Asia-Pacific
Economic Cooperation

Performance-Based Navigation Regulatory Review and Evaluation Program (PBNRREVP)

Consolidated Site Visit Report

Transportation Working Group (TPTWG)
Aviation Experts Group (AEG)

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APEC Project TPT 06/2011A

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1. INTRODUCTION

The Asia-Pacific Economic Cooperation (**APEC**), through the Transportation Working Group (**TPTWG**), is funding the "Performance-Based Navigation Regulatory Review and Evaluation Program (**PBNRREVP**)" which aims to assist developing APEC member economies with meeting the International Civil Aviation Organization (**ICAO**) requirements to file a Performance-Based Navigation (**PBN**) Implementation Plan, and actively engage in following through with all aspects of implementation, particularly establishing the proper regulatory safety oversight of related procedures.

To execute this program APEC contracted The Ambidji Group (**Ambidji**) to coordinate the work of a team of experts on PBN to share safety oversight training and best practices with two member economies: Malaysia and The Philippines.

This report documents the outcomes of the two site visits, as well as Ambidji's observations and recommendations to facilitate successful PBN implementation in the future.

1.1 Background

Performance Based Navigation has proven enormous benefits to the aviation community, particularly with respect to conserving resources (i.e. saving fuel), reducing the environmental impact (i.e. reduced CO2 emissions and noise in populated areas due to more efficient flight routing) and reducing accidents (i.e. stabilized instrument procedures and increased accurate flight positioning). However, many APEC member economies are proceeding slowly with implementation, primarily due to lack of information or misinformation regarding international and domestic requirements for implementing related technologies and procedures.

To date, the ICAO PBN Task Force has made significant progress in developing PBN implementation guidance and establishing broad regulatory requirements. It has set ambitious regional goals for procedural implementation and regulatory oversight of related activities to be carried out by individual APEC member economies. The PBN Task Force has set deadlines for submitting plans to ICAO by the end of 2010 in line with ICAO Assembly Resolutions, established a PBN flight procedural design office in Beijing as a resource to all Asian ICAO member states, and acted as ICAO's review board for evaluating the quality and feasibility of each state's PBN implementation Plans.

Despite this level of ICAO support, many developing APEC economies are still struggling with successful PBN implementation plans, specifically the components of safety regulatory oversight, development of PBN procedures that would fit their airspace needs and establishing required equipage for local fleets.

1.2 Project Objectives

The overall project objective was to address the primary impediments to developing and implementing a robust PBN Implementation Plan. These include: a lack of clear guidance for regulatory oversight needs, standards and best civil aviation authority practices; difficulty developing the PBN procedures; and safely implementing procedures once developed. Emphasis was placed on providing additional guidance to assist in understanding the already-established international regulatory requirements and clarifying what domestic regulations and policy guidance needed to be developed for successful implementation.

The key objectives set for this project were to:

1. Ensure that the member economy PBN implementation plans were mature, included all necessary Basic Plan Elements (**BPE**) outlined in the Asia-Pacific Regional PBN Implementation Plan, as well as meeting the needs of local aviation stakeholders;

2. Create action plans for participants to follow through with PBN implementation activities that included further development of regulations and guidance material that may be needed; and

3. Provide training with respect to identifying common implementation challenges and how to overcome these with respect to developing PBN procedures, Flight Validation (**FV**), and the development of a common set of recommendations and strategies based on experience that can be used by participants to ensure successful PBN implementation.

1.3 Consolidated Report

This consolidated report summarises the PBNRREVP activities and outcomes in Malaysia and The Philippines.

Reports providing detailed descriptions of activities conducted and resultant findings for each site visit, including copies of relevant documents, are available on the APEC website.

- Report No.: APEC#212-TR-01.3: PBNRREVP Kuala Lumpur Malaysia, October 2012; and
- Report No.: APEC#212-TR-01.4: PBNRREVP Manila, The Philippines, November 2012.

