



International Civil Aviation Organization

**The Third Meeting of the APANPIRG ATM Sub-Group  
(ATM /SG/3)**

Bangkok, Thailand, 03-07 August 2015

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**Agenda Item 4: ATM Systems (Modernisation, Seamless ATM, CNS, ATFM)**

**FPL 2012 FUNCTIONAL IMPLEMENTATION SURVEY**

(Presented by the SECRETARIAT)

**SUMMARY**

This paper presents the results of a survey of functional implementation status of Amendment 1 to ICAO Doc 4444 – PANS-ATM, which became effective in November 2012.

**1. INTRODUCTION**

1.1 Amendment 1 to the 15<sup>th</sup> Edition of ICAO Doc 4444 – *Procedures for Air Navigation Services – Air Traffic Management* (PANS-ATM) came into effect on 15 November 2012. The amendment was generally known as *FPL 2012*. The purpose of the amendment was to update the ICAO model flight plan form in order to meet the needs of aircraft with advanced capabilities and the evolving requirements of automated air traffic management (ATM) systems.

1.2 The 24<sup>th</sup> Meeting of the Asia/Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG/24, June 2013) adopted the following Conclusion:

***Conclusion 24/11: Reliance on FPL and ATS Message Converters***

*That, considering the airspace capacity, efficiency and safety benefits intended by the full implementation of PANS/ATM Amendment 1 changes, States are urged to:*

- a) *report to the ICAO Asia/Pacific Regional Office the:*
  - i. *current status of ATM automation and conversion systems; and*
  - ii. *planned date of implementation of full capability to process NEW format FPL and ATS messages without conversion; and*
- b) *where converters are utilized, upgrade ATM Automation and supporting systems to fully support Amendment 1 changes without using converters.*

1.3 The issue was further discussed by APANPIRG/25 in September 2014, noting IATA's presentation of the results of a CANSO post-implementation survey of FPL 2012. It was agreed that the ICAO Asia/Pacific Regional Office would conduct a follow-up survey.

1.4 Administrations responding to the survey were Australia, Bangladesh, Hong Kong, China, Fiji, Japan, Malaysia, New Zealand, Pakistan, Papua New Guinea, Philippines, Singapore, Sri Lanka, Thailand, USA and Viet Nam.

## 2. DISCUSSION

### Amendment 1 to the 15<sup>th</sup> Edition of ICAO Doc 4444 – PANS-ATM

2.1 Among the changes introduced to the ICAO Flight Plan by Amendment 1 were:

- Item 10 – Radio communication, navigation and approach aid, and surveillance equipment and capabilities; and
- Item 18 – Other Information:
  - PBN/ [RNAV and/or RNP capability, expanding upon Item 10 navigation, communication and surveillance capability indicators];
  - DOF/ [Date of Flight, permitting FPL lodgment up to 120 hours in advance of the Estimated Off Blocks Time]

2.2 A significant number of Asia/Pacific Administrations elected to implement down-converters<sup>1</sup> as a cost-effective interim solution for the initial transition to FPL 2012, pending the implementation of full processing capability. Down-conversion of new format FPL into old format does not provide the opportunity for operational use of the new FPL information in ATM automation systems.

2.3 In the case of systems upgraded to accept and process new version FPL without the need for down-conversion, it was anticipated that system capability would be enhanced to provide improved information to ATC, and to implement ATC tools to accommodate PBN-based separation of aircraft.

2.4 The *ICAO Asia/Pacific Region FPL Functional Implementation Survey for 2015 (Attachment A)* was distributed to all Asia/Pacific administrations under State Letter AP049/15 (ATM) on 16 April 2015, with responses requested by 1 June 2015. Responses were received from 15 administrations, and are collated in **Attachments B and C**. The responses from the 15 respondent administrations to selected key questions related to down-conversion and the processing and display of information introduced in Amendment 1 may be summarized as follows:

2.5 **Down Conversion:**

- 4 administrations reported using down-converters. Of these, 3 States were down-converting FPL and ATS messages input to the ATM system flight data processor (FDP).

2.6 **Non-PANS-ATM Items:**

- Most administrations accept and process wake turbulence indicator ‘J’ for ATC display.
- Most States accepted both RVR and FPL item 19 without processing.

