

# *Extended Diversion Time Operations Workshop*



Alternate

Destination

ETP1

ETP2

Departure

## **Module 5** *Practical Exercise*



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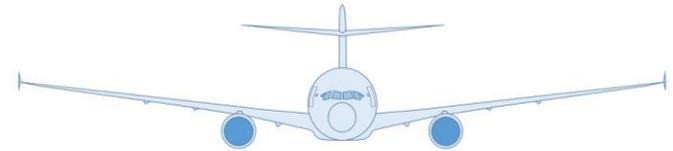
## Background:



### Your team is part of the Flight Dispatch organization of EDTO Airways

- EDTO Airways is an experienced EDTO airline, operating multiple EDTO fleets on various EDTO routes worldwide.
- For this exercise you will be focusing on the WP-911 operations at EDTO Airways, and in particular the EDTO route from Christchurch, New Zealand to Tucson, Arizona:
  - **Figure 1:** WP-911 Aeroplane Technical Characteristics
  - **Figure 2:** WP-911 Aeroplane Flight Manual EDTO Supplement
  - **Figure 3:** EDTO Airways WP-911 Operations Specification
  - **Figure 4:** CHC-TUS Route Summary and Approved Enroute Alternate Aerodromes

**Figure 1: WP-911 Aeroplane Information**



WonderPlanes®  
WP-911

Greenpush RG3350-89

MTOW	MLW	MZFW	OEW	Max Payload	Fuel Capacity
242,000 kg	190,000 kg	175,000 kg	120,000 kg	55,000 kg	125,000 L

Length	Wing Span	Tail Height	Tail Span	Pax Capacity	Cargo Volume
62.8 m	60.1 m	17.0 m	19.8 m	290 (30J / 260Y)	165.0 m <sup>3</sup>

RFFS	ACN	Landing Field Length (MLW)
9	62	2,620 m

## Figure 2: WP-911 Aeroplane Flight Manual EDTO Supplement

WP-911 Aeroplane Flight Manual EDTO Supplement

**WonderPlanes®** 

**WP-911**  
**Aeroplane Flight Manual**

**Appendix E-01, Revision 0**

**Extended Diversion Time Operations (EDTO) 300 Minutes**

Note: Refer to appendix effectivity page in the basic AEM document to determine ASN applicability for this Appendix.

<p><b>WonderPlanes®</b> WP-911 AEROPLANE FLIGHT MANUAL</p>	<p><b>APPENDICES AND SUPPLEMENTS</b>  <b>EXTENDED DIVERSION TIME OPERATIONS (EDTO)</b></p>
<p><b>GENERAL</b></p>	
<p>This supplement is applicable to Extended Diversion Time Operations (ETOPS/EDTO), which applies to operations of turbine powered aeroplanes beyond the applicable threshold specified by the national authority.</p> <p>The type design reliability and performance of this aeroplane-engine combination has been evaluated and found to comply with the applicable criteria for operations above 60 minutes diversion time (including ETOPS/EDTO beyond 180 minutes) when the Configuration, Maintenance and Procedures standards contained in the approved WonderPlanes CMP document reference WP911-CMP-001 at the latest applicable revision are met.</p> <p>Actual diversion time for this aeroplane can not exceed the time-limited systems capability identified in the LIMITATIONS in accordance with the criteria given in the applicable EDTO operational regulations.</p> <p>This supplement does not constitute an operational approval to conduct EDTO. Such approval must be obtained by the operator from the appropriate national authority.</p>	
<p><b>LIMITATIONS</b></p>	
<p><b>The time capability of the cargo fire suppression system is 270 minutes</b></p> <p><b>The time capability of all other EDTO significant systems is 315 minutes</b></p> <p><b>The maximum diversion distance is 2000 nm</b></p>	