2. PBNRREVP SITE VISITS

2.1 Conduct of Site Visits

The APEC PBNRREVP Team visited each member economy to implement the Program;

- Malaysia: 18 to 21 September 2012; and
- The Philippines: 5 to 9 November 2012.

2.2 Composition of APEC Team

The APEC Team consists of PBN experts including:

- Mr Robert Kennedy (Ambidji Group) Project Coordinator;
- Mr Noppadol Pringvanich, Director, Procedure Design for Air Navigation Services, AEROTHAI and Manager, ICAO Asia Pacific Flight Procedures Programme, Beijing;
- Mr Kazuto Shiba, Manager Route Planning, All Nippon Airways Co., Ltd (**ANA**);
- Mr Tass Hudak, The Mitre Corporation.

The APEC Team in The Philippines

Left to Right: Mr Shiba Kazuto (ANA), Mr Robert Kennedy (Ambidji), Mr Andy Basalotte (CAAP), Mr Noppadol Pringvanich (AEROTHAI), Mr Tass Hudak (Mitre Corporation)

3. ON-SITE ACTIVITIES AND OUTCOMES - MALAYSIA

3.1 PBN Implementation Status Summary

At the time of the site visit, Malaysia not made significant progress toward implementation of PBN and a regulatory framework for PBN had not been developed. Some training had been completed by instrument flight procedure design staff and flight operations inspectors.

To date only two Required Navigation Performance Approach Lateral Navigation (**RNP APCH LNAV**) procedures have been published in Malaysia, and these procedures are in need of review.

Air Asia has contracted GE Aviation to design RNP Authorisation Required (**RNP AR**) approach and departure procedures at all 15 airports serviced by Air Asia in Malaysia.

*Malaysia Airlines (**MAS**)* has commenced operations into Kathmandu and consequently intends to seek RNP AR operational approval for its B737-800NG fleet as a matter of priority.

In the two weeks immediately prior to the APEC Team's visit the ICAO Asia Pacific (**APAC**) Flight Procedures Program (**FPP**) and the ICAO Cooperative Development of Operational Safety and Continued Airworthiness Programme (**COSCAP**) – South East Asia (**SEA**) conducted PBN activities:

- COSCAP-SEA conducted a PBN Operational Approval Course that was attended by Malaysia Department of Civil Aviation (**DCA**) staff and a number of airline personnel between 3 and 7 September; and
- ICAO FPP, in association with COSCAP-SEA, conducted a PBN Implementation Workshop between 11 and 13 September.

The most significant impediment to progress in Malaysia is a lack of PBN-trained instrument fight procedure designers.

3.2 Attendance

The program was very well attended with 55 representatives from Malaysia DCA and all sectors of the Malaysian aviation industry, including military and general aviation.

Feedback from attendees was very positive indicating that respondents considered the program to be extremely useful. Notable amongst the comments received is the view that follow-up is required to maintain the Malaysian PBN Implementation Plan.

3.3 Program Activities

PBN Briefing

A briefing outlining the Principles of Performance Based Navigation was presented.

Review of Malaysian PBN Regulatory Provisions

No PBN regulations had been drafted and reliance to date has been on Civil Aviation Regulation (**CAR**) 59.

Under the guidance of the APEC Team, a draft Aeronautical Information Circular (**AIC**) was developed during the session which, subject to legal review, will provide a basis for the implementation of PBN in Malaysia.

Provisions were included in the draft AIC to permit operators who currently hold PBN approvals to continue to operate for a period prior to being required to demonstrate continued compliance with the ICAO PBN Manual by 31 December 2013.

Review of Malaysia DCA AIC 110/2005 – RNAV Approach for Global Navigation Satellite System (GNSS)

This AIC was reviewed and it was recommended that the AIC be updated to reflect changes in terminology and clarify changes.

