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RESTRUCTURING PAPER

ON A

**PROPOSED PROJECT RESTRUCTURING
OF
THE SECOND PHASE OF THE
PACIFIC REGIONAL CONNECTIVITY PROGRAM:
PALAU-FSM CONNECTIVITY PROJECT
GRANT D-004-FM**

BOARD APPROVAL: DECEMBER 17, 2014

TO THE

THE FEDERATED STATES OF MICRONESIA

January 12, 2015

**TRANSPORT AND ICT
EAST ASIA AND PACIFIC REGION**

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ABBREVIATIONS AND ACRONYMS

\$	All dollars are in United States dollars unless otherwise indicated
ADB	Asian Development Bank
DoFA	Department of Finance and Administration (FSM)
FM	Financial management
FSM	Federated States of Micronesia
FSMTC	Telecommunications Corporation (FSM)
Gbps	Gigabits per second
GDP	Gross domestic product
ICB	International competitive bidding
ICPC	International Cable Protection Committee
ICT	Information and communication technologies
IRU	Indefeasible right of use
LIB	Limited international bidding
OAE	Open access entity
TA	Technical assistance

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**FEDERATED STATES OF MICRONESIA
PALAU-FSM CONNECTIVITY PROJECT**

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DATA SHEET

Micronesia, Federated States of

Pacific Regional Connectivity Program 2:Palau-FSM Connectivity Project (P130592)

EAST ASIA AND PACIFIC

Transport & ICT

Report No: RES21856

Basic Information									
Project ID:	P130592			Lending Instrument:	Investment Project Financing				
Regional Vice President:	Axel van Trotsenburg			Original EA Category:	Partial Assessment (B)				
Country Director:	Franz R. Drees-Gross			Current EA Category:	Partial Assessment (B)				
Senior Global Practice Director:	Pierre Guislain			Original Approval Date:	17-Dec-2014				
Practice Manager/Manager:	Randeep Sudan			Current Closing Date:	31-Jan-2020				
Team Leader(s):	James L. Neumann, Natasha Beschorner								
Borrower:	Ministry of Finance								
Responsible Agency:	Department of Transport, Communication and Infrastructure								
Restructuring Type									
Form Type:	Full Restructuring Paper			Decision Authority:	Country Director Approval				
Restructuring Level:	Level 2								
Financing (as of 03-Dec-2015)									
Key Dates									
Project	Ln/Cr/TF	Status	Approval Date	Signing Date	Effectiveness Date	Original Closing Date	Revised Closing Date		
P130592	IDA-D0040	Effective	17-Dec-2014	06-Mar-2015	11-Mar-2015	31-Jan-2020	31-Jan-2020		
Disbursements (in Millions)									
Project	Ln/Cr/TF	Status	Currency	Original	Revised	Cancelled	Disbursed	Undisbursed	% Disbursed
P130592	IDA-D0040	Effective	XDR	32.10	32.10	0.00	0.74	31.36	2
Policy Waivers									

Does the project depart from the CAS/CPF in content or in other significant respects?	Yes []	No [X]
Does the project require any policy waiver(s)?	Yes []	No [X]
A. Summary of Proposed Changes		
<p>In order to allow FSM to buy capacity on the SEA-US cable system being installed by NEC between Indonesia, Philippines and Guam, the changes being proposed in this restructuring are:</p> <ol style="list-style-type: none"> 1. Revise the language in Part 1(a) to provide financing for the construction of a new cable system (and/or the procurement of capacity rights) to connect Yap to the global telecommunications network. 2. Provide for a one-time lifting of the withdrawal conditions under set forth in Section IV.B.1.(b) of Schedule 2 to the Financing Agreement to allow for a one-time payment under Category 1(a) in an amount not to exceed \$5.2 million under Category 1(a) for Part 1(a) and \$4.2 million under Category 1(a) for Part 1(b). 3. Revise those provisions of the Financing Agreement which prescribe the joint procurement by FSM and Palau of cable system assets, financed by the International Development Association and the Asian Development Bank. 		
Change in Implementing Agency	Yes []	No [X]
Change in Project's Development Objectives	Yes []	No [X]
Change in Results Framework	Yes [X]	No []
Change in Safeguard Policies Triggered	Yes []	No [X]
Change of EA category	Yes []	No [X]
Other Changes to Safeguards	Yes []	No [X]
Change in Legal Covenants	Yes []	No [X]
Change in Loan Closing Date(s)	Yes []	No [X]
Cancellations Proposed	Yes []	No [X]
Change to Financing Plan	Yes []	No [X]
Change in Disbursement Arrangements	Yes []	No [X]
Reallocation between Disbursement Categories	Yes []	No [X]
Change in Disbursement Estimates	Yes []	No [X]
Change to Components and Cost	Yes []	No [X]
Change in Institutional Arrangements	Yes []	No [X]
Change in Financial Management	Yes []	No [X]
Change in Procurement	Yes [X]	No []
Change in Implementation Schedule	Yes []	No [X]
Other Change(s)	Yes [X]	No []
Appraisal Summary Change in Economic and Financial Analysis	Yes [X]	No []
Appraisal Summary Change in Technical Analysis	Yes []	No [X]

Appraisal Summary Change in Social Analysis	Yes [] No [X]
Appraisal Summary Change in Environmental Analysis	Yes [X] No []
Appraisal Summary Change in Risk Assessment	Yes [] No [X]

B. Project Status

The Project became effective as of March 11, 2015. A Project Coordinator was appointed on June 10, 2015. Specialist legal technical and financial advisers have been retained to assist on legal and transactional issues associated with sector development and investment issues including: (a) the future ownership of existing and new international connectivity assets; (b) possible financial and ownership restructuring of FSMTC and the establishment of the open access entity (OAE) that will implement Part 1; and (c) transactional issues implementing the proposed connectivity infrastructure investments and institutional restructuring. An individual technical consultant has also been retained to assist with technical project management of the PYG cable (jointly with Palau via the joint MicroPal committee) and the Chuuk Pohnpei cable. Work on the creation of the Telecommunications Regulatory Authority is expected to begin in early 2016.

