

Federated States of Micronesia

Ex-Post Evaluation of Japanese Grant Aid Project

“The Project for Improvement of Pohnpei International Airport”

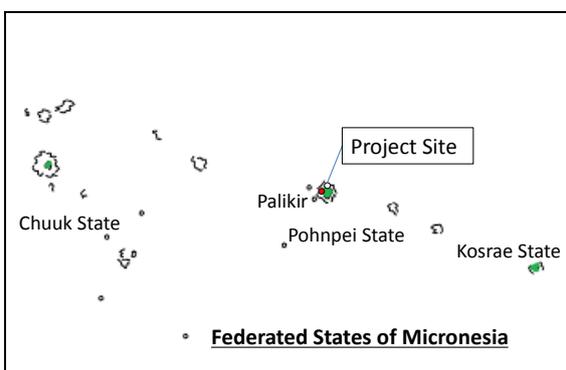
External Evaluator: Keisuke Nishikawa, Japan Economic Research Institute Inc.

## 0. Summary

In this project, a runway was rehabilitated and extended and a terminal building was expanded and renovated to improve the safety of airplanes at the time of takeoff and landing while increasing the capacity of passenger handling. This project was consistent with the development plan and needs of the Federated States of Micronesia (hereinafter referred to as ‘FSM’), as well as the priority areas of Japan’s ODA policy. Therefore, the relevance of this project is high. With regard to project implementation, the project components were implemented mostly as planned and the project cost was within the planned amount. However, the efficiency was judged to be fair as the project period exceeded the plan. With respect to project effectiveness, it was confirmed that the quantitative targets, such as easing of payload and time required for various inspections expected at the time of planning, were mostly achieved, and safety at the time of takeoff and landing, a qualitative effect, also improved. As to the impact of the project, it was confirmed that the stress on pilots during takeoff and landing was reduced, and the service level of the airport was improved. Therefore, the effectiveness and impact of this project are high. Regarding sustainability, there were no particular issues in terms of all institutional, technical and financial aspects, and operation and maintenance status. The project effects generated in this project are considered to be sustained in the future.

In light of the above, this project is evaluated to be highly satisfactory.

## 1. Project Description



Project Location



Runway extended in this project

## **1.1 Background**

The Pohnpei International Airport is the capital airport of FSM and the only airport on Pohnpei Island with a 6,022ft (1,836m)-long runway. But the airport had problems of utmost urgency and importance including the following: facilities related to the runway were not in compliance with safety standards, runway length was not sufficient, and capacity of the passenger terminal building was not sufficient. Specifically, the distance from the end of the runway to the seawall at that time was only about 90ft (29m), and the runway was not equipped with a blast pad (200ft long) and a runway safety area beyond it, though they were required to do so according to the standard of the Federal Aviation Administration (hereinafter referred to as 'FAA'). The runway of 6,022ft was not long enough for takeoff of a B737 with full payload, and a weight restriction was imposed for its operation. Moreover, the apron could not accommodate aircrafts larger than B737-class aircraft. The passenger terminal building did not have sufficient capacity to handle passengers at peak-hour in the departure lounge nor the immigration control area for arrivals, leading to severe congestion.

Based on this background, a request was made by the FSM Government to Japan in 2004 for the development of a study for the improvement of Pohnpei International Airport, and the study was conducted from 2005 to 2006. A mid-term development plan was devised in the study as an airport development master plan, and urgent tasks were extracted as the Urgent Improvement Plan. Responding to this plan, a request for grant aid was submitted to Japan for a runway extension at the Pohnpei International Airport<sup>1</sup> in September 2005. An additional request for expansion of the terminal building was made in March 2006, and it was decided to implement the project.

## **1.2 Project Outline**

The objective of this project is to improve the safety of airplanes at the time of takeoff and landing by rehabilitating and extending the runway and to increase the capacity of passenger handling by expanding and renovating the terminal building.

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<sup>1</sup> The main items requested were as follows: Reclamation for runway extension, Construction of runway, shoulder and turn pad, Expansion of taxiway fillet, Expansion of apron, Installation of airfield lighting (for the extended runway area), procurement of ground service equipment and other miscellaneous works.

Grant Limit / Actual Grant Amount	2,913 million yen / 2,790 million yen
Exchange of Notes Date	September, 2008
Implementing Agency	Department of Transportation, Communication and Infrastructure / Pohnpei Port Authority
Project Completion Date	August, 2011
Main Contractor	Construction: Penta-Ocean Construction Co., Ltd.
Main Consultants	The Consortium of Nippon Koei Co., Ltd. and Japan Airport Consultants, Inc.
Basic Design	January, 2008 (Implementation Review: February, 2009)
Detailed Design	June, 2008 (Detailed Design after Implementation Review: April, 2009)
Related Projects	[Grant Aid] (Preparatory Study) The Preparatory Study on the Improvement of Pohnpei International Airport (FY 2004) (Development Study) The study on the Improvement of Pohnpei International Airport (FY 2005 – 2006) [Other Donors] US Federal Aviation Administration: Rehabilitation of Runway, Taxiway and Apron (2007 – 2011, Grant)

## 2. Outline of the Evaluation Study

### 2.1 External Evaluator

Keisuke Nishikawa (Japan Economic Research Institute Inc.)

### 2.2 Duration of Evaluation Study

This ex-post evaluation study was conducted with the following schedule.

Duration of the Study: October, 2014 – September, 2015

Duration of the Field Study: December 8 – 20, 2014 and March 23 – 26, 2015

### 3. Results of the Evaluation (Overall Rating: A<sup>2</sup>)

#### 3.1 Relevance (Rating: ③<sup>3</sup>)

##### 3.1.1 Relevance to the Development Plan of FSM

Following the revision of the Compact of Free Association<sup>4</sup> with the United States in 2003, FSM formulated the ‘Strategic Development Plan’ (hereinafter referred to as ‘SDP’) in 2004, aiming to achieve stable economic development in the country.