Recommendations:

- *Update the AIC to reflect the ICAO PBN Manual;*
- *Remove reference to Supplemental means; and*
- *Issue an AIC to inform operators of PBN transition plans*

Flight Operations Inspector Training

Two Malaysian Flight Operations Safety Inspectors (**FOSI**) have completed PBN Operational Approval Training although there is no framework to qualify inspectors. It was suggested that Malaysian FOSIs enlist the help of personnel with prior experience in approving specific operations, such as COSCAP-SEA.

Recommendations:

- *DCA update the Flight Operations Safety Inspector (FOSI) Handbook to include the periodic oversight and surveillance of PBN operations and training; and*
- *DCA revise the requirements to authorize FOSIs to ensure they meet the PBN requirements*

DCA Procedure Design

PBN Implementation in Malaysia is at risk due to a serious lack of procedure design capability in Malaysia DCA. Action needs to be taken urgently to increase permanent staffing and to provide additional training.

Third Party Designer Authorization

Malaysia has two projects in progress which will involve the use of third party procedure designers, Kuala Lumpur International Airport (**KLIA**) 2 redevelopment and Air Asia/GE Aviation RNP AR.

The KLIA 2 project, administered by Malaysia DCA, involves the redevelopment of airspace in Western Malaysia and includes the design of new instrument flight procedures throughout the Flight Information Region (**FIR**).

The Air Asia project will provide RNP AR procedures at all 15 airports serviced by Air Asia within Malaysia and procedures design will be completed by GE Aviation.

Recommendations:

- *DCA requires third party designers to provide evidence of qualifications accepted by another contracting State;*
- *DCA issues an interim authorisation to third party designers who provide acceptable evidence of qualification;*
- *The requirements for the authorization of third party designers is set out in an AIC (or other document);*
- *Third party designers must demonstrate compliance with ICAO Doc 9906;*
- *The Procedure Design Group (**PDG**) should not be responsible for authorization of third party designers. The PDG may draft the requirements and provide them to the Auditing department, but it should be the responsibility of the Auditing/Inspection department to authorize the third party;*
- *FV should be implicitly required by the process with supporting output and documentation of FV results. The FV pilot/department should provide some level of oversight or participation to ensure that the necessary steps are taken.*

In order to commence the process of authorization of third party designers, the APEC Team provided assistance to draft a suitable AIC to provide interim authorization of designers based on recognition of approval by another State.

Procedure Design Validation

The process for the validation of instrument flight procedures was reviewed. The primary responsibility resides with the Malaysian Flight Calibration Unit. One pilot has

completed ICAO FV Pilot Training but Malaysian DCA has yet to develop policy on FV Pilot Qualifications in accordance with ICAO Doc 9906.

PBN Implementation Plan

Revision of the Malaysia PBN Implementation Plan is required to enable the Malaysia PBN Implementation Plan to be assessed by the ICAO Regional Office as "robust".

The APEC Team reviewed the Basic Plan Elements (**BPE**) and recommended revisions to the Plan which should be submitted to ICAO one to two weeks prior to the next PBN Task Force meeting late in 2012.

Air Traffic Management

Major projects involving Air Traffic Services (**ATS**) in Malaysia include:

- Air Asia implementation of RNP AR at 15 airports;
- KLIA 2; and
- Establishment of RNP 2 routes.

To date Malaysian Air Traffic Control (**ATC**) has received no PBN training, however general training is planned in October and November before Air Asia starts RNP AR operations. The contract between Air Asia and GE Aviation does not cover ATC training.

Recommendations:

- *ATC develop methods of sequencing RNP approach traffic with Instrument Landing System (**ILS**) traffic. This is necessary to ensure that the Air Asia RNP AR Project achieves efficiency benefit. Experience gained in Brisbane, Australia should be considered;*
- *A phased implementation of RNP AR approaches is adopted with initial operations restricted to day Visual Meteorological Conditions (**VMC**) to provide controllers with the opportunity to become familiar with and with RNP AR operations before conducting Instrument Meteorological Conditions (**IMC**) operations;*
- *All ATC personnel complete a generic PBN training program; and*
- *DCA reviews and updates the ATS manual to include PBN provisions.*

3.4 Summary

The PBNRREVP Team visit to Malaysia has provided Malaysia with a sound foundation upon which to pursue the implementation of PBN. The program was very well supported and all sections of the industry contributed enthusiastically.