The Government's Project Team is now focused on: (a) negotiating and finalizing the commercial arrangements for contracting with SEA-US and NEC for the procurement of capacity rights and the construction of a new cable to connect Yap to the global telecommunications network; and (b) evaluating whether using NEC to supply the Chuuk-Pohnpei cable system would secure greater efficiencies than any alternative supplier selected on the basis of LIB or ICB. Aside from procurement activities, the Government is also working on the actions needed to satisfy the disbursement conditions for Part 1, particularly the creation and operationalization of the OAE, all in form and substance satisfactory to the Bank. It is noted that if these steps are not completed prior to the date for any subsequent payments, responsibility for these payment obligation(s) would fall on Government until such time as use of project funds is cleared. The project objectives continue to be achievable.

C. Proposed Changes

Development Objectives/Results

Project Development Objectives

Original PDO

The development objective of the Project is to reduce the cost and increase the availability of ICT services needed to support social and economic development in the Recipient's territory.

Change in Project's Development Objectives

Change in Results Framework

Explanation:

Revise the indicator pertaining to the length of fiber optic cable built to clarify that the indicator will measure the total length of fiber optic cable access for FSM.

Other Change(s)

Change in Procurement

Explanation:

Revise Section III.A.B.2 of Schedule 2 to the Finance Agreement to permit the use of limited international bidding as one of the other methods of procurement of Goods, Works, and Nonconsulting Services.

Other Change(s)

Explanation:

1. Revise the language in Part 1(a) of the Financing Agreement to provide financing for the construction of a new cable system (and/or the procurement of capacity rights) to connect Yap to the global telecommunications network. This change is needed due to changed commercial circumstances. FSM and Palau may no longer jointly procure and install a standalone cable system. Instead FSM proposes to contract with NEC for the installation of a cable spur which will connect to the SEA-US cable; and it would contract with SEA-US consortium members Telin or Globe (counterpart still to be determined) for an indefensible right of use (IRU) (5x100G) providing connectivity to the POI on Guam. It is expected that Palau would enter into similar contractual arrangements for its connectivity to Guam. Negotiations with SEA-US and NEC have been carried out collaboratively between FSM and Palau.
2. Provide for a one-time lifting of the withdrawal conditions set forth in Section IV.B.1.(b) of Schedule 2 to the Financing Agreement to allow for a one-time payment under Category 1(a) in an amount not to exceed \$5.2 million under Category 1(a) for Part 1(a) and \$4.2 million under Category 1(a) for Part 1(b). While Government has made considerable progress towards satisfying these conditions, initial payment obligations to SEA-US and NEC are expected on or about December 22, 2015, which does not provide sufficient time for FSM to complete the necessary steps contemplated prior to any withdrawal under the Financing Agreement. All disbursement conditions set forth in the Section IV.B.1. remain in full force and effect and will have to be met before any other withdrawals under the said Category can be made. Accordingly, a critical risk, which has been discussed at length with Government, is that subsequent withdrawal requests for payment to SEA-US and NEC may not be approved until the steps needed to fulfill these conditions have been completed, all in form and substance satisfactory to the Bank. If these steps are not completed by the next payment date, currently anticipated on July 31, 2016, these payment obligation(s) would fall on Government until such time as use of project funds is cleared.
3. Revise those provisions of the Financing Agreement which prescribe the joint procurement by FSM and Palau of cable system assets, financed by the International Development Association and the Asian Development Bank. These provisions are no longer necessary or appropriate due to the several nature of the obligations which will be incurred by FSM and Palau with their suppliers. Using SEA-US would reduce project execution risk, but would not otherwise undermine or alter the regional and collaborative basis of these activities, which are being closely coordinated on behalf of FSM and Palau via the joint MicroPal committee.
4. Insert a new Paragraph (viii) of Section IV.B.1(b) of Schedule 2 of the Financing Agreement to read as follows: "(vi) in all other respects, implementation arrangements for Part (1)(a) have been completed." This change is necessary to address any alternative implementation arrangements which may be required in the event that FSM cannot reach agreement with NEC and SEA-US for the supply of infrastructure and capacity rights for Yap.
5. Specify training as an eligible expenditure that may be financed out of the proceeds of the Financing under Category 4.
6. Recognize that Part 1 of the Project may be carried out by DOFA and DTCI until such time as the FSM Open Access Entity has been established and operationalized.