The ‘Infrastructure Development Plan 2004-2023’ (hereinafter referred to as ‘IDP’), formulated based on the SDP, listed an investment plan for infrastructure development in 10 sectors over the following 20 years. The plan included air transportation with investments of 68.4 million dollars, comprising 9% of the entire amount. Regarding airport development in the plan, pavement and rehabilitation of the runway, taxiway, and apron at Pohnpei International Airport were listed as some of the short-term goals for existing facilities, and the extension of the airport’s runway was also listed as a mid to long-term goal.

The above goals had already been set at the time of planning this project. As the SDP and the IDP were both long-term development plans from 2004 to 2023, these priorities remained unchanged at the time of ex-post evaluation, and the aviation sector was positioned as core infrastructure for both points of time in the island nation of FSM. No new overarching plans had been formulated at the national level or the aviation sector level.

Under FSM’s Mori administration, priority areas promoting economic growth were agriculture, fisheries, tourism and energy, and the transportation sector was regarded as key infrastructure underpinning those areas. Therefore, the importance of this project at a policy-level had remained high.

Based on the above, the policy-level importance of the aviation sector in FSM was high and it was confirmed that the sector was positioned as core infrastructure in terms of infrastructure development, both at the time of planning and ex-post evaluation. Therefore, this project can be judged highly consistent with the development plan.

##### 3.1.2 Relevance to the Development Needs of FSM

For the island country of FSM, air transportation is an essential means of transport connecting FSM with neighboring countries as well as the islands of each state scattered

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<sup>2</sup> A: Highly satisfactory, B: Satisfactory, C: Partially satisfactory, D: Unsatisfactory

<sup>3</sup> ③: High, ②: Fair, ①: Low

<sup>4</sup> Compact of Free Association: A bilateral agreement signed between FSM and the United States on political, defense, and economic cooperation. The current agreement will come to an end in 2023, when financial assistance from the United States is expected to be terminated.

within the country. While Pohnpei International Airport is positioned as the capital airport of the country, the distance between the end of the runway and the seawall was shorter than 30m and the blast pad was less than half the length (61m) required by the international standard at the time of planning. In other words, a safety area for any overrun cases at the time of aircraft takeoff and landing was not sufficiently secured. As the runway length was insufficient in this way, there was a need to reduce the loading weight of passengers and cargo by 20% for takeoff and landing of the operating B737s. Regarding the structure of the runway, the central area of the existing runway had continued to subside due to loose ground, but no fundamental improvement was made though temporary measures were taken by overlaying works. Moreover, not only the runway but also the facilities of the terminal building such as the departure lounge, were not large enough for the number passengers the B737s were carrying.

At the time of ex-post evaluation, the ‘Island-hopper’ route<sup>5</sup> connecting Guam, Chuuk State, Pohnpei State, Kosrae State, then Hawaii through the Marshall Islands, was not only indispensable for FSM domestic travelers but served as the only international air route of the nation.

Key air transportation data at Pohnpei International Airport in recent years are shown below.

Table 1: Key Air Transportation Data

(Unit: Number of landing – actual number, Passenger numbers – person, Cargo volume – thousand pounds)

	2008 (Plan)	2009	2010	2011 (Completion)	2012	2013	2014
Number of landing (Passenger plane)	362	366	365	367	367	364	369
Number of landing (Cargo plane)	245	262	131	105	105	106	91
Departing passenger numbers	18,738	19,003	21,136	21,149	20,920	20,115	18,658
Arriving passenger numbers	17,951	18,352	20,909	21,240	19,272	18,923	18,195
Departing cargo volume	3,555	4,344	2,626	1,744	1,194	702	584
Arriving cargo volume	326	201	205	178	202	138	131

Source: Data provided by the Implementing Agency

From Table 1, it can be observed that the numbers for cargo planes and cargo volume have been on a declining trend since the time this project was completed. According to the Implementing Agency, the main reason was the migration in recent years of tuna from fishing grounds around Micronesia to the waters off of the Marshall Islands. On

<sup>5</sup> Operated by the United Airlines

the other hand, while the number of passengers declined slightly over the last few years due to higher air ticket prices, it has stayed around 20,000 annually for both departure and arrival, and it can be said that there has been a generally firm demand for passenger transport.

After the implementation of this project, and while no further development needs had particularly arisen at Pohnpei International Airport through the completion of it, the airport has played a role as a core infrastructural facility both at the time of planning and ex-post evaluation, being the only airport in Pohnpei State not only to enable air travel for people and cargo but also serve as the airport of FSM's capital. In addition, the needs to improve safety such as rehabilitation of the runway including measures against ground settlement and the development of an area for cases of overruns, which were the objectives of this project, was high both at the time of planning and ex-post evaluation, meaning that this project was consistent with the development needs.

### 3.1.3 Relevance to Japan's ODA Policy

In the leader's declaration adopted at the Fourth Japan-Pacific Islands Forum Summit Meeting held in 2006, Japan presented to the Pacific Islands five areas of priority – economic growth, sustainable development, good governance, security, and people-to-people communication and exchange. In light of one of the priorities, 'Economic growth: cooperation in such areas as trade, investment, infrastructure, fisheries and tourism' and the items agreed upon at the Japan-FSM policy consultation in February 2006, Japan prioritized infrastructure development, education, environmental conservation, administrative service function strengthening, and health in its ODA policy for FSM.

This project improved the airport which was the core infrastructure of FSM and was in conformity with the priority area to support infrastructure development. Therefore, this project was highly consistent with Japan's ODA policy at that time.