2.7 The meeting is invited to note that considerable numbers of FPL are being transmitted with item 19 incorrectly included, causing severe workload issues and consequential delays in FPL processing in cases where FPL including item 19 are rejected to an operator queue or to the originator.

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<sup>1</sup> “Down-converters” are retrofitted message converters utilized to accept new format FPL and ATS messages, and convert them to pre-Amendment 1 format for use in existing ATM and other supporting systems.

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2.8 **ATC HMI Indications – COM/NAV/APP Aids:**

- Few administrations provided GBAS landing system or LPV indicators in ATC HMI.
- Some administrations provided GNSS, Inertial Navigation, PBN approval and RVSM/non-RVSM indicators

2.9 **ATC HMI Indications – Surveillance:**

- Some administrations provide ADS-B equipage indicators in ATC HMI.
- Few provided for new Mode S SSR indicators.

2.10 **ATC HMI Indications – RNAV/RNP Capabilities:**

- Some administrations provide RNAV 10/RNP 10 and RNP 4 indications in ATC HMI.
- Few administrations provide RNP 5, RNP 2, RNP 1, RNP APCH or RNP AR indicators.

2.11 **ATM Processing and Display – Mode S/ADS-B DAPs:**

- Some administrations process and display Aircraft Identification (Flight Identification). Few process and display other DAPs.

2.12 **ATC Conflict Detection, Separation and Alerting Tools:**

- Some administrations provide conflict detection, separation and alerting tools for RNAV 10/RNP 10 and RNP 4;
- A few administrations report providing these tools for RNAV 5;
- No administrations provide these tools for RNAV 2 or RNAV 1.

2.13 **Processing FPL with EOBT more than 24 hours after submission:**

- Some administrations process the FPL and DOF;
- Few administrations process the FPL but disregard the DOF;
- Few administrations

2.14 The meeting is reminded that PANS-ATM provides lateral separation standards for RNAV 10/RNP 10, RNP 2 and RNP 1. These navigational performance specifications are also referenced in the performance objectives of the Asia/Pacific Seamless ATM Plan

2.15 The Asia/Pacific Seamless ATM Plan also references APV, RNP APCH, RNP APCH with LNAV and augmented GNSS (SBAS or GBAS)

2.16 It should also be noted that while PANS-ATM includes provisions for separation using RNP 2, the ICAO FPL defines RNAV 2, not RNP 2.

2.17 The use of Mode S SSR DAPs in ATC HMI and ATM automation system processing can provide significant safety and efficiency benefits. Many States have installed new or replacement Mode S-capable SSR, without enabling selective interrogations and/or the operational use of DAPs by ATC. The DAPs are also included in ADS-B downlink messages.

2.18 It should be noted that the relative benefits of display ACAS RA alerts to ATC are not yet clear, and any implementation would be heavily dependent on robust ATC procedures and training.

2.19 Proposed amendments to the Seamless ATM Plan, which will be updated in 2016, include the implementation of Mode S SSR interrogations and the use of DAPs.

2.20 The meeting is invited to consider the following Draft Conclusions:

**Draft Conclusion ATM/SG/3-X: Implementation of FPL 2012 Capability**

That, noting the relevant aircraft separation and track spacing minimums specified in ICAO Doc 4444 PANS-ATM, and the performance objectives of the Asia/Pacific Seamless ATM Plan;

States are urged to include in ATM automation system specifications the processing and presentation in ATC human-machine interfaces and decision support and alerting tools, the communications, navigation and approach aid indicators received in items 10 and 18 of FPL and ATS messages, where applicable, and the following Mode S SSR or ADS-B downlinked aircraft parameters:

- Aircraft Identification;
- Aircraft magnetic heading;
- Aircraft indicated airspeed or Mach Number;
- Pilot selected altitude.

**Draft Conclusion ATM/SG/3/X: FPL Item 19 Information**

That, States are urged to ensure that item 19 information contained in submitted flight plans is not included in FPL messages

**Draft Conclusion ATM/SG/3/X: Consistent PANS-ATM Provisions for RNP 2 and RNAV 2**

That, ICAO be requested to take action to provide consistency in ICAO Doc 4444 – PANS-ATM, noting the specification of RNP 2-based separation while RNAV 2 is specified for entry in the flight plan.

