

CAO 48.1 (Complex Operations) Quick Reference Guide

Version 1.1



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Acclimatisation State

Displacement = TZ offset at Destination – TZ offset at point of last acclimatisation.