Building on ICAO FPP and COSCAP-SEA programs the APEC PBNRREVP has provided Malaysia with the tools to proceed. Basic regulatory provisions were drafted to enable the authorization of PBN operations and procedure design, recommendations made to complete the Malaysia PBN Implementation Plan and participants shared in developing their knowledge of PBN and its application in the Malaysian environment.

The regulatory provisions drafted during the visit are the minimum necessary to proceed. As Malaysia DCA gains experience and additional staff are trained, further development of regulatory documentation will be required.

While the implementation of PBN in Malaysia has been limited to date, all stakeholders have expressed the intention to actively pursue their respective responsibilities. In order for Malaysia to meet the schedule for implementation in accordance with ICAO Resolution A37-11 prompt action is required to overcome some significant difficulties that exist.

It is expected that Malaysia DCA will require continued assistance from APEC and other agencies over the next one to two years in the following areas:

- Development of detailed regulatory documentation; and
- Procedure design training and documentation.

3.5 Key Action Items

Immediate action is required in the following key areas:

1. The AICs drafted during the APEC Team visit need to be completed and published to provide a regulatory framework for PBN implementation.

2. Further training is required to provide additional qualified DCA FOSIs. Although the current FOSIs are trained and competent, the anticipated workload can be expected to exceed capacity and cause delays in implementation.

3. The lack of sufficient PBN-trained procedure design staff is a significant risk to Malaysia achieving timely implementation.

4. Establishment of a process to ensure that procedure design, including internally by DCA and third party designers, is completed in accordance with ICAO Doc 9905 *The Quality Assurance Manual for Flight Procedure Design*.

5. The training of ATC staff must be completed as planned and in a timely manner to ensure that there is no delay to the implementation of PBN procedures.

6. The Malaysia PBN Implementation Plan should be revised in accordance with the recommendations made during the APEC visit and resubmitted to the Regional ICAO PBN Task Force.

7. Malaysia DCA should publish information to advise the Industry (domestic and foreign) of the Malaysia PBN implementation strategy and timeline.

4. ON-SITE ACTIVITIES AND OUTCOMES – THE PHILIPPINES

4.1 PBN Implementation Status Summary

The Philippines has made considerable progress in PBN implementation. Instrument Flight Procedure Design staff have completed PBN training and are well engaged in the design of instrument flight procedures in accordance with the Philippines PBN Implementation Program.

Flight Operations Inspectors responsible for the major carriers (Philippine Airlines and Cebu Pacifica) have completed PBN training but inspectors oversighting the majority of operators have yet to commence training.

Air Traffic Services (**ATS**) has completed some limited training at specific airports however general PBN training to all ATS staff is yet to be carried out.

The Aerodrome and Air Navigation Safety Oversight Office (**AANSOO**) is not well prepared to carry out their role with respect to PBN and require training.

Good progress has been made with the development of regulatory provisions relating to PBN although some revision and updating is required.

The major Philippine operators, Philippine Airlines (**PAL**) and Cebu Pacific have been issued with approvals to conduct the majority of PBN operations although there is a lack of documentation on the approval process and the operational status of those carriers is in need of review. Other Philippine carriers are not qualified for PBN and there is an urgent need to engage those operators on obtaining PBN approvals in order to realise the benefits of PBN.

The most significant impediment to PBN implementation in The Philippines is the lack of trained flight operations inspectors in the Flight Operations Department.