**3. ACTION BY THE MEETING**

- a) The meeting is invited to:
- b) note the information contained in this paper;
- c) discuss and agree to:
  - i) *Draft Conclusion ATM/SG/3-X: Implementation of FPL 2012 Capability;*
  - ii) *Draft Conclusion ATM/SG/3-X: FPL Item 19 Information;*
  - iii) *Draft Conclusion ATM/SG/3/X: Consistent PANS-ATM Provisions for RNP 2 and RNAV 2: and*
- d) discuss any relevant matters as appropriate.

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## ICAO Asia/Pacific Region Flight Plan (FPL) Functional Implementation Survey 2015

Amendment 1 to the 15<sup>th</sup> Edition of ICAO Doc 4444 – *Procedures for Air Navigation Services – Air Traffic Management* (PANS-ATM) came into effect on 15 November 2012. The purpose of the amendment was to update the ICAO model flight plan form in order to meet the needs of aircraft with advanced capabilities and the evolving requirements of automated air traffic management (ATM) systems.

The Amendment introduced a number of changes to the ICAO Flight Plan. Among the most significant were:

- Item 10 – Radio communication, navigation and approach aid, and surveillance equipment and capabilities; and
- Item 18 – Other Information:
  - PBN/ [RNAV and/or RNP capability, expanding upon Item 10 navigation, communication and surveillance capability indicators];
  - DOF/ [Date of Flight, permitting FPL lodgment up to 120 hours in advance of the Estimated Off Blocks Time]

A significant number of Asia/Pacific Administrations elected to implement down-converters<sup>1</sup> as a cost-effective interim solution, pending the implementation of full processing capability. Down-conversion of new format FPL into old format does not provide the opportunity for operational use of the new information in ATM automation systems.

In the case of systems upgraded to accept and process new version FPL without the need for down-conversion, it was anticipated that system capability would be enhanced to provide improved information to ATC, and to implement ATC tools to accommodate PBN-based separation of aircraft.

This survey follows up on the following Asia/Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG) Conclusion from its 24<sup>th</sup> Meeting in September 2012:

### ***Conclusion 24/11: Reliance on FPL and ATS Message Converters***

*That, considering the airspace capacity, efficiency and safety benefits intended by the full implementation of PANS/ATM Amendment 1 changes, States are urged to:*

- a) *report to the ICAO Asia/Pacific Regional Office the:*
  - i. *current status of ATM automation and conversion systems; and*
  - ii. *planned date of implementation of full capability to process NEW format FPL and ATS messages without conversion; and*
- b) *where converters are utilized, upgrade ATM Automation and supporting systems to fully support Amendment 1 changes without using converters.*

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<sup>1</sup> “Down-converters” are retrofitted message converters utilized to accept new format FPL and ATS messages, and convert them to pre-Amendment 1 format for use in existing ATM and other supporting systems.

In September 2014 APANPIRG/25 further discussed the issue:

Flight Plan 2012

3.2.1 IATA had presented the results of a CANSO post-implementation survey of ICAO FPL 2012 (Amendment 1 to ICAO Doc 4444 – PANS-ATM), with particular reference to the use of flight plan converter systems. The survey report commented on the use of converter systems, noting that while the proliferation of converter solutions had offered a practical and cost-effective **short-term** solution for States to meet the Amendment 1 implementation date, the benefits of new aircraft capability indicators in the ICAO FPL were lost in the backward conversion process. The survey report also stated that Air Navigation Service Providers (ANSPs) that had chosen to adopt the converter solution must not abandon plans to **migrate at an early date** to delivery of the full functionality of the PANS-ATM changes.

3.2.2 The ATM/SG/2 had discussed the need for a **new survey** to cover other aspects that had been noted as an issue (e.g.: item 10, alphanumeric call signs, use of the letter ‘J’ and the indicator RVR). ICAO noted that surveys had been conducted on this matter as a result of APANPIRG Conclusions 21/6, 21/13 and 23/1, so the regional office would conduct a follow up survey. IFATCA noted that the issue of Repetitive Flight Plan (RPL) was also likely to be addressed globally in the next stage of FPL development leading to Flight and Flow Information for a Collaborative Environment (FF-ICE).