### 3.1.4 Appropriateness of Project Planning and Approach

This project comprised part of the overall improvement of Pohnpei International Airport, and was implemented almost at the same time as the US-assisted Airport Improvement Program (hereinafter referred to as 'AIP'). As a result of consultations with FSM's Department of Transportation, Communication and Infrastructure, and FAA, development items regarding the runway, apron, airfield lighting, etc., were shared to develop airport facilities with safety as a whole. When the entire airport was checked at the time of ex-post evaluation, no negative influences on project effectiveness were observed and it can be said that role-sharing was appropriately planned.

In this project, it was expected that ground settlement would occur in one part of the extended runway with knowledge of an old existing survey map for seabed topography having been used. As a consequence, subsidence status was monitored for a certain period of time, and the extended runway became open for use in June 2012 after the subsidence stopped. At the time of ex-post evaluation, it was confirmed that no largely influential subsidence had actually been occurring and there were no problems for runway operations. According to the interviews with the flight control room and United Airlines (including pilots), installation of airfield lights on the eastern end of the reclaimed and extended runway was delayed but it was not a major problem as most landings were made from the western side of the existing runway and few from the eastern side at night due to not only wind direction but also the pilot's awareness of the lack of airfield lights. The airfield lights were installed in February 2014 and a flight check was conducted after that in November 2014.

Based on the above, it can be judged that there are no negative influences on project effectiveness and no particular issues are identified in terms of the appropriateness of the project planning and approach.

This project can be said to have been in line with FSM's development plans and needs as the airport has played an indispensable role in the air transportation of this island nation, at the time of planning and ex-post evaluation. It has also served as a project to support infrastructure development, which was a priority area for Japan in the Pacific islands and FSM at the time of planning, and was highly consistent.

In light of the above, the implementation of this project is consistent with FSM's development plan, development needs and Japan's ODA policy. Therefore, the relevance of this project is high.

### **3.2 Efficiency (Rating:②)**

#### **3.2.1 Project Outputs**

In this project, it was planned to extend the runway, expand the terminal building and procure necessary equipment at Pohnpei International Airport. Table 2 shows original and actual outputs of this project.

Table 2: Original and Actual Outputs of This Project

Facilities and Equipment	Original (as of Basic Design)	Actual
Construction of the extended runway (including reclamation and seawall, etc.)	Length: 228m Width: 152 – 198m Seawall length: 650m Reclaimed area: 36,500m <sup>2</sup> Reclamation soil volume: 208,000m <sup>3</sup>	Length: 232m Width: 152m Seawall length: 660m Reclaimed area: 36,500m <sup>2</sup> Reclamation soil volume: 329,000m <sup>3</sup>
Construction of runway and shoulder	Runway: Length 176m, Width: 45.7m Shoulder: Width 7.5m Blast pad: Length 60.9m, Width 60.9m	Runway: Length 176m, Width: 45.7m Shoulder: Width 7.6m Blast pad: Length 60.9m, Width 60.9m
Construction of turn pad	Area for mid-sized aircraft: Approx. 3,700m <sup>2</sup>	Area for mid-sized aircraft: Approx. 3,700m <sup>2</sup>
Airfield lighting system	Runway edge light: 6 Precision Approach Path Indicator (PAPI): 4 Runway End Identification Light (REIL): 2 Distance remaining sign: 1 set	Runway edge light: 6 Precision Approach Path Indicator (PAPI): Foundation only Runway End Identification Light (REIL): Foundation only Distance remaining sign: 1 set
Expansion of Apron	Area 1,790m <sup>2</sup>	Area 1,790m <sup>2</sup>
Construction of other facilities	Security fence: 802m Perimeter road: 650m Road and parking: 1,160m <sup>2</sup> etc.	Security fence: 800m Perimeter road: 660m Road and parking: 1,160m <sup>2</sup>
Expansion of passenger terminal building	Additional building: 1,288m <sup>2</sup> Renovation: 1,079m <sup>2</sup> (out of 1,870m <sup>2</sup> existing terminal building)	Additional building: 1,365m <sup>2</sup> Renovation: 1,040m <sup>2</sup>
Procurement of equipment for the terminal building	X-ray screening device: 1 Baggage handling system: 2 Baggage trolley: 30	X-ray screening device: 1 Baggage handling system: 2 Baggage trolley: 30

Source: Basic Design Study Report, Information provided by the project consultant, and Information provided by JICA

As indicated in Table 2, more reclamation soil needed to be used than originally planned due to the ground for the extended runway being softer than expected, but it was confirmed during the site survey of the ex-post evaluation that other facilities and equipment were constructed and procured mostly as originally planned and were all being utilized. No facilities or equipment had troubles<sup>6</sup>. In this project, as the project consultant that worked on the basic design study was changed<sup>7</sup> after the Exchange of Note was signed, an implementation review study was conducted to check the survey and design details undertaken until then and to re-estimate the approximate project cost and review the implementation process. As a consequence, slight changes were made, such as the shape of the seawall in the extended runway area, further expansion of the

<sup>6</sup> Since originally installed air conditioners had broken down, the implementing agency purchased alternative air conditioners and were operating them. There were deemed to be no problems.

<sup>7</sup> As Pacific Consultants International (PCI) declined bidding assistance and construction management after the company was found to have been conducting fraud and corruption activities in other ODA projects, an alternative consultant needed to be selected to conduct an implementation review study.

terminal building, and a reduction in the number of sprinklers. However, all of these changes did not negatively affect the project effectiveness, and it can be said that these changes did not cause any problems as a whole.

As stated above, this project shared development items with US-assisted AIP, and Table 3 shows the summary of those shared items.