4.2 Attendance

The program was very well attended with a total of 48 persons including 33 Civil Aviation Authority of The Philippines (**CAAP**) staff and 15 airline representatives.

Feedback from attendees was very positive indicating that respondents considered the Program to be extremely useful. Notable amongst the comments received is the view that continued training and regular review is required to assist in maintaining The Philippines PBN Implementation Programme.

4.3 Program Activities

PBN Implementation Review

A review was conducted of PBN Implementation in The Philippines and CAAP staff provided a number of presentations.

Flight Procedure Design

The design of PBN Instrument Flight Procedures (**IFP**) is on track in accordance with the priorities determined by the FPP/COSCAP PBN Implementation Workshop conducted in Manila in October 2011.

Several pilots from the Flight Inspection and Calibration Group (**FICG**) attended the FPP Flight Validation Pilot Course conducted in Manila in June 2012.

The Airspace and Flight Procedure Design Division (**AFPDD**) identified several issues which were discussed and guidance provided.

Philippines PBN Implementation Plan Review

The latest version of the Philippines PBN Implementation Plan was reviewed. The Philippines PBN Implementation Plan has been assessed by the ICAO Regional PBN Task Force as robust which is a significant achievement.

Several recommendations were made to update the Plan to conform to the 4th Edition of the ICAO PBN Manual.

It was recommended that CAAP issues an Aeronautical Information Circular (AIC) to advise operators that SIDs and Stars will be re-issued as RNP 1, providing sufficient time for operators to comply.

Philippines National PBN Working Group

A National PBN Working Group had been established but meetings have been held irregularly.

Recommendations:

- *The National PBN Working Group convenes regularly to review PBN Implementation progress;*

- *One of the tasks of the Working Group should be to review and update the PBN Implementation Plan.*

Recommended Amendments to Regulatory Documents

The relevant sections of CAAP regulatory documents were reviewed and amendments proposed.

- Philippines Civil Aviation Regulations
  - Part 7 Instrument and Equipment
  - Part 8 Operations
  - Part 9 Air Operator Certification and Administration
- Advisory Circular (AC) 08-007 Application and Process: Performance-Based Navigation
- Draft Policy Statement: Flight Validation

Airline Operations

The PBN status of Philippine operators was reviewed. Although some Philippine carriers have PBN Operational Specifications (**OPSPEC**), the issue of PBN approvals is not supported by available records detailing the process for authorisation.

No operational approvals have been issued by the Flight Operations Division (**FOD**), which is responsible for all operators except Philippine Air Lines and Cebu Pacific Air Airlines. No FOD inspectors have been trained in PBN operational approval.

Recommendations:

- *CAAP and Airlines review PBN documentation, training and operations in order to ensure continued conformance to the ICAO Performance-Based Navigation Manual;*
- *CAAP conducts the review within a reasonable time frame such as the end of 2013;*
- *CAAP does not withdraw any existing approvals pending the review;*
- *Inspectors from the FOD undertake PBN Operational Approval training as soon as possible;*
- *CAAP review the Operating Specification PBN endorsements to conform to ICAO Navigation Specification abbreviations.*

FSIS Operational Responsibilities

The structure and responsibility for PBN Operational Approval by Flight Standards Inspectorate Service (**FSIS**) was reviewed. PAL and Cebu Pacific Air are the

responsibility of the Certification Management Department (**CMD**), and a number of Inspectors have attended COSCAP Operational Approval Training.

The FOD is responsible for a large number of operators but no FOD inspectors have been trained in PBN Operational Approval.

Recommendations:

- *FOD inspectors attend the next available Operational Approval Course as a matter of urgency;*
- *CMD inspectors who have completed training provide assistance and On-the-Job Training (**OJT**) experience for FOD inspectors.*

Note: Discussions between CAAP and FPP/COSCAP have been initiated and it is proposed that CAAP hosts a COSCAP PBN Operational Approval Course early in 2013. The course is to be open to other States in the Region.