Appraisal Summary

Appraisal Summary Change in Economic and Financial Analysis

Explanation:

It is anticipated that the revised arrangements will result in a substantial saving on CAPEX for Yap of approximately \$7 million. It is expected that the CAPEX for Chuuk may increase by approximately \$5 million due largely to higher than anticipated marine costs and the loss of potential cost savings of \$6 million that estimated and attributed to Chuuk on the basis that the PYG cable and Chuuk cable systems were procured jointly under a single contract (noting, however, that a number of procurement issues have since been identified which may have precluded or made such cost-savings difficult to achieve). There is also provision for a slight increase in OPEX for Yap (depending on whether OPEX costs for Yap are bundled as part of the costs of the IRU as a one-off payment for the first 10 years) because the estimates now include the costs of holding spares at the Yap landing and on Guam. The revised arrangements also now provide for a small reduction in the OPEX estimate for the Chuuk Pohnpei cable system (based on the latest costs estimates received from NEC). The overall impact of the revised arrangements on the net economic impact (ERR) of the Project will likely be slightly positive or potentially strongly positive depending upon the total level of capital expenditure which is required to deliver cable system connectivity for Yap and Chuuk.

Appraisal Summary Change in Environmental Analysis

Explanation:

The restructured project no longer prescribes the joint construction by Palau and FSM of a standalone cable from Guam to Palau with a spur to Yap. A new—lower impact—solution has been identified. FSM would construct a spur linking Yap to the SEA-US cable system and would buy capacity on the SEA-US cable system connecting Yap to the global telecommunications network via an existing landing facility on Guam (a United States Territory). By using capacity on SEA-US, rather than building a duplicate standalone cable system, these revised implementation arrangements would reduce costs, project management risks and social and environmental impacts. FSM will revise its Environmental and Social Management Plan to provide for due diligence reporting on environmental and social management systems and instruments applied by SEA-US in connection with the construction of the segment of the SEA-US cable which will supply capacity to FSM, consistent with FSM's status as a customer of SEA-US and accepted commercial practices. It is noted that, as a purchaser of capacity from SEA-US under a contract for an IRU, FSM would have no influence or control over the activities of SEA-US or the design, installation or functioning of the SEA-US cable. All of the parts of the SEA-US cable south east of the branching unit that would connect Yap to SEA-US is outside the area likely to be affected by the project and does not fall within the area of influence of this Project. Any activities from Guam to Hawaii and beyond carried on by SEA-US are similarly outside the area of influence of this Project.

FSM CONNECTIVITY PROJECT – RESTRUCTURING PAPER

I. SUMMARY

1. A restructuring of the Federated States of Micronesia (FSM) Connectivity project has been requested by the Government to allow FSM to purchase capacity on the South-East Asia-United States (SEA-US) submarine cable system being installed by NEC Corporation and NEC Corporation of America (collectively NEC) between Guam, Indonesia, and the Philippines. SEA-US is a consortium of PT. Telekomunikasi Indonesia International (Telin), Globe Telecom, RAM Telecom International, Hawaiian Telcom, Teleguam Holdings, GTI Corporation (a member of the Globe Telecom group of companies) and Telkom USA. SEA-US is a \$250 million project scheduled to be completed in the fourth quarter of 2016.¹

2. The original project design contemplated the joint construction by FSM and Palau of a standalone cable from Palau-Yap-Guam. Since then, the SEA-US “cable of opportunity” has emerged as a likely alternative option. The restructuring would deliver the same Project Development Objective, but with lower project risk and reduced cost and environmental and social impacts. Under a SEA-US option, FSM would expect: (a) CAPEX savings for Yap connectivity of approximately \$14 million versus \$22.5 million budgeted for a standalone cable option (potentially partially offset by cost increases for Chuuk); (b) reduced operating expense (OPEX) savings; (c) reduced project management risk, due to the involvement of international operators Telin and Globe; (d) expedited timeline for project implementation; (e) no need for separate landing party and cable landing license arrangements in Guam; and (f) potential reduction in technical assistance costs. MicroPal has determined that SEA-US is its preferred option, which precludes the implementation arrangements as originally contemplated.