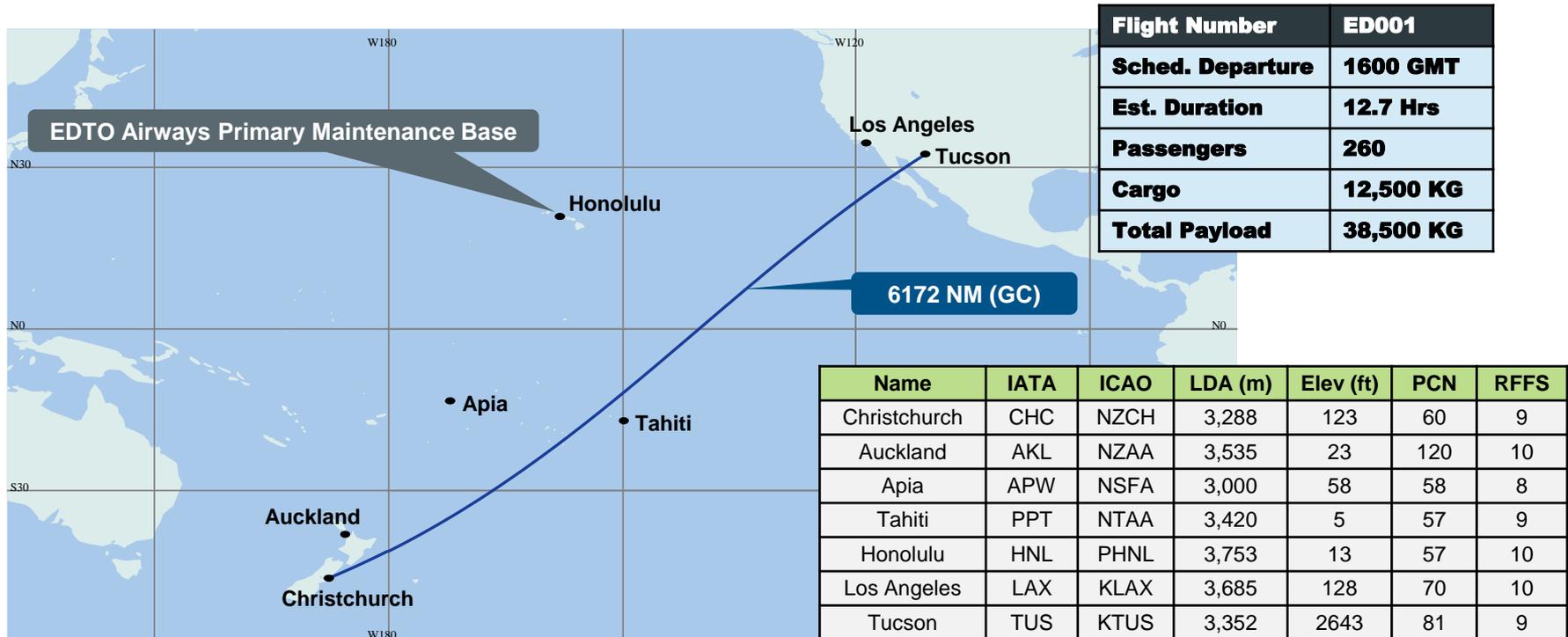


**Figure 3: WP-911 Operations Specification for EDTO Airways**

<b>OPERATIONS SPECIFICATIONS</b> (subject to the approved conditions in the operations manual)	
<b>ISSUING AUTHORITY CONTACT DETAILS<sup>1</sup></b>	
Telephone: <b>+00-11-2222</b>	Fax: <b>+00-22-1111</b> E-mail: <b>xxx@caa.gov</b>
AOC# <sup>2</sup> : <b>000-111</b> Operator name <sup>3</sup> : <b>EDTO Airways</b> Date <sup>4</sup> : _____ Signature: _____	
Dba trading name: _____	
Aircraft model <sup>6</sup> : <b>WonderPlanes WP-911</b>	
Types of operation: Commercial air transportation <input checked="" type="checkbox"/> Passengers <input type="checkbox"/> Cargo <input type="checkbox"/> Other <sup>5</sup> : _____	
Area(s) of operation <sup>7</sup> : <b>Worldwide</b>	
Special limitations <sup>8</sup> : _____	