Table 3: Components Shared between this Project and the Airport Improvement Project Supported by the United States

Facility	This Project	AIP
Runway	Reclamation for runway extension Construction of runway and shoulder Construction of turn pad	[Existing runway] Overlay pavement Construction of shoulder Improvement of settlement portion
Taxiway and apron	Construction of partial apron shoulder	Widening of taxiway fillet Taxiway resurfacing Taxiway shoulder pavement Construction of concrete hardstand Resurfacing of apron
Airfield lighting	<u>[Installation in the extended area]</u> a) Runway edge light (New installation) b) Turn pad edge light (New installation) c) Runway threshold light / Runway end light (Relocation)	<u>[Installation in the extended area]</u> a) Runway edge light (New installation) b) Taxiway (Turn pad) edge light (New installation) c) Runway threshold light / runway end light (New installation)
	<u>[Installation over the entire runway]</u> e) Illuminated distance marker (Relocation 9, new installation 1)	d) Apron edge light (New installation) f) Apron floodlight (New installation. One of them relocated in accordance with apron shoulder expansion in this project)
	h) Runway end identification light (Foundation only) i) Precision approach path indicator (Foundation only)	h) Runway end identification light (Procurement and installation) i) Precision approach path indicator (Procurement and installation)
Miscellaneous work	Other miscellaneous work (Fence, drainage etc.)	Construction of perimeter fence and road around the existing runway strip
Terminal building	Expansion of terminal building (additional building) and renovation of existing building Security equipment Baggage handling equipment	
Fire Station		Construction of Aircraft Rescue & Fire-Fighting (ARFF) building

Source: Basic Design Study Report and Information provided by the project consultant

With regard to the relationship between this project and AIP, it can be said that role-sharing was appropriately planned as referred to in ‘3.1.4 Appropriateness of Project Planning and Approach’.

In addition to the development supported by Japan and the US, FSM Government was expected to undertake some tasks. Major tasks are shown as follows.

[Pre-construction Preparation]

- To provide necessary data and information to implement the project
- To secure land necessary to implement the project
- To remove existing structures and to clear and level the site
- To coordinate with persons concerned at the airport and with the AIP project

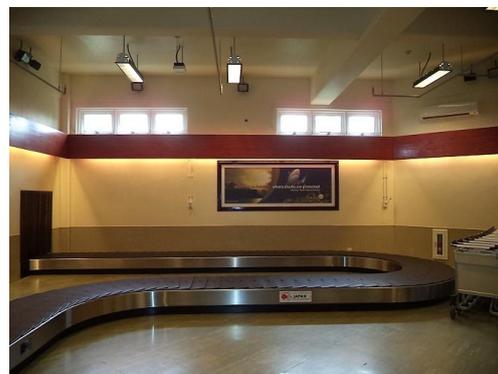
[During the Construction]

- To coordinate with the AIP project
- To implement the flight check for the runway and airfield lights
- To issue necessary NOTAM (information for aircrafts)

According to the Implementing Agency, items to be borne by FSM before and during the construction were all implemented. Airfield lights, whose installation was delayed, were also installed in 2014 and a flight check was conducted in the same year. While the commencement of the runway with the airfield lights installed in the extended area was delayed until 2014, no problems were actually caused as all aircraft<sup>8</sup> pilots using the runway were aware that lights had yet to be installed. In fact, no problems were identified in the ex-post evaluation as the extended runway was always being utilized with all the facilities developed and operational after the installation of airfield lights and the flight check in 2014. While it is considered to have been more desirable to have the airfield lights installed much earlier, there were no issues in practice at actual takeoffs and landings as the airport and United Airlines staff had sufficient understanding of the status of the runway.



X-ray Screening Device



Carousel for Checked-in Baggage

<sup>8</sup> Mainly Boeing-737 operated by the United Airlines

### 3.2.2 Project Inputs

#### 3.2.2.1 Project Cost

The approximate cost of this project to be borne by Japan was planned at 2,913 million yen, with approximately 3 million yen (25,000 dollars) planned as banking fees to be borne by FSM.

Table 4 summarizes the actual costs contributed by Japan.

Table 4: Actual Project Cost

(Unit: million yen)

	Local currency (Locally procured)	Foreign currency (Procured from Japan)	Foreign currency (Procured from a third country)	Total
Facility construction	1,272.0	1,272.0	62.6	2,606.6
Direct construction	1,055.7	1,058.3	62.6	2,176.5
Other construction	216.3	213.7	0	430.1
Equipment procurement and installation	15.8	27.9	1.6	45.3
Design and supervision	23.9	115.1	0	139.0
Total	1,311.7	1,415.0	64.2	2,790.9

Source: Data provided by the project consultant

While the original approximate project cost was calculated at the time of basic design study, it was recalculated in the implementation review study conducted after the signing of Exchange of Note to be 2,860 million yen due to fluctuation of the exchange rate. While the expenses increased and decreased due to the changes in detailed design and selection of construction items, the actual resulting cost of 2,790 million yen was within the plan (96% of the plan). Even in comparison to the amount recalculated in the implementation review study, it was confirmed to be within the planned amount.

On the other hand, it was not possible to obtain the accurate input amount by the FSM Government as the data on expenses specific to this project had not been sorted and stored. Consequently, the evaluation of the project cost was based on a comparison of the Japanese portion.

#### 3.2.2.2 Project Period

The period of this project was expected to be 28 months including detailed design and bidding periods. However, the actual period was 37.5 months from September 2008 to October 2011, exceeding the planned period (134% of the plan).

As the project consultant was changed and the implementation review study was

conducted after the Exchange of Notes was signed, there was a delay of approximately 6 months<sup>9</sup> until the actual detailed design and bidding process started. There was a need to extend the period by another 2 months due to design change procedures conducted during the final stage of this project<sup>10</sup> on a request received from the FSM Government to exclude the installation of markers on the extended runway area. These were the main factors for a longer project period.

In this project, outputs necessary to generate project effectiveness were achieved though there were slight changes to detailed components. The project cost for outputs was within the planned amount but the project period exceeded the plan by 34%. Therefore, the efficiency of the project is fair.