The ICAO Asia/Pacific Region FPL Functional Implementation Survey for 2015 is attached. For ease of completion an electronic version (MS Word) may be accessed on the ICAO Asia/Pacific Regional Office website at <http://www.icao.int/APAC/Pages/edocs.aspx>.

States and Administrations are requested to return the completed survey by email to the ICAO Asia and Pacific Regional Office, [apac@icao.int](mailto:apac@icao.int), by 1 June 2015.

The results of the survey will be presented for discussion at the 3<sup>rd</sup> Meeting of the ATM Sub-Group of APANPIRG (ATM/SG/3), to be held in August 2015, and at APANPIRG/26, planned for 7 – 10 September 2015.

## ICAO Asia/Pacific Region Flight Plan (FPL) Functional Implementation Survey 2015

<b>STATE/ADMINISTRATION</b>
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<b>Question 1 – Down Conversion</b>	<b>YES</b>	<b>NO</b>
<i>Is your State currently using a down-conversion process to convert FPL and ATS messages to pre-Amendment 1 format for operational use?</i>		
If YES, go to Question 2. If NO, go to Question 4.		

<b>Question 2 – Down Conversion</b>	<b>YES</b>	<b>NO</b>
<i>Which ATM and related systems require the input of down-converted FPL and ATS messages.</i>		
ATM Automation System/Flight Data Processor (FDP)		
Aeronautical Fixed Telecommunications Network (AFTN)		
Aeronautical Telecommunications Network (ATN)/ATS Message Handling System (AMHS)		
Other (specify)		

<b>Question 3 – Down Conversion</b>
<i>If you answered 'yes' to Question 1, on what date does your State plan to complete the upgrading of all systems to remove reliance on converter solutions?</i>
<b>Date:</b>



<b>Question 4 – Non-PANS-ATM Items</b>		<b>YES</b>	<b>NO</b>
<i>Which of the following items that may be received in FPL are either accepted without processing, accepted and processed for ATC display, or result in rejection?</i>			
Item 9c – Wake Turbulence Category J	Accepted without processing		
	Accepted and processed for ATC display		
	Rejected to operator queue		
	Rejected to originator		
Item 18 – RVR/	Accepted without processing		
	Accepted and processed for ATC display		
	Rejected to operator queue		
	Rejected to originator		
Item 19 – Supplementary FPL	Accepted without processing		
	Rejected to operator queue		
	Rejected to originator		

**Questions 5 to 10** need only be answered by States / Administrations that answered **NO** to **Question 1** 4.

<b>Question 5 – ITEM 10 – Communications, Navigation and Approach Aid Equipment</b>		<b>YES</b>	<b>NO</b>
<i>Does your ATM automation system provide Human Machine Interface (HMI) indication at ATC traffic-separating workstations of the following FPL Item 10 communications, navigation and approach aid indicators?</i>			
A – GBAS landing system			
B – LPV (APV with SBAS)			
G – GNSS			
I – Inertial Navigation			
J1 – J7 (CPDLC)			
R – PBN Approved			
W – RVSM Approved	Indicates RVSM Approved; or		
	Indicates <u>not</u> RVSM Approved		

<b>Question 6 – ITEM 10 – Surveillance Equipment and Capabilities – <u>ATC HMI</u></b> <i>Does your ATM automation system provide Human Machine Interface (HMI) indication at ATC traffic-separating workstations of the following FPL Item 10 surveillance equipment and indicators?</i>	<b>YES</b>	<b>NO</b>
ADS-B (Indicators E, L, B1, or B2)		
SSR Mode S (Indicators E, H, I, L, S) <i>Note: SSR Mode S Indicators P and X are not included in this question as they allow for selective interrogations but do not provide other new information to ATC</i>		
ADS-C (Indicators D1, G1)		

<b>Question 7 –ITEM 10 – Surveillance Equipment and Capabilities <u>Processing</u></b> <i>Does your ATM automation system process and display information received in downlinked aircraft parameters (DAPs) received in Mode S SSR replies and/or ADS-B messages?</i>	<b>YES</b>	<b>NO</b>
Flight Identification		
Aircraft Magnetic Heading		
Indicated Airspeed		
Groundspeed		
Pilot Selected Altitude/Flight Level		
ACAS RA		