SPECIAL AUTHORIZATIONS	YES	NO	SPECIFIC APPROVALS <sup>9</sup>	REMARKS
Dangerous goods	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
Low visibility operations				
Approach and landing	<input checked="" type="checkbox"/>	<input type="checkbox"/>	CAT <sup>10</sup> : _____ RVR: _____ m DH: _____ ft	
Take-off	<input checked="" type="checkbox"/>	<input type="checkbox"/>	RVR <sup>11</sup> : _____ m	
RVSM <sup>12</sup> <input type="checkbox"/> N/A	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
EDTO <sup>13</sup> <input type="checkbox"/> N/A	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Threshold time <sup>14</sup> : <b>60</b> minutes  Maximum diversion time <sup>14</sup> : <b>240</b> minutes	240 minute authorization is only for Pacific area.  Authorization is limited to 180 minutes for other areas.
Navigation specifications for PBN operations <sup>15</sup>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		<sup>16</sup>
Continuing airworthiness	<input type="checkbox"/>	<input type="checkbox"/>	<sup>17</sup>	
Other <sup>18</sup>	<input type="checkbox"/>	<input type="checkbox"/>		

**Figure 4: CHC-TUS, Route Summary and Enroute Alternate Aerodromes**



## Operational Considerations (see Figure 5):

### WP-911 Flight ED001 is about to be dispatched from CHC to TUS

- The aeroplane is configured for 300 minute EDTO capability, and the EDTO status of the aeroplane has been confirmed by maintenance.

EDTO Status as shown on Tech Log:

	Diversion Time (minutes)		
EDTO Status	<input checked="" type="checkbox"/> 300	<input type="checkbox"/> 180	<input type="checkbox"/> 60
	Verification flight required (Y/N):		N

- The weather and field conditions at the EDTO alternate aerodromess have been found to be satisfactory. APW and HNL weather are deteriorating, but still meet EDTO requirements.
- There are two typhoons (named Eric and Mike) in the area between Hawaii and Tahiti, however neither is located directly on the Great Circle route track.
- Tahiti reports that one of their fire trucks is unserviceable, and the aerodrome is temporarily downgraded to RFFS Category 7 (Note: the WP-911 is a Category 9 aeroplane).

**Figure 5: CHC-TUS, Weather and Operational Conditions**



### Enroute Weather:

- Two typhoons (Eric and Mike) between PPT and HNL. Eric stationary, Mike tracking Northwest. Moderate icing around typhoons.
- High Pressure area in South Pacific, Low Pressure area between Hawaii and Japan

### Aerodrome Conditions:

- All aerodromes forecast above EDTO dispatch minimums with acceptable field conditions.
- Weather deteriorating in APW and HNL, but still acceptable during required validity period.
- PPT NOTAM shows 1 fire truck unserviceable and downgrade to RFFS 7 (the WP-911 is an RFFS 9 aeroplane).

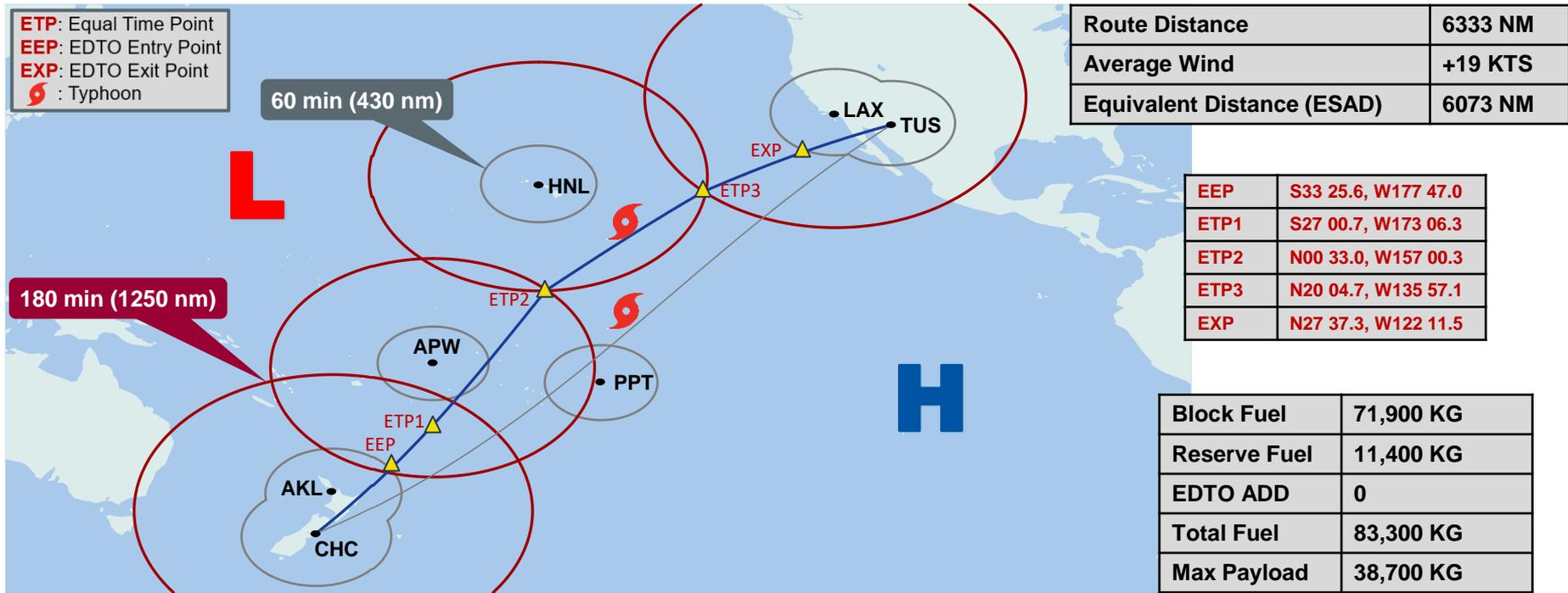
*Note: HNL is EDTO Airways main maintenance base in the region and the next planned destination after flight ED001*