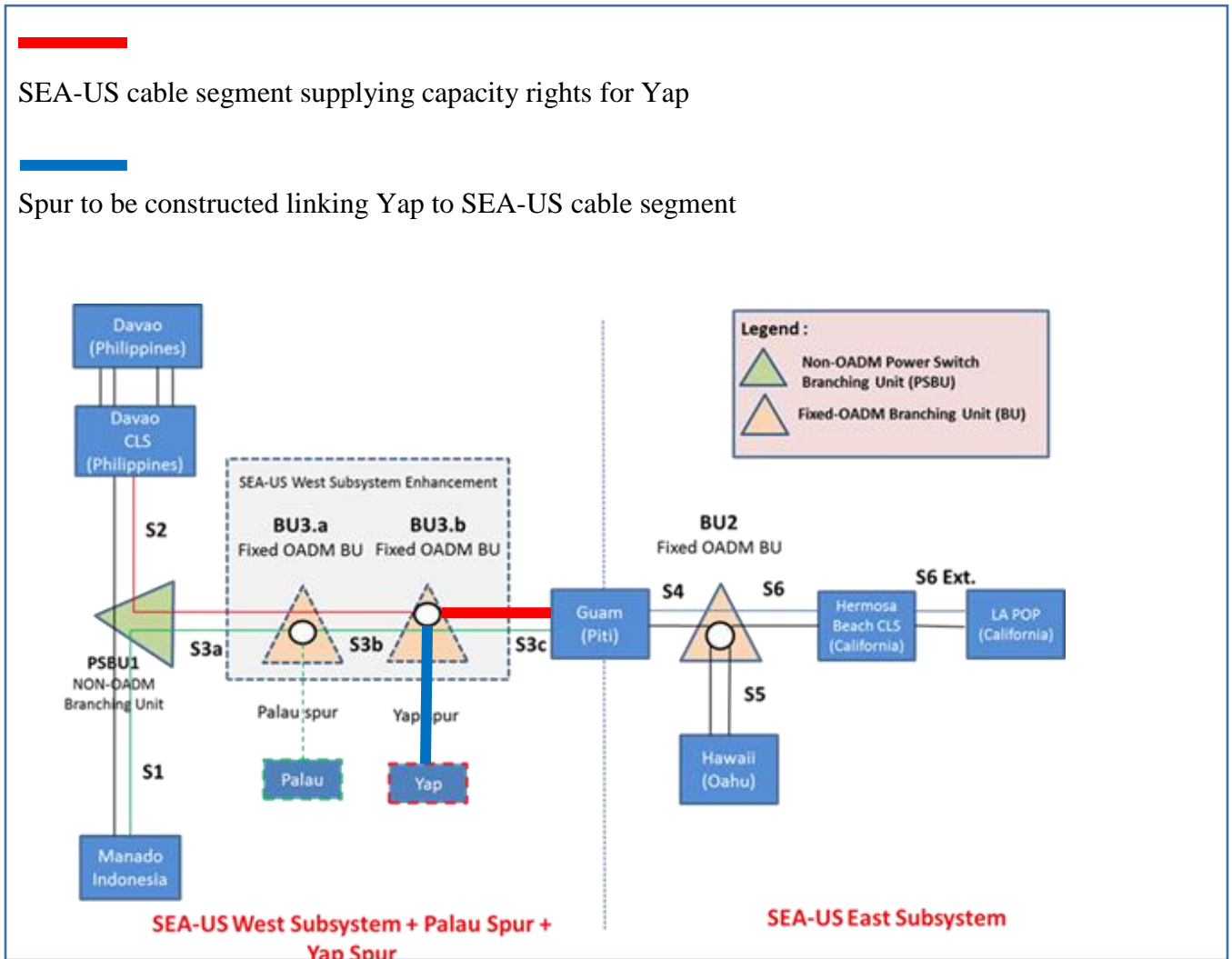
3. Under arrangements permitted by this restructuring, FSM would contract with NEC for the installation of a cable spur which would connect to the SEA-US cable; and it would contract with SEA-US consortium members Telin or Globe (counterpart to be determined) for capacity rights in the form of an indefeasible right of use (IRU) providing connectivity to Guam (5x100Gbps). It is expected that Palau would enter into similar contractual arrangements for its connection to Guam (financed by the Asian Development Bank [ADB]). Palau and FSM have collaborated via the joint MicroPal committee in negotiating with SEA-US and NEC, although under such arrangements it is no longer proposed that FSM and Palau will contract jointly with the suppliers. The provisions in the Financing Agreement that originally contemplated a joint venture agreement between FSM and Palau for the supply and installation of the cable system, including cofinancing from ADB to Palau and an memorandum of understanding (MOU) between World Bank and ADB, are no longer necessary due to the several nature of the procurement being proposed. This change would also resolve a potentially difficult issue which might otherwise have arisen with Palau and ADB around the use of joint (as opposed to parallel) financing and procurement arrangements.

¹ All dollars are in United States dollars unless otherwise indicated.

4. FSM and Palau anticipate a contract in force deadline from their proposed suppliers, SEA-US and NEC, of December 22, 2015. This timeline is being set by the commercial needs of SEA-US and NEC. Telin and Globe are currently seeking the consent of SEA-US consortium members to permit changes to the Construction and Maintenance Agreement (C&MA) for the SEA-US cable system which would be necessitated by the decision of either party to enter into an agreement to supply capacity to FSM (and Palau).

5. The revised design schematics for connecting Yap to Guam via SEA-US is shown in Figure 1.

Figure 1. Proposed Technical Schematics



6. FSM has negotiated with SEA-US and NEC, and Palau, and sought commercial arrangements which would ensure that the Chuuk-Pohnpei cable system shares in the benefits of joining with the SEA-US cable project. In this context, FSM is undertaking a technical and financial evaluation on whether using NEC to supply the Chuuk-Pohnpei

cable system under Part 1(b) of the Project would secure greater efficiencies than any alternative supplier selected competitively on the basis of limited international bidding (LIB) or international competitive bidding (ICB). While this evaluation is ongoing, it is noted that the costs for connecting Chuuk may increase above what was originally envisaged, depending on whether the Chuuk subcomponent bears the full costs of the mobilization/demobilization of a cable laying ship. A decision on sharing marine installation/mobilization costs between Yap and Chuuk has not yet been possible due to timing pressures imposed by SEA-US/NEC and insufficient ship capacity (to lay SEA-US and the spurs for Palau and Yap under a single ship mobilization). However, the alternative, preventing Yap from participating in SEA-US in order to combine it with Chuuk for a standalone procurement (with or without Palau), would likely increase costs overall. The savings under the SEA-US option for Yap would likely offset any additional costs incurred for Chuuk.

7. The Recipient has identified a potential need for additional financing to increase the budget for Component 4 (Project Management) from \$0.75 million to \$1.0 million. Additional financing may also be required due to the impact of depreciation of the SDR (special drawing rights) against the United States dollar which may reduce the amount of funding available under the Project. However, no additional financing is sought at this time.

