lessons Learned

Recommendations to Executing Agency:

If the executing agency is planning to update systems relating to the Project, pre-consultation with JICA should be done not to cause incompatible. (in this case, if E/A discussed with JICA before the updating the relevant system to AIS, we could escape to stop the AIS system and suggest that the relating system should be update after the upgrade of AIM).



ILS (Instrument Landing System)  
(Wattay International Airport) (Vientiane Capital)



Satellite Modem of each airport