### 3.3 Effectiveness<sup>11</sup> (Rating:③)

#### 3.3.1 Quantitative Effects (Operation and Effect Indicators)

At the time of project planning, it was expected that an easing of weight restrictions and a shortened immigration and customs clearance time through the implementation of this project would be operation indicators.

Table 5: Operation Indicators of this Project

Indicator	Baseline (2007)	Target (2012)	Actual			
			2011	2012	2013	2014
	Planning	1 year after completion	Completion year	1 year after completion	2 years after completion	3 years after completion
Easing of payload	Reduced by approx. 20%	Eased (increase by 12% (cargo arrival) / by 20 seats)	No data  (However, no weight restriction is imposed)			
Time required for immigration	9.5 minutes	5 minutes	5 minutes	5 minutes	4 minutes	3 minutes
Time required for customs clearance	2.6 minutes	1.6 minutes	2 minutes	2 minutes	2 minutes	2 minutes

Source: Basic Design Study Report and Data provided by the Implementing Agency

Note: According to the Implementing Agency, the length of time required for immigration and customs clearance is approximate.

The effect of this project (operation indicator) was expected to be seen soon after the inauguration of the facilities. As the completion of the terminal building was March

<sup>9</sup> A contract with a new consultant was signed in March 2009.

<sup>10</sup> The main construction for this project was divided into three terms (Term 1: July 2009 – March 2011, Term 2: January 2010 – March 2011, Term 3: March 2011 – August 2011). Term 3 itself was completed by the end of the contract (August 2011).

<sup>11</sup> Sub-rating for Effectiveness is to be put together with consideration of Impact.

2011 and the completion of runway-related works was August 2011, this evaluation was based on 2012 data.

With regard to weight restriction, while detailed weight data could not be obtained from United Airlines, their regional director and Pohnpei International Airport manager commented that they had not imposed any particular restrictions on the weight nor the number of passengers due to the length of the runway after the implementation of this project. There were also comments obtained from their pilots that there had not been any special restrictions imposed. As shown in Table 1, one factor is that the gross weight of the aircraft was lessened due to a reduction in the cargo volume, but the extension of the runway to 2,068m has enabled the level of loading originally targeted. Therefore, it is considered that the original target has been virtually achieved<sup>12</sup>.

With regard to the length of time required for immigration and customs clearance and according to the Implementing Agency, shorter inspections became possible as the immigration booths increased from 3 in the past to 6 after the project implementation and the customs and quarantine areas were expanded substantially from prior to implementation. The length of time required for immigration and customs clearance cannot be generalized as items to be inspected could vary at each time, but they became 5 minutes and 2 minutes respectively in the target year of 2012, indicating that the time was clearly shortened. No congestion due to insufficient capacity of facilities has occurred after the project implementation, and it can be said that the target has generally been achieved.

Since then, the time for immigration became even shorter at 4 minutes in 2013 and 3 minutes in 2014 as the officers became more experienced. It was heard that immigration check items had not been changed in particular before or after the project.

It was also heard from the Implementing Agency and the airline that, in addition to the reduction in time for immigration, set as an indicator, the inspection of check-in baggage became efficient as an X-ray screening device and baggage handling equipment were introduced to the departure process.

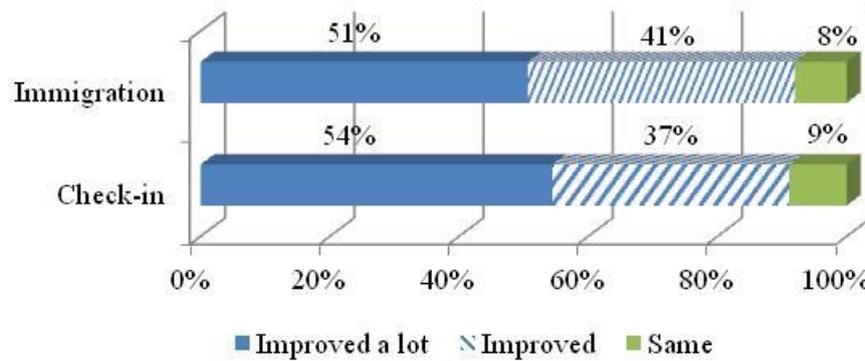
In the ex-post evaluation, a beneficiary survey<sup>13</sup> targeting airport users was

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<sup>12</sup> The length of the runway is 1,831m at Chuuk Airport and 1,753m at Kosrae Airport, both of which are connected with Pohnpei Airport on the Island-hopper Route. While it is possible to make landings at these airports even if the aircrafts from Pohnpei International Airport are on full payload, takeoffs from these airports with full payload are still difficult as the runways are short. Therefore, under the current condition where only the Island-hopper Route is operating, it is difficult to say that the merit of runway extension at Pohnpei International Airport has been fully utilized. However, as it was outside the scope of this project that the runways at Chuuk and Kosrae airports have not been extended, this point was not included in evaluation judgment.

<sup>13</sup> An interview survey with 103 departing passengers who have used Pohnpei International Airport before and after the implementation of this project was randomly conducted mainly in the airport departure lounge. The survey mainly concerned the change in check-in process and immigration check, satisfaction with the improvement of the terminal facilities and auxiliary facilities, maintenance status, etc.

conducted to gather opinions on the improvement status of immigration checks and the check-in process. More than 90% of the users responded that the procedures ‘improved a lot’ or ‘improved’, indicating an effect of the project implementation.



Source: Result of the Beneficiary Survey

Figure 1: Satisfaction Level with Immigration and Check-in Procedures

### 3.3.2 Qualitative Effects (Other Effects)

At the time of project planning, safety of the runway was not secured at Pohnpei International Airport as the distance between the end of the runway and the seawall was only 29m. However, it was expected that safety at the time of takeoff and landing was expected to improve with the construction of a blast pad (61m) and runway safety area (24m) in this project. In 2008, when this project was being planned, Asia Pacific Airlines, operating cargo services, caused an overrun accident at Pohnpei International Airport, and one of the factors was said to be the short runway.