II. PROJECT STATUS

8. The Project became effective as of March 11, 2015. A Project Coordinator was appointed on June 10, 2015. Specialist legal technical and financial advisers have been retained to assist on legal and transactional issues associated with sector development and investment issues including: (a) the future ownership of existing and new international connectivity assets; (b) possible financial and ownership restructuring of FSMTC (Telecommunications Corporation) and the establishment of the open access entity (OAE) that will implement Part 1; and (c) transactional issues implementing the proposed connectivity infrastructure investments and institutional restructuring. An individual technical consultant has also been retained to assist with technical project management of the PYG cable (jointly with Palau via the joint MicroPal committee) and the Chuuk-Pohnpei cable. Work on the creation of the Telecommunications Regulatory Authority is expected to begin in early 2016.

9. The Government's Project Team is now focused on: (a) negotiating and finalizing the commercial arrangements for contracting with SEA-US and NEC for the construction of a new cable system (and/or the procurement of rights) to connect Yap to the global telecommunications network; and (b) evaluating whether using NEC to supply the Chuuk Pohnpei cable system would secure greater efficiencies than any alternative supplier selected on the basis of LIB or ICB. Aside from procurement activities, the Government is also working on the actions needed to satisfy the disbursement conditions for Part 1, particularly the creation and operationalization of the OAE, all in form and substance satisfactory to the Bank. It is noted that if these steps are not completed prior to the date for any subsequent payments, responsibility for these payment obligation(s) would fall on Government until such time as use of project funds is cleared.

III. PROPOSED CHANGES

10. The proposed changes to this restructuring are to:
- (a) Revise the language in Part 1(a) of the Financing Agreement to permit financing for the construction of a new cable system (and/or the procurement of capacity rights) to connect Yap to the global telecommunications network. This change is needed due to changed commercial circumstances. FSM and Palau may no longer jointly procure and install a standalone cable system. Instead FSM proposes to contract with NEC for the installation of a cable spur which will connect to the SEA-US cable; and it would contract with SEA-US consortium members Telin or Globe (counterpart still to be determined) for an IRU (5x100Gbps) providing connectivity to Guam. It is expected that Palau would enter into similar contractual arrangements for its connectivity to Guam. Negotiations with SEA-US and NEC have been carried out collaboratively by FSM and Palau. A related technical change to the Financing Agreement is also proposed to clarify that FSM Open Access Entity may satisfy its obligation to enter into one or more Landing Party Agreements through the acquisition of rights under such agreement(s).
 - (b) Provide for a one-time lifting of the withdrawal conditions set forth in Section IV.B.1.(b) of Schedule 2 to the Financing Agreement to allow for a one-time payment under Category 1(a) in an amount not to exceed US\$5.2 million under Category 1(a) for Part 1(a) and US\$4.2 million under Category 1(a) for Part 1(b). While Government has made considerable progress towards satisfying these conditions, initial payment obligations to SEA-US and NEC are expected on or about December 22, 2015, which does not provide sufficient time for FSM to complete the necessary steps contemplated prior to any withdrawal under the Financing Agreement. All disbursement conditions set forth in the Section IV.B.1. remain in full force and effect and will have to be met before any other withdrawals under the said Category can be made. Accordingly, a critical risk, which has been discussed at length with Government, is that subsequent withdrawal requests for payment to SEA-US and NEC may not be approved until the steps needed to fulfill these conditions have been completed, all in form and substance satisfactory to the Bank. If these steps are not completed by the next payment date, currently anticipated on July 31, 2016, these payment obligation(s) would fall on Government until such time as use of project funds is cleared.
 - (c) Revise the Financing Agreement to recognize that Part 1 of the Project may be carried out by DOFA and DTCI until such time as the FSM OAE has been established and operationalized.
 - (d) Revise those provisions of the Financing Agreement which prescribe the joint procurement by FSM and Palau of cable system assets, financed by the International Development Association and the ADB. These provisions are no longer necessary or appropriate due to the several nature of the obligations

which will be incurred by FSM and Palau with their suppliers. Using SEA-US would reduce project execution risk, but would not otherwise undermine or alter the regional and collaborative basis of these activities, which are being closely coordinated on behalf of FSM and Palau via the joint MicroPal committee.

- (e) Insert a new provision in the Financing Agreement which would provide that no withdrawal shall be made under Category (1)(a) until the Recipient has provided evidence satisfactory to the Association that, in all other respects, implementation arrangements for Part 1(a) have been completed. This change would address any alternative implementation arrangements which may be required in the event that FSM cannot reach agreement with NEC and SEA-US for the supply of infrastructure and capacity rights for Yap.
- (f) Specify Training as an eligible expenditure that may be financed out of the proceeds of the Financing under Category 4.
- (g) Specify Limited International Bidding as one of the other permitted methods of Procurement of Goods, Works and Non-consulting Services.
- (h) Revise the indicator pertaining to the length of submarine fiber optic cable built to clarify that the indicator will measure the total length of submarine fiber optic cable serving FSM financed under the Project.

IV. APPRAISAL SUMMARY

Financial and Economic

Financial analysis

11. Overall it is anticipated that the revised arrangements will result in a substantial saving on CAPEX for Yap of approximately \$7 million. It is expected that the CAPEX for Chuuk may increase by approximately \$5 million, due largely to higher than anticipated marine costs and the loss of potential cost savings of \$6 million that were estimated and attributed to Chuuk on the basis that the PYG cable and Chuuk cable systems would be procured jointly under a single contract.