<b>Question 8 –ITEM 18 – PBN/ - RNAV and/or RNP capabilities – <u>ATC HMI</u></b> <i>Does your ATM automation system provide Human Machine Interface (HMI) indication at ATC traffic-separating workstations of the following RNAV and/or RNP capability indicators?</i>	<b>YES</b>	<b>NO</b>
A1 (RNAV 10/RNP 10)		
B1 – B6 (RNAV 5)		
C1 – C4 (RNAV 2)		
D1 – D4 (RNAV 1)		
L1 (RNP 4)		
O1 – O4 (RNP 1)		
S1 – S2 (RNP APCH)		
T1 – T2 (RNP AR)		

<b>Question 9 – ITEM 18 – PBN/ - RNAV and/or RNP capabilities - <u>processing</u></b> <i>Does your ATM automation system provide ATC conflict detection, separation, and alerting tools using the following RNAV and/or RNP capability indicators</i>	<b>YES</b>	<b>NO</b>
A1 (RNAV 10/RNP 10)		
B1 – B6 (RNAV 5)		
C1 – C4 (RNAV 2)		
D1 – D4 (RNAV 1)		
L1 (RNP 4)		
O1 – O4 (RNP 1)		

<b>Question 10 – ITEM 18 – DOF/ - Date of Flight</b> <i>How does your State process FPL with EOBT more than 24 hours after submission ?</i>	<b>YES</b>	<b>NO</b>
Processes and retains the FPL in accordance with the DOF and EOBT		
Processes the FPL but disregards the DOF		
Rejects to operator queue		
Rejects to originator		

<b>Question 11 – Additional Information/Comments</b> <i>Please use this section to record any additional relevant information or comments</i>

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ATM/SG/3-WP15

Attachment B

		Australia	Bangladesh	Hong Kong, China	Fiji	Japan	Malaysia	New Zealand	Pakistan	Papua New Guinea	Philippines	Singapore	Sri Lanka	Thailand	U.S.A Continental	Viet Nam Ha Noi	Viet Nam Ho Chi Minh	
<b>Down Conversion</b>	Down-Conversion used	Y		Y										Y			Y	
	FDP			Y										Y			Y	
	AFS																Y	
	Other	Y		Y														
	Cessation Date	Y																
<b>Non-PANS-ATM Items</b>	Wake Turb J - Accept without process		Y		Y					Y				Y				
	Wake Turb J - Accept and process			Y		Y	Y	Y	Y		Y	Y				Y		
	Wake Turb J - Reject to operator queue	Y													Y		Y	
	Wake Turb J - Reject to originator														Y			
	RVR - Accept without process	Y	Y		Y	Y	Y	Y	Y	Y				Y	Y			
	RVR - Accept and Process										Y	Y				Y		
	RVR - Reject to operator queue			Y													Y	
	RVR - Reject to originator																	
	Item 19 - Accept without processing	Y	Y		Y	Y		Y	Y	Y	Y	Y			Y	Y	Y	
	Item 19 - Reject to operator queue			Y			Y								Y			
Item 19 - Reject to originator														Y				
<b>ATC HMI Indications - Comm/NAV/APP Aid equipment</b>	A - GBAS landing system										Y	Y		Y				
	B - LPV (APV with SBAS)										Y	Y						
	G - GNSS	Y									Y	Y			Y		Y	
	I - Inertial navigation	Y									Y	Y			Y		Y	
	J1 - J7 CPDLC	Y					Y				Y	Y			Y			
	R - PBN approved	Y					Y	Y			Y	Y			Y		Y	
	W - RVSM approved						Y	Y	Y		Y	Y				Y	Y	
	W - RVSM approved	Y					Y	Y	Y		Y				Y	Y		