## Potential Routing Solutions:

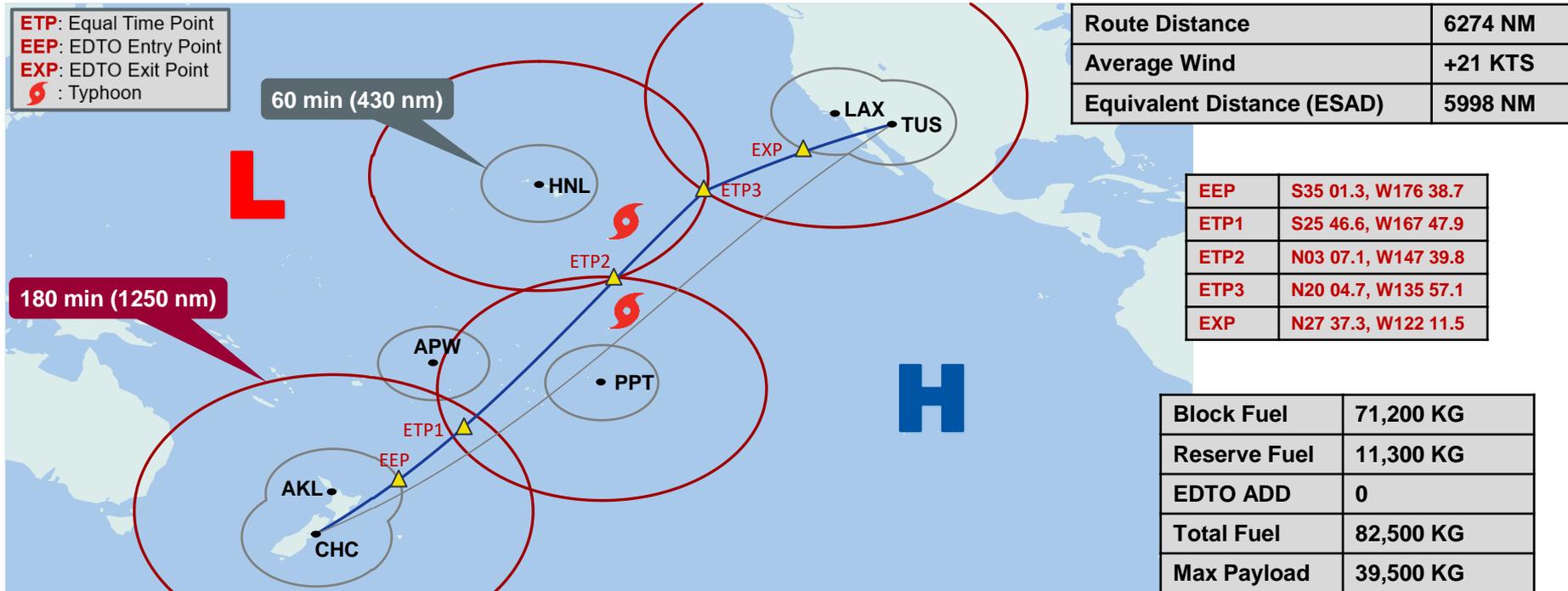
Three potential routing solutions have been prepared by your organization for flight ED001, based on the following EDTO maximum diversion times and selected EDTO alternate aerodromes:

- **Option 1:** 180 Minute EDTO route using AKL, APW, HNL and LAX (see Figure 6)
- **Option 2:** 180 Minute EDTO route using AKL, PPT, HNL and LAX (see Figure 7)
- **Option 3:** 240 Minute EDTO route using AKL, PPT, HNL and LAX (see Figure 8)

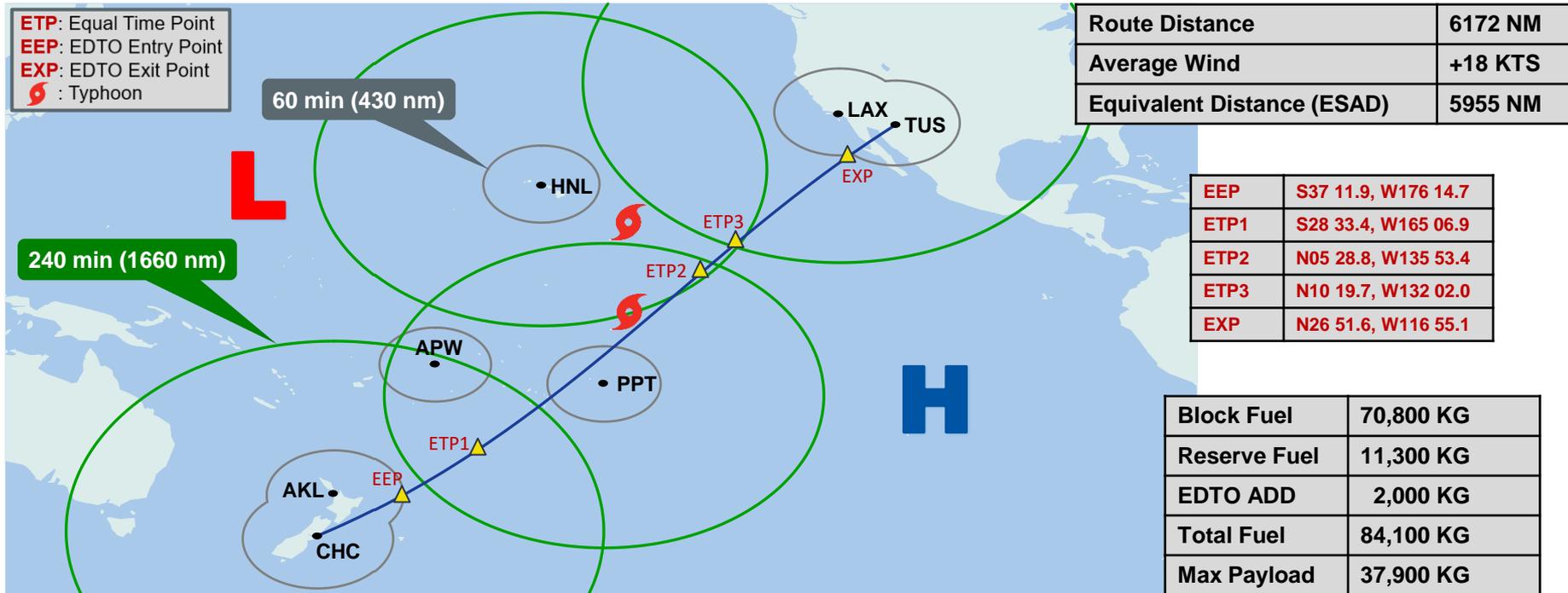
**Figure 6: CHC-TUS Route Option 1, 180 Minutes (AKL, APW, HNL, LAX)**



**Figure 7: CHC-TUS Route Option 2, 180 Minutes (AKL, PPT, HNL, LAX)**



**Figure 8: CHC-TUS Route Option 3, 240 Minutes (AKL, PPT, HNL, LAX)**



## Operating Regulations (see Figure 9):

The three potential routing solutions have been developed in compliance with the following EDTO Airways State Operating Regulations:

- **CAR 121.001:** EDTO Fuel Supply
- **CAR 121.002:** EDTO Alternate Aerodromes
- **CAR 121.003:** Considering Time Limited Systems in Planning EDTO Alternates
- **CAR 121.004:** EDTO Alternate Aerodrome: Rescue and Firefighting Service (RFFS)

## Assignment:

**Your team is preparing a briefing for the flight crew who has also reviewed the potential routes, weather and operational conditions for this flight. You will need to make some decisions and be prepared to answer questions from the Captain.**

- Review the information provided in Figures 1 through 9 for background.
  - EDTO Airways operational EDTO capability and WP-911 EDTO configuration status
  - Weather and aerodrome conditions as relates to preferred route selection
  - Routing options and related performance differences (tracks, winds, fuel...)
  - Operating regulations, with attention to differences between 180 and 240 minute EDTO
- Choose one of the three flight plan options based on your team's review of the information provided. Be prepared to justify your team's decision and explain your thought process.

## Assignment (cont'd):

**Designate at least one spokesperson to conduct the flight briefing. Discuss as a team how to answer the following potential questions from the Captain:**

1. “I have reviewed three possible EDTO tracks for this flight, which track was selected for the flight release and why?” Is this a legal flight plan solution?”
2. “Explain the requirements for EDTO time limited systems for both the 180 and 240 minute EDTO tracks. Which diversion scenarios were considered, and are there any limitations to be aware of?”
3. “Explain the requirements for EDTO critical fuel for both the 180 and 240 minute EDTO tracks, including the assumed diversion scenarios and atmospheric conditions. Are there any EDTO fuel limitations on this flight?”

## Assignment (cont'd):

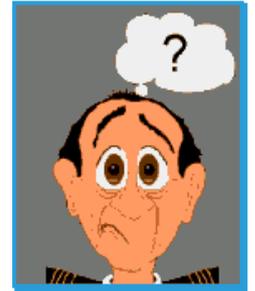
### More potential questions from the Captain...!

4. “I have reviewed the NOTAMs for the potential EDTO alternates and noted that PPT RFFS capability has been downgraded. Is this going to be a problem?”
5. “I also noticed that the terminal forecasts are showing degrading ceilings in APW and HNL. What if the weather goes below the EDTO dispatch minimums while we are enroute?”
6. “In any case I think we will divert to HNL if we have any problems as long as we are legal to shoot an approach. Do you agree this is the best course of action?”
7. “I’m a bit concerned about these typhoons though, are there any potential diversion scenarios which have not been considered in the flight plan that I should be aware of?”

## Team Breakouts (~45 Minutes)

**Please split up into your individual teams to begin the exercise. You will have ~45 minutes to review the information, choose a flight plan, prepare for the flight briefing Q&A and select a team spokesperson(s).**

**We will conduct a role playing session with each team following the breakouts. Your team spokesperson(s) will play the role of the Flight Dispatch Officer, who will be meeting with Captain Ian, Eric or Mike for the flight briefing.**



## **Role Playing Sessions (~10 to 15 Minutes Each Team)**

## Conclusions, Solutions... and food for thought

### Responses to questions from the Captain:

1. *“I have reviewed three possible EDTO tracks for this flight, which track was selected for the flight release and why? Is this a legal flight plan solution?”*



Either of the three potential EDTO routings represent valid EDTO dispatch solutions and could have been selected for this exercise. In other words, there was no wrong answer to this question!

The 240 minute option did have the advantage of reducing potential exposure to adverse enroute weather conditions. This option also involved longer planned diversion times, an EDTO fuel adjustment, reduced payload capability and the need to consider the additional route planning requirements associated with beyond 180 minute EDTO.



## Conclusions, Solutions... and food for thought (cont'd)

2. *“Explain the requirements for EDTO time limited systems for both the 180 and 240 minute EDTO tracks. Which diversion scenarios were considered, and are there any limitations to be aware of?”*

The check of the Time Limited Systems depends on the applicable maximum diversion time (MDT) planned at dispatch (CAR 121.003).