Validation

The validation process as described in ICAO Doc 9906 *Quality Assurance Manual for Flight Procedure Design* was explained by the APEC Team.

The APEC Team advised that irrespective of the person that conducted the validation (CAAP/Airline/Third Party) the responsibility to ensure the process was completed remains with the State. It was also noted that the State has the power to change the regulation and issue guidance on when flight validation is required.

Recommendation:

- *CAAP establishes a process for the administration of instrument flight procedure validation.*

GNSS Availability Prediction

The requirement for CAAP to provide an RNP availability prediction service was discussed and several systems operating in a number of economies were considered.

Recommendations:

- *The Philippines participate in the Regional programme being developed by AEROTHAI and the International Air Transport Association (**IATA**);*
- *CAAP should determine if a public service is to be provided or operators will be required to provide their own prediction services.*

ICAO PBN Documentation Update

Mr Noppadol Pringvanich demonstrated the use of the ICAO PBN in a Box electronic information package and the availability of ICAO PBN documents on the ICAO website including the recent publication of ICAO Doc 9997 *PBN Operational Approval Manual*.

PBN Operations Manila (NAIA)

The situation at Ninoy Aquino International Airport (**NAIA**) where operations are dependent upon PBN approaches when the Instrument Landing System (**ILS**) is not available was discussed. Currently, although PBN approaches are available, only a few operators are approved to conduct RNP APCH operations. CAAP should consider mandating PBN approach capability as a requirement for operations at NIAA.

Recommendation:

- *CAAP publishes a notice (AIC) to advise operators of minimum equipment/PBN requirement to operate in Manila airspace by a date TBD by CAAP.*

Operator PBN Capability

Concern was expressed that when the ILS is out of service at Manila, ATC may not be aware of the PBN capability of operators and CAAP Flight Operations had been asked to provide a list of capable operators. The response from flight operations and a number of OPSPECs were examined. It was evident that the information provided to ATS was not complete or accurate and that some OPSPECs were not correctly annotated and, therefore, operational capability was not clearly established.

Mandate for PBN Capability

The APEC Team suggested that the consequences of outages to conventional navaids at Manila may warrant the mandating of RNP APCH capability so that operations can be continued with minimum disruption. Examples of other States' proposals for requiring PBN capability such as Hong Kong and Indonesia were provided.

ATC Training

Training for ATCs has been provided at airports where PBN procedures are being implemented. To date the training has been provided by flight procedure designers although there are plans for this work to be undertaken by the ATC training section.

At present a "train the trainer" model is being applied to provide training initially only to ATS managers, who are expected to take this knowledge back to their area of responsibility.

The APEC Team outlined the training required for air traffic controllers and noted that "core training" has not yet been provided in The Philippines. ATS expects to have a core training program for controllers by 2013.

Recommendation:

- *All ATCs receive PBN core training as soon as possible.*

ATS Oversight

In order for the AANSOO to provide competent oversight of PBN operations and flight procedure design and implementation there is an urgent need for AANSOO staff to undertake appropriate training.

IFP Design Regulatory Structure

The group discussed the need for a regulatory environment that ensures that both the government design office and commercial designers conform to the guidance in ICAO Doc 9906 *Quality Assurance Manual for Flight Procedure Design*.

Administration of Third Party Designers

Several models employed by a number of States were discussed. The process used in Australia (Civil Aviation Safety Regulation CASR Part 173) which requires the State, as well as third party design organisations, to obtain an IFP design certificate was explained.

Recommendations:

- *The Philippines adopt a similar structure to other States to authorise the design of IFPs including procedures designed by third party designers;*
- *In the interim, CAAP issues a limited authority to designers subject to formal approval by a reasonable date by which time all design organisations should be required to obtain formal authorisation by CAAP within two years.*

4.4 Summary

The PBNRREVP Team visit to The Philippines has been an excellent opportunity to review the considerable progress already made in The Philippines and to move forward with the development of a sound regulatory environment for the implementation of PBN.