According to the Implementing Agency and the airline (United Airlines), sufficient safety has been secured for airplane takeoff and landing after the implementation of this project.

Based on the above, it can be judged that sufficient safety has been secured, as planned, with a sufficient distance from the end of the runway to the coast line.

## 3.4 Impacts

### 3.4.1 Intended Impacts

At the time of project planning, the following impacts of the project implementation were expected.

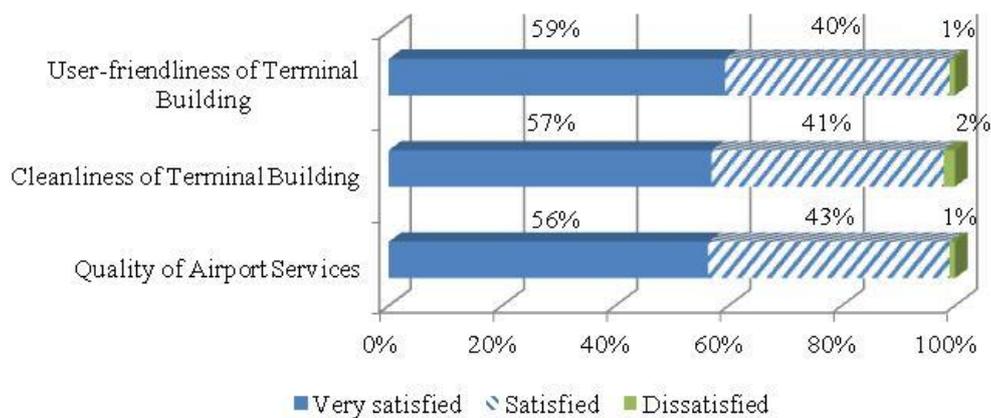
- (I) Medium-sized aircraft Boeing-767 can make a landing in the event of emergency.
- (II) The stress on pilots during takeoff and landing will be reduced.

(III) The service level as an international airport for passengers including foreign tourists will be improved.

With regard to (I), it is only the B-737 or B-727, smaller than the B-767, that are making takeoffs and landings at Pohnpei International Airport after the implementation of this project, and no takeoff or landing by a B-767 has actually been performed. Even if it were to actually land, Pohnpei International Airport would not have equipment such as boarding steps for passengers for the B-767. However, as a result of the runway extension, ‘emergency landing’ has become possible as a B-767 can technically perform takeoffs and landings.

Concerning (II), the reduction of the psychological burden of pilots at the time of takeoff and landing, pilots on United Airlines B-737s commented that the operation itself had not changed before or after the project, but their psychological burden was significantly reduced as there is a sufficient distance from the end of the runway. Therefore, an expected impact has clearly been generated.

Regarding (III), the improvement of services as an international airport, the following is a result of the beneficiary survey on satisfaction of the airport and the extent of service improvement.



Source: Result of the Beneficiary Survey

Figure 2: Satisfaction Level of Airport Users

As in Figure 2, it has become clear that satisfaction was high for airport facilities such as the ease of use and cleanliness of the terminal building, and almost all the respondents were satisfied with the quality of airport services. As to the question on whether airport services improved after the airport improvement was implemented, 62% replied that they ‘Improved a lot’ and 31% answered ‘Improved’, while the remaining

7% responded 'Same', showing that the service improved with the implementation of this project and users were satisfied with the service. As the largest changes felt by airport users were the easing of congestion and the improvement of comfort of the terminal building, it is thought that this project made a large contribution to the impact expected in (III).

While no induced effect of this project on the local economy was confirmed, Pohnpei International Airport has been receiving nearly 20,000 visitors annually as indicated in Table 1, and the quality of services provided to these airport users is higher than before. Consequently, it is clear that airport users have been highly satisfied.

### 3.4.2 Other Impacts

#### 3.4.2.1 Impacts on the Natural Environment

In the development study conducted before the implementation of this project, the Environmental Impact Assessment (EIA) was conducted regarding the impact of this project on the natural environment. It was confirmed as a result that undesirable environmental impacts would be very minor and the EIA was approved in April 2006 by the Environmental Protection Agency of the Pohnpei State.

When concrete project details were discussed, it was necessary to take appropriate measures such as installing contamination prevention film during construction as water contamination could have occurred when the land was reclaimed. With these measures, it was believed that negative environmental impact would be prevented.

According to the Implementing Agency and beneficiary survey, no negative impact on the natural environment was observed during or after the project when checked during the ex-post evaluation study. According to the EPA of Pohnpei State, installation of the contamination prevention film, monthly monitoring of water quality, and waste disposals were all conducted appropriately during the project. The soil for reclamation of the extended runway was dredged from a nearby island and all the requirements by EPA were observed. A survey was conducted on the impact of the extended runway reclamation on the ocean's current, and no problems have been reported in all fields even after the completion of the project.

As shown above, the use of contamination prevention film, monitoring of water quality, waste disposal, etc., were all conducted without problem, and no negative impact on the natural environment has occurred during or after the project. Therefore, no problems are observed.

#### 3.4.2.2 Land Acquisition and Resettlement

According to the Implementing Agency and EPA of Pohnpei State, this project was

implemented within the existing land area, no fishermen were active in the reclaimed area as their main fishing ground, and no complaints had been received from residents. It can be judged that there were no problems as no resettlement and land acquisition cases occurred.