12. The revised CAPEX estimate for Chuuk assumes a midpoint between estimated costs of \$22.0 million (optimized estimated for NEC excluding Chuuk cable station) and \$24.5 million (original estimate excluding cost savings). The largest unknown factor which will impact the costs of the Chuuk cable system are marine installation costs which cannot be more precisely estimated at this time. Changes to the CAPEX costs for Chuuk will not materially alter the financing assumptions for the price for bandwidth for Chuuk (or Yap) which depend upon OPEX costs—the financial assumptions for the price of bandwidth for Yap and Chuuk exclude the costs of capital (due to financing on grant terms).

13. Expert advisers to FSM consider that CAPEX costs for Chuuk of \$18.5 million—the budgeted amount for Chuuk as originally appraised including costs savings—is within reach with specification optimization, and tight budgeting and coordination. Additionally, it is no longer apparent that the \$6 million of CAPEX savings that were attributed to the Chuuk cable system costs under the original design would be achievable—these estimated savings depended upon the PYG cable (which is no longer the preferred option of MicroPal) and Chuuk cable system being procured under a single contract jointly with Palau. A number of procurement issues have since been identified which may have precluded or made such cost-savings difficult to achieve.

14. There is also provision for a slight increase in OPEX for Yap because the estimates now include the costs of holding spares at the Yap landing and on Guam (the latter included in the OPEX costs for the IRU). As a result, an increase in costs for international bandwidth is expected of approximately \$55/Mbps/mth for Yap on a standalone basis and \$12/Mbps/mth under a uniform three states pricing scenario for Yap-Chuuk-Kosrae. However, if OPEX were bundled with the IRU on the SEA-US cable system as a one-off payment for the first 10 years, an overall decrease in bandwidth price could be expected—a decrease of \$20/Mbps/mth for Yap alone and a decrease of \$12/Mbps/mth under a three states scenario—as described in Table 1.

15. It is also noted that there are limits to comparing the current proposal with what was originally appraised under the PYG cable option. The lower OPEX on Yap anticipated a one-quarter Yap, three-quarters Palau cost sharing which no longer reflects the balance of collaboration between the parties. Recent negotiations for the sharing of common costs (e.g., the cost of buying and storing spare parts) indicate that FSM and Palau may share costs on the basis of one-third for FSM (Yap) and two-thirds for Palau. If the estimated OPEX costs—as originally appraised—were shared between FSM and Palau on that one-third (Yap) two-thirds (Palau) basis, then the estimated OPEX costs (not including the costs of spares) would have been 0.4 million, which is higher (and would have led to higher bandwidth prices) than what is now proposed under the revised SEA-US option.

16. The revisions also provide for a small reduction in the OPEX estimate for the Chuuk-Pohnpei cable system. The calculation provides for an estimation based on CAPEX elements quoted by NEC (pricing in turn based on the component prices offered by NEC to SEA-US). The revised OPEX estimates for Chuuk includes marine maintenance and landing station maintenance. However, if FSM were to decide not to include such maintenance contracts for Chuuk, then OPEX costs would be further reduced. Savings on general cable management fees have been realized due to the fact that the Chuuk Pohnpei cable system will be operated by the same entity as the Yap cable system. It is also noted that if the OPEX costs for Chuuk were based on the actual costs incurred by FSMTC in respect of its operation of its connection for Pohnpei via HANTRU1, then an amount of approximately \$0.1 million could be expected—covering the costs of storing spares (\$0.08 million) and the marginal costs of extending the NOC on Pohnpei to operate the Chuuk landing (\$0.02). The total costs incurred by FSMTC for its HANTRU1 connection for Pohnpei totals approximately \$0.25 million per annum.

17. Tables 1 and 2 show the impact for Yap and Chuuk states under the revised project arrangements utilizing the SEA-US option. It assumes a decreasing pricing structure of 3 percent per annum in bandwidth price.

Table 1. Financing Assumptions for Yap

		Before revised arrangements	After revised arrangements
Project characteristics	CAPEX	\$22.5M	\$15.6M ²
	OPEX	\$0.3M	\$0.383M ³
	IP transit cost	\$100Mbps	\$100Mbps
Three states combined	Price for bandwidth	\$345/Mbps/mth	\$357/Mbps/mth ⁴ or \$333/Mbps/mth (bundled OPEX)
	State contribution to NPV=0	\$0.03M	-\$0.9M
Yap as a standalone activity	Price for bandwidth	\$344/Mb/mth	\$399/Mb/mth or \$324/Mbps/mth (bundled OPEX)
	Profitability	\$0	\$0

Table 2. Financing Assumptions for Chuuk

		Before revised arrangements	After revised arrangements
Project characteristics	CAPEX	\$18.5M	\$23.5M
	OPEX	\$0.3M	\$0.28M
	IP transit cost	\$80/Mbps	\$80Mbps
Three states combined	Price for bandwidth	\$345/Mbps/mth	\$357/Mbps/mth or \$333/Mbps/mth (bundled OPEX on Yap cable)
	State contribution to NPV=0	\$3.3M	\$4.2M
Chuuk as a standalone activity	Price for bandwidth	\$255Mbps/mth	\$244/Mbps/mth
	Profitability	\$0	\$0

² This includes: an IRU at \$4.66 million for the transport on main cable, \$9.38 million of spur costs, \$0.5 million for landing station and 0.6 for spares in Yap, and \$0.5 million of project management costs (noting that the costs of spares were not included in the CAPEX estimates as originally appraised).