The Program was very well supported and all sections of the CAAP and a number or airlines contributed enthusiastically.

While progress has been made in The Philippines there remains considerable work to be completed. The design of IFPs is proceeding on target to achieve the timeline set

by ICAO for PBN implementation; however there are significant issues relating to flight operations, particularly within the Flight Operations Department and AANSOO.

CAAP has developed a regulatory framework which provides a good foundation. The APEC PBNRREVP Team site visit, supported by excellent participation of CAAP staff and airline personnel, has enabled considerable progress to be made in the further development of the regulatory provisions. The APEC Team regulatory review has resulted in the recommendation of a number of amendments to the Philippine Civil Aviation Regulations, Advisory Circular 08-007 and the Manual of Special Operations Approvals.

4.5 Key Action Items

Action is required in the following key areas:

1. Training for flight operations inspectors in the Flight Operations Department is urgently required.

2. Amendment to The Philippine Civil Aviation Regulations (**PCAR**), AC 08-007 and Manual of Special Operational Approvals Chapter 5 is required.

3. CAAP should consider the mandating of PBN capability in order to minimise disruption at key airports when conventional navigation systems are unavailable.

4. CAAP should establish a regulatory process to ensure that procedure design, including design by internal and third party designers is completed in accordance with ICAO Doc 9906 *Quality Assurance Manual for Flight Procedure Design.*

5. The training of ATC staff must be completed as planned and in a timely manner to ensure that there is no delay to the implementation of PBN procedures.

6. The Philippines PBN Working Group should convene regularly to support and monitor the implementation of PBN.

7. CAAP should publish information to advise the Industry (domestic and foreign) of the Philippines PBN Implementation strategy and timeline.

8. CAAP should actively encourage air operators to obtain PBN operational approval in order to obtain tangible benefits from the PBN Implementation Program.

5. PBNRREVP – PROGRAM EVALUATION

The PBNRREVP was well supported and feedback indicates that the Program has been essential to the successful implementation of PBN in both member economies.

While the circumstances in each member economy varied significantly, the Program has been sufficiently flexible to provide effective assistance in both cases.

Both member economies suffer from a general lack of PBN experience and knowledge and this makes it extremely difficult for progress to be achieved. The provision of expert advice and assistance under the APEC PBNRREVP is an enabler, which will accelerate the rate of progress in Malaysia and The Philippines.

The Program arrangements including initial consultation with the member economies to determine their specific needs, and the on-site activities conducted by the APEC Team are considered to be appropriate. The PBNRREVP APEC Team adopted a hands-on approach and included in-session drafting of new regulatory documents and numerous revisions to existing regulatory documentation. This method encouraged participation by the attendees and provided significant learning opportunities for attendees and resulted in draft documentation being prepared which otherwise may have taken considerable time for local staff to develop.

6. FUTURE APEC ROLE IN SUPPORTING PBN IMPLEMENTATION

A number of participants highlighted a continued need for support for PBN development. While the Program has been successful in providing a significant impetus to PBN in both member economies, ongoing support is considered essential for long term success. Common impediments to progress include the lack of trained staff, a general low level of PBN experience and knowledge, and a consequent lack of confidence.

The common experience of the APEC Team is that, throughout the Asia Pacific Region, most States are experiencing considerable difficulty in PBN implementation, typically for the same reasons as Malaysia and The Philippines. Importantly it is necessary to recognise that, despite a number of programs aimed at assisting with PBN awareness and training, continued support is needed. Ongoing technical advice, training, monitoring of progress, as well as general support and encouragement, will be required for some years to enable most member economies to be successful within the ICAO timeframe for PBN implementation.

It is recommended that APEC considers extending the PBNRREVP to other member economies, and considers the provision of ongoing support to Malaysia and The Philippines. It is suggested that an annual follow-up, perhaps by a smaller team would be appropriate.

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