With regard to effectiveness, it was confirmed that no restrictions on the payload of airplanes had been imposed in practice after the implementation of this project, though concrete data on weight restrictions were not provided and the demand for cargo decreased. It can also be said that the target figures of other indicators were generally achieved. The safety of airplane takeoff and landing improved with the runway extension satisfying the international standards, and the effect of eliminating the psychological burden of pilots at takeoff and landing was seen. Furthermore, the airport's handling capacity and service level also improved with the expansion of the terminal building. Regarding the impact on the natural environment, there were no negative impacts as sufficient countermeasures were taken, and neither resident resettlement nor land acquisition cases occurred.

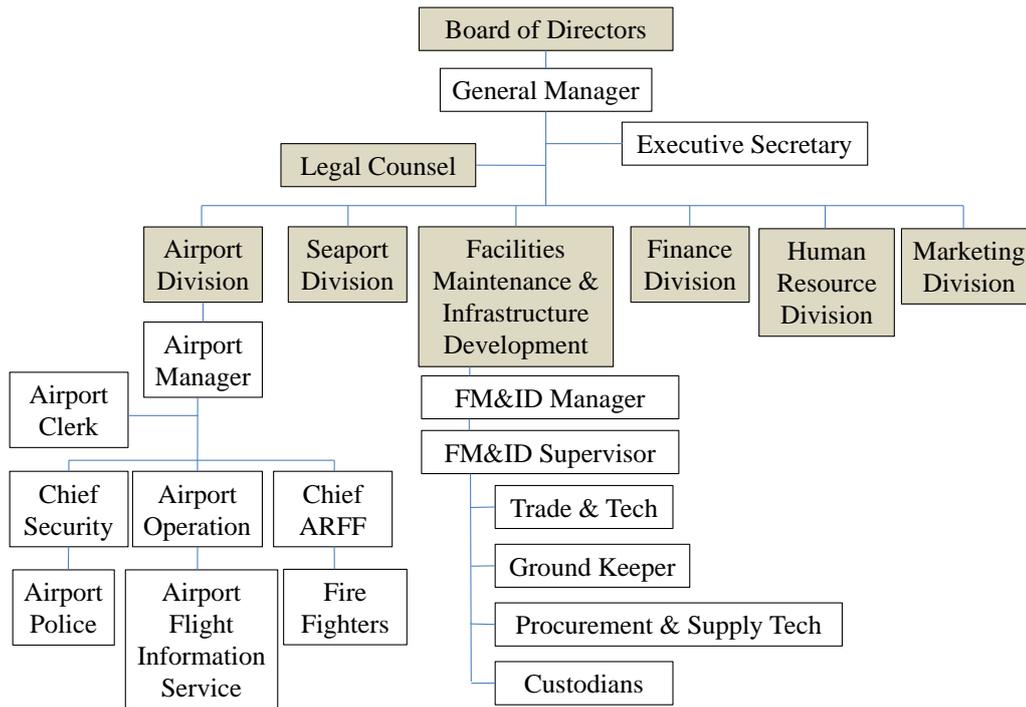
In light of the above, the effectiveness and impact of this project are high.

### **3.5 Sustainability (Rating:③)**

#### **3.5.1 Institutional Aspects of Operation and Maintenance**

This project was implemented with Pohnpei Port Authority (hereinafter referred to as 'PPA') as the implementing agency and the Department of Transportation, Communication and Infrastructure (DOTC&I) as the governmental department in charge. DOTC&I was responsible for policy planning at the FSM national level, and port authorities in each state were in charge of actual operations and management of airports. This structure remained the same at the time of ex-post evaluation.

PPA, managing Pohnpei International Airport, consists of 6 divisions under a general manager with a total of 82 members at the time of ex-post evaluation. The divisions are Airport Division, Facilities Maintenance & Infrastructure Development Division, Seaport Division, Finance Division, Human Resource Division, and Marketing Division. The Airport Division is operating the airport, and the Facilities Maintenance & Infrastructure Development Division is undertaking the maintenance of facilities. No issues were observed in terms of organizational structure and the number of staff members.



Source: Prepared based on the information provided by PPA

Figure 3: Organization Chart of Pohnpei Port Authority (Simplified version)

FAA has been the safety administrator of FSM airports since the days of Trust Territory of the Pacific Islands, before FSM became independent, and has set all the regulations pertaining to airport administration. In terms of equipment maintenance, it was confirmed that FAA was directly operating and maintaining the Runway End Identification Light (hereinafter referred to as ‘REIL’) and the Precision Approach Path Indicator (hereinafter referred to as ‘PAPI’) at the time of ex-post evaluation<sup>14</sup>.

### 3.5.2 Technical Aspects of Operation and Maintenance

According to the Implementing Agency, there were no technical problems with maintaining the facilities and equipment at Pohnpei International Airport. When the actual operation and maintenance status was checked during the site surveys in the ex-post evaluation, no technical issues were found in particular, and it was thought that there were no technical problems as a whole.

However, as stated above, FAA has been maintaining REIL and PAPI among all airfield lights even during at the time of ex-post evaluation since PPA does not possess qualifications or capacities to implement it. Therefore, FAA is scheduled to continue operation and maintenance. It can be judged however; there are no concerns in terms of

<sup>14</sup> Technicians based in Guam undertake maintenance activities by visiting Pohnpei International Airport every month. All expenses are borne by FAA.

the technical aspect of airport operations and management as FAA has set and administered the regulations on airport safety management due to historical background, and it is expected that this policy will be sustained.

With regard to training on technical capacity improvement, a training program has been carried out every year mainly by FAA for airport staff in the field of rescue, firefighting, and airport security. Two Micronesian air traffic controllers are on duty after obtaining and renewing their qualifications with the support of FAA. It was thought that there were no problems with the overall training system.

### 3.5.3 Financial Aspects of Operation and Maintenance

The financial statement of PPA has not been sorted by division and the operation and maintenance expenses for airport and seaport are integrally processed. Therefore, it was not possible to obtain the expense reports specific to the airport.