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Attachment B

<b>ATC HMI Indications - Surveillance</b>	ADS-B Indicators E, L, B1 or B2	Y			Y	Y	Y
	SSR Mode S Indicators E, H, I, L or S)				Y	Y	
	ADS-C Indicators D1, G1	Y			Y	Y	Y
<b>ATM Processing and Display Downlinked Aircraft Parameters</b>	Flight Identification	Y	Y	Y	Y		Y
	Aircraft magnetic heading		Y	Y	Y		Y
	Aircraft indicated airspeed		Y	Y	Y		
	aircraft groundspeed		Y	Y	Y		Y
	pilot selcted altitude/flight level		Y	Y	Y		Y
	ACAS RA				Y		
<b>ATC HMI Indications - RNAV and/or RNP Capabilities</b>	A1 - RNAV10/RNP10	Y		Y	Y	Y	Y
	B1-B6 - RNAV 5	Y			Y	Y	Y
	C1-C4 - RNAV 2				Y	Y	Y
	D1-D4 - RNAV 1				Y	Y	Y
	L1 - RNP 4	Y		Y	Y	Y	Y
	O1-04 - RNP 1				Y	Y	
	S1-S2 - RNP APCH	Y			Y	Y	
	T1-T2 - RNP AR	Y			Y	Y	
<b>ATC conflict detection, separation and alerting tools</b>	A1 - RNAV10/RNP10	Y		Y	Y		Y
	B1-B6 - RNAV 5	Y					
	C1-C4 - RNAV 2						
	D1-D4 - RNAV 1						
	L1 - RNP 4	Y		Y			Y
	O1-04 - RNP 1						
Processing EOBT more than 24 hours after FPL submission	Processes and retains FPL	Y	Y	Y	Y	Y	Y
	Process the FPL but diregards DOF				Y		
	Rejects to operator queue		Y				Y
	Rejects to originator						Y

**Summary of Survey Responses**

<b>Down Conversion</b>	<b>Administrations</b>
Down Conversion Used (Total Administrations)	4
FDP	3
AFS	1
Other	2
End date provided	1

<b>Non-PANS-ATM Items</b>	<b>Administrations</b>
Wake Turbulence Category J – accepted without processing	4
Wake Turbulence Category J – accepted and processed	7
Wake Turbulence Category J – rejected to operator queue	3
Wake Turbulence Category J – rejected to originator	1
RVR – accepted without processing	10
RVR – accepted and processed	2
RVR – rejected to operator queue	2
RVR – rejected to originator	-
FPL Item 19 – accepted without processing	11
FPL Item 19 – rejected to operator queue	3
FPL Item 19 – rejected to originator	1

<b>ATC HMI Indications – COM/NAV/APP Aids</b>	<b>Administrations</b>
A – GBAS landing system	3
B – LPV (APV with SBAS)	2
G – GNSS	5
I – Inertial navigation	5
J1 - J7 CPDLC	5
R – PBN approved	7
W – RVSM approved	6
W – not RVSM approved	6

<b>ATC HMI Indications - Surveillance</b>	<b>Administrations</b>
ADS-B indicators E, L, B1 or B2	4
SSR Mode S indicators E, H, I, L or S	2
ADS-C indicators D1, G1	4

<b>ATM Processing and Display - DAPs</b>	<b>Administrations</b>
Flight Identification	4
Aircraft magnetic heading	3
Aircraft indicated airspeed	3
Pilot selected altitude	3
ACAS RA	2

<b>ATC HMI Indications – RNAV/RNP Capabilities</b>	<b>Administrations</b>
A1 – RNAV10/RNP10	5
B1-B6 – RNAV 5	4
C1-C4 – RNAV 2	3
D1-D4 – RNAV 1	3
L1 – RNP 4	5
O1-O4 – RNP 1	2
S1-S2 – RNP APCH	3
T1-T2 – RNP AR	3

<b>ATC Conflict Detection, Separation and Alerting Tools</b>	<b>Administrations</b>
A1 – RNAV10/RNP10	4
B1-B6 – RNAV 5	1
C1-C4 – RNAV 2	-
D1-D4 – RNAV 1	-
L1 – RNP 4	3
O1-O4 – RNP 1	-

<b>Processing EOBT more than 24 Hours after FPL Submission</b>	<b>Administrations</b>
Processes and Retains FPL	6
Processes the FPL but disregards DOF	1
Rejects to operator queue	2
Rejects to originator	1