³ This includes: IRU OPEX at \$0.233 million, and Spur/Landing Station (including holding costs for spares which were not included in the original calculations), NOC OPEX at \$0.15 million.

⁴ The price for all three states combined depends upon the assumptions for the cost of the Chuuk to Pohnpei cable system.

Economic Analysis: Yap Cable System

18. The economic impact of the Yap cable system project is assessed by estimating the impact on GDP of the next 25 years. The cumulated discounted impact on GDP⁵ over the next 25 years is \$26.4 million (with a 6 percent discount rate). Therefore, considering that the initial investment is \$15.6 million, the net economic impact of the project is \$10.8 million. The economic rate of return is 11 percent. This analysis is based on the assumption that broadband penetration (including mobile Internet) will rise from 1 percent to 46 percent within 10 years due to the submarine cable, and data indicating that a 10 percent increase in broadband penetration (wireless Internet + broadband) correlates with a 1.38 percent increase in GDP in developing countries.⁶ No assumptions are made about the impact of the cable beyond 25 years which is beyond the term of the IRU.

Economic Analysis: Chuuk Pohnpei Cable System

19. The economic impact of the Chuuk Pohnpei cable system is assessed by estimating the impact on GDP of Chuuk of the next 25 years. The cumulated discounted impact on GSP over the next 25 years is \$26.4 million (with a 6 percent discount rate), based on the assumption that broadband penetration would increase to 27 percent within the next 10 years. Therefore, considering that the initial investment is \$23.5 million, the net economic impact of the project is \$2.9 million. The economic rate of return is 7 percent. If the cable were to last a further 10 years (35 years in total), the net economic impact would be \$7.6 million, and the economic rate of return would be 8 percent. This analysis is based on the correlation between broadband penetration and GDP growth described above.

20. Table 3 shows net economic impacts of the two cable systems before and after the revised arrangements. Overall, it is observed that a gain of \$1.2 million could be achieved under the revised arrangements.

Table 3. Economic Impact Before and After the Revised Arrangements

Project	Net Economic Impact/ ERR	
	Before revised arrangements	After revised arrangements
Yap Cable System	\$5.0M / 8%	\$10.8M / 11%
Chuuk - Pohnpei	\$7.5M / 9%	\$2.9M / 7%

⁵ The GDP impact already takes into account operational costs for cable system (but excluding the potential gains of a one-off purchase of OPEX for Yap for the first 10 years).

⁶ This conclusion has been drawn by a World Bank study “Economic impact of Broadband” from Christine Zhen-Wei Qiang and Carlo M. Rossotto with Kaoru Kimura dated on 2009. This ratio is quite conservative especially for Pacific Islands as populations are usually concentrated in the main cities and this concentration is supposed to improve the level of impact of a submarine cable which is landing directly in the main city.

Environment

21. The restructured project no longer proposes the joint construction by Palau and FSM of a standalone cable from Guam to Palau with a spur to Yap. A new—lower impact—solution has been identified. FSM would construct a spur linking Yap to the SEA-US cable system and would buy capacity on the SEA-US cable system connecting Yap to the global telecommunications network via an existing landing facility on Guam (a United States Territory). By using capacity on SEA-US, rather than building a duplicate standalone cable system, these revised implementation arrangements would reduce costs, project management risks and social and environmental impacts significantly. The SEA-US consortium has selected NEC Corporation of Japan (NEC) to construct the SEA-US cable system. NEC would also construct the spur for FSM connecting Yap to the SEA-US cable system. SEA-US and NEC are reputable international operators and accordingly major environmental risks on the applicable deep-sea cable segment used to supply capacity to FSM are not anticipated. It is understood that NEC's Submarine Network Division is ISO9001 compliant, is a member of the International Cable Protection Committee (ICPC) and adheres to ICPC recommendations.

22. The lateral connecting cable to landfall in Yap is approximately 262 km in length, connecting to the main SEA-US cable beyond 1,000 m isobath. This is well beyond the territorial seas and contiguous zone of FSM, and well off the continental shelf. Deep ocean fiber optic cables are no larger than 17-21 mm diameter—about the size of a domestic garden hose—and are laid mainly upon the surface of the ocean floor. No specific environmental studies are undertaken for submarine cables which lie in deep sea. However, prior to laying cables, a detailed Cable Route Survey is done to ensure that the cable is not located in high risk locations or geological features (e.g., thermal vents) that often harbor unique faunal assemblages at abyssal depths. The ICPC publishes recommendations on key issues such as cable routing, cable protection and cable recovery and prescribes strict environmental standards. Extensive studies that are undertaken by cable suppliers prior to final cable laying work as effective safeguards against any possible environmental disruption, since in large part they are intended to identify routes for the cable that will avoid seamounts, volcanoes, canyons, vents, seeps, deep water reefs, dissected terrain—all areas that tend to be associated with higher biological value than the general abyssal plain.

23. The lateral cable spur between the main SEA-US cable and Yap would land in Yap at the existing appraised and approved landing site (or as otherwise documented in the project ESMF). The SEA-US cable system which would supply capacity to Yap between the branching unit and Guam will follow the same route and installation methodology as originally appraised. FSM will have no control or influence over the design, installation or functioning of the SEA-US cable. Nor will FSM contribute to the financial or technical feasibility of the SEA-US cable. The spur for Yap would likely be placed in the center of the shipping channel to the bridge, by Colonia harbor and then into Chamorro Bay, outside of the marine conservation areas, to the state-owned landing area and facility site. For Chuuk, it will likely be the corridor from the Guam-Pohnpei cable junction skirting a number of atolls, also outside of the marine conservation zones, to the

North East end of the airport runway and then either to the existing FSMTC office or to the governor's complex via an existing easement.