- For EDTO up to 180 minutes: Check that maximum DT + 15 minutes (engine inoperative, still air) along the planned route does not exceed the aeroplanes EDTO time limited system capability.
- For EDTO beyond 180 minutes: Check that maximum DT + 15 minutes (all engine and engine inoperative) along the planned route, considering forecast winds and temperatures, does not exceed the relevant aeroplane EDTO time limited system capability.

## Conclusions, Solutions... and food for thought (cont'd)

3. *“Explain the requirements for EDTO critical fuel for both the 180 and 240 minute EDTO tracks, including the assumed diversion scenarios and atmospheric conditions. Are there any EDTO fuel limitations on this flight?”*

The EDTO critical fuel check (CAR 121.001) must always account for forecast weather conditions including winds and potential forecast icing conditions for the three diversion scenarios (decompression, engine failure and decompression + engine failure), this includes the diversion fuel planning to HNL where the typhoons may be a factor. There was no critical fuel adjustment for either of the 180 minute flight plans, however the 240 minute plan had an adjustment of 2000 kg to account for the increased diversion distance from ETP3. This critical fuel adjustment also resulted in a reduced maximum payload capability 600 kg below the nominal planned payload for the flight.

## Conclusions, Solutions... and food for thought (cont'd)

4. *“I have reviewed the NOTAMs for the potential EDTO alternates and noted that PPT RFFS capability has been downgraded. Is this going to be a problem?”*

The PPT RFFS downgrade to Category 7 has no bearing on planning PPT as a either a 180 minute or 240 minute EDTO alternate. As per CAR 121.004, RFFS Category 4 is the minimum requirement for an EDTO alternate aerodrome. For EDTO beyond 180 minutes, there is an additional requirement for Category 7 Adequate Aerodromes within the dispatch maximum diversion time which is also satisfied by PPT even with the RFFS downgrade.

## Conclusions, Solutions... and food for thought (cont'd)

5. *“I also noticed that the terminal forecasts are showing degrading ceilings in APW and HNL. What if the weather goes below the EDTO dispatch minimums while we are enroute?”*

Deteriorating weather conditions at APW and HNL should not be an issue unless either of these aerodromes should fall below normal operating minimums before the flight passes the EDTO Entry Point (EEP). In this case a new EDTO area solution would need to be established (if possible) to continue the EDTO flight. EDTO dispatch planning minimums do not apply anymore once the flight is enroute. Once the flight has progressed past the EEP and committed to EDTO airspace, there are no specific EDTO alternate weather requirements for continued flight to destination.

## Conclusions, Solutions... and food for thought (cont'd)

6. *“In any case I think we will divert to HNL if we have any problems as long as we are legal to shoot an approach. Do you agree this is the best course of action?”*

The Captain appears to be a bit misguided with the idea of only planning to divert to HNL (presumably as a convenient maintenance base). HNL should only be considered as the primary diversion alternate for this flight during the portion of the route between ETP2 and ETP3. Also, the likelihood of adverse weather along potential diversion tracks needs to be considered. Enroute EDTO diversion decision making is at the discretion of the flight crew, however the focus should be on safety not operational convenience.

## Conclusions, Solutions... and food for thought (cont'd)

7. *“I’m a bit concerned about these typhoons though, are there any potential diversion scenarios which have not been considered in the flight plan that I should be aware of?”*

Diverting into typhoon conditions is a valid concern, this is one of the benefits of the 240 minute flight plan solution which minimizes the flight segment length where HNL is the primary diversion alternate. Regarding potential diversion scenarios which have not been considered, note that the TLS and CFR flight plan calculations can be somewhat simplified in assuming a ‘direct to’ diversion from each ETP which may not be operationally feasible in certain cases (e.g. weather avoidance, terrain..). For these cases, a manual adjustment to the flight plan routing and/or fuel load may be appropriate to ensure that the flight is protected in the event of an indirect or ‘dog leg’ track to the diversion aerodrome.

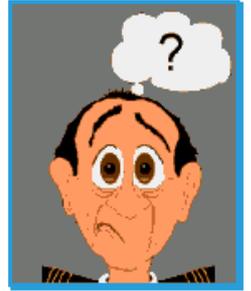
**Any other comments or observations to share from this exercise?**



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# End of Module 5 - Practical Exercise



**Thank You and Well Done!!**