Much of PPA's revenues come from the seaport such as through port charges and airport-related revenues which are relatively small. However, the entire authority has been recording a surplus in recent years except the Financial Year (FY) 2011. In particular, a large surplus was recorded in FY2013 due to a significant increase in port revenues.

No financial problems in relation to sustainability were observed as it was heard that a necessary amount had been spent for operation and maintenance of the airport.

Table 6: Statement of Revenues and Expenses

(Unit: thousand dollars)

FY (October - September)	FY2009	FY2010	FY2011	FY2012	FY2013
[Operating Revenues]					
Departure fees	176	196	192	183	224
Land leases and space rentals	358	442	414	418	457
Landing fees	98	103	88	87	91
Other	52	13	33	30	145
Seaport charges	2,000	2,036	1,600	1,753	2,724
Less allowance for doubtful debts	-287	-165	-67	-9	160
Net operating revenues	2,396	2,624	2,260	2,463	3,800
[Operating Expenses]					
Salaries and benefits	972	1,003	1,101	1,050	1,070
Depreciation and Amortization	562	469	406	428	424
Utilities	113	113	174	244	291
Travel	111	118	92	118	101
Maintenance	188	197	260	197	266
Other	145	234	242	196	490
Total operating expenses	2,091	2,063	2,276	2,234	2,642
Earnings from operations	305	561	-16	229	1,158
Non-operating revenues (net)	16	0	9	6	175
Change in net assets	321	561	-8	234	1,334

Source: Prepared from PPA Annual Reports

While it does not appear on PPA's financial statement, FAA has supported some expenses for maintenance and training (details could not be obtained) in addition to the training and maintenance expenses provided by PPA. After the Compact of Free Association between FSM and the US comes to an end in 2023, it is not clear if sufficient support at the current level will be provided. As it is possible that the amount of support will be slashed, it is considered to be necessary to continue the efforts to secure and expand their own revenue source by 2023.

#### 3.5.4 Current Status of Operation and Maintenance

In this project, subsidence of the extended runway area continued to occur since the construction period, as already stated. However, it was confirmed that the subsidence had almost stopped 6 months after the completion of construction, and the extended area was put to use in June 2012. According to PPA and the project consultant, as this subsidence was expected to last for some time right from the beginning, the subsidence level was surveyed monthly after the construction was completed to record the subsidence status of the entire reclaimed area. No further subsidence had occurred to the time of ex-post evaluation, and there seems to be no problems to keep using the runway.

It was additionally confirmed that the facilities and equipment developed in this project were generally managed in good condition. In PPA's Facilities Maintenance & Infrastructure Development Division, a maintenance plan defining the inspection items and frequencies of checks of airport facilities and equipment such as those for the terminal building, rescue and firefighting, runway fence, runway lights and markings were prepared and operated, and inspected using a worksheet. Regarding the procurement of spare parts, it was heard that while transportation after placement of order could require some time, there were generally no problems including the budget.

Overall, there are no major issues in terms of operation and maintenance as PPA had formulated a maintenance plan and the facilities and equipment were generally in good condition.

In light of the above, there are no particular concerns on the institutional, technical and financial aspects as well as operation and maintenance status. Therefore, the sustainability of the project effects is high.

## **4. Conclusion, Recommendations and Lessons Learned**

### **4.1 Conclusion**

In this project, a runway was rehabilitated and extended and a terminal building was expanded and renovated to improve the safety of airplanes at the time of takeoff and landing while increasing the capacity of passenger handling. This project was consistent with the development plan and needs of the Federated States of Micronesia (hereinafter referred to as 'FSM'), as well as the priority areas of Japan's ODA policy. Therefore, the relevance of this project is high. With regard to project implementation, the project components were implemented mostly as planned and the project cost was within the planned amount. However, the efficiency was judged to be fair as the project period exceeded the plan. With respect to project effectiveness, it was confirmed that the quantitative targets, such as easing of payload and time required for various inspections expected at the time of planning, were mostly achieved, and safety at the time of takeoff and landing, a qualitative effect, also improved. As to the impact of the project, it was confirmed that the stress on pilots during takeoff and landing was reduced, and the service level of the airport was improved. Therefore, the effectiveness and impact of this project are high. Regarding sustainability, there were no particular issues in terms of all institutional, technical and financial aspects, and operation and maintenance status. The project effects generated in this project are considered to be sustained in the future.

In light of the above, this project is evaluated to be highly satisfactory.

## **4.2 Recommendations**

### 4.2.1 Recommendations to the Implementing Agency

#### Strengthening of Operation and Maintenance Structure

Airport facilities and equipment were generally operated and maintained in good condition, partly with technical support from FAA at the time of ex-post evaluation. However, it is said that financial assistance to FSM may drop sharply after the Compact of Free Association with the US comes to an end in 2023. Therefore, it is difficult to judge in the ex-post evaluation whether the FSM Government will be able to allocate a sufficient budget independently to conduct operation and maintenance at the same level after such time. It will be important to further strengthen the operation and maintenance structure including independent maintenance of airfield lighting while putting in perspective a possibility of a significant decline in the financial and technical support level.

### 4.2.2 Recommendations to JICA

None

## **4.3 Lessons Learned**

#### Project Implementation based on Sufficient Coordination with Organizations Concerned

This project was implemented in parallel with the US-assisted AIP. As a result of consultations with DOTC&I and FAA under the coordination of the FSM Government, development items such as runway, apron and airfield lighting were shared and the project was implemented without particular delay during the construction period. At an airport in FSM administered by FAA, information was shared from the development study stage among the organizations concerned including DOTC&I and Pohnpei State Government (including PPA), and sufficient consultations and coordination were made when this project was designed, all of which are considered to have led to smooth implementation of the entire plan including this project. Therefore, in a project supported by several donor agencies, it will be important to ensure sufficient information sharing and coordination from the initial stage of the plan among the related parties including governments of the recipient countries.

(End)