24. The Initial Environmental Examination safeguards documentation prepared by the Recipient has indicated that in Yap, the inland location for the landing site, and the site for the cable station are on vacant government land and that the sites are not being used by other parties. No structures, crops, or productive trees will be used will be affected. No land acquisition will be required and no involuntary resettlement has been identified. The cable landing site in Chuuk is located adjacent to the airport and is currently being purchased by the state Government. The key issue here is to ensure that the compensation for this land is paid in full and that appropriate consultation has been carried out, that the compensation reflects the full replacement cost of this land and that no outstanding grievances exist in relation to this purchase. Both options for the actual cable station are located on Government owned land (one option is an FSM Telecom compound and the other is in the state Government headquarters of Michitiw). Existing government easements are proposed to be used to bring the fiber optic cable to the cable station.

25. FSM will revise its Environmental and Social Management Plan, included as part of its Initial Environmental Examination report, to provide for due diligence reporting on environmental and social management systems and instruments applied by SEA-US in connection with the construction of the segment of the SEA-US cable (BU3.b – Guam, figure 1 above) which will supply capacity to FSM, consistent with FSM's status as a customer of SEA-US and accepted commercial practices. It is noted that, as a purchaser of capacity from SEA-US under a contract for an IRU, FSM would have no influence or control over the activities of SEA-US or the design, installation or functioning of the SEA-US cable. All of the parts of the SEA-US cable south east of the branching unit that would connect Yap to SEA-US is outside the area likely to be affected by the project and does not fall within the area of influence of this Project. Any activities from Guam to Hawaii and beyond carried on by SEA-US is similarly outside the area of influence of this Project.

FSM CONNECTIVITY PROJECT – RESTRUCTURING PAPER

ANNEX 1. RESULTS FRAMEWORK AND MONITORING

Project Name: Pacific Regional Connectivity Program 2:Palau-FSM Connectivity Project (P130592)	Project Stage: Restructuring	Status: DRAFT
Team Leader(s): James L. Neumann	Requesting Unit: EACNF	Created by: Andrea Ruiz-Esparza on 04-Dec-2015
Product Line: IBRD/IDA	Responsible Unit: GTI09	Modified by: James L. Neumann on 15-Dec-2015
Country: Micronesia, Fed	Approval FY: 2015	
Region: EAST ASIA AND PACIFIC	Lending Instrument: Investment Project Financing	

Project Development Objectives

Original Project Development Objective:

The development objective of the Project is to reduce the cost and increase the availability of ICT services needed to support social and economic development in the Recipient's territory.

Results

Core sector indicators are considered: Yes

Results reporting level: Project Level

Project Development Objective Indicators

Status	Indicator Name	Core	Unit of Measure		Baseline	Actual(Current)	End Target
No Change	Access to telephone services (mobile phones per 100 people)	<input type="checkbox"/>	Number	Value	30.00		80.00
				Date	25-Sep-2014		31-Jan-2020
				Comment			

No Change	Access to Internet Services (number of subscribers per 100 people)	<input checked="" type="checkbox"/>	Number	Value	2.00		40.00
				Date	25-Sep-2014		31-Jan-2020
				Comment			
No Change	Wholesale Internet bandwidth price	<input type="checkbox"/>	Number	Value	1800.00		700.00
				Date	25-Sep-2014		31-Jan-2020
				Comment			
No Change	Direct project beneficiaries	<input checked="" type="checkbox"/>	Number	Value	0.00		42000.00
				Date	25-Sep-2014		31-Jan-2020
				Comment			
No Change	Female beneficiaries	<input checked="" type="checkbox"/>	Percentage Sub Type Supplemental	Value	50.00		50.00
No Change	Internet bandwidth available (Mbps)	<input type="checkbox"/>	Number	Value	38.00		20150.00
				Date	25-Sep-2014		31-Jan-2020
				Comment			
No Change	Impact on Telecom sector of World Bank Technical Assistance (composite score: 1- low impact to 5-high impact)	<input checked="" type="checkbox"/>	Number	Value	2.00		5.00
				Date	25-Sep-2014		31-Jan-2020
				Comment			
No Change	Retail Price of Internet Services (per Mbit/s per Month, in US\$)	<input checked="" type="checkbox"/>	Amount(USD)	Value	65.00		20.00
				Date	30-Sep-2014		31-Jan-2020
				Comment			

Intermediate Results Indicators

Status	Indicator Name	Core	Unit of Measure		Baseline	Actual(Current)	End Target
Revised	Length of fiber optic cable access (km)	<input type="checkbox"/>	Kilometers	Value	0.00		1950.00
				Date	25-Sep-2014		31-Jan-2020
				Comment			
	Length of fiber optic cable built (km)	<input type="checkbox"/>	Kilometers	Value	0.00		2350.00
				Date	25-Sep-2014		31-Jan-2020
				Comment			
No Change	Regulatory capacity strengthened	<input type="checkbox"/>	Yes/No	Value	No		Yes
				Date	25-Sep-2014		31-Jan-2020
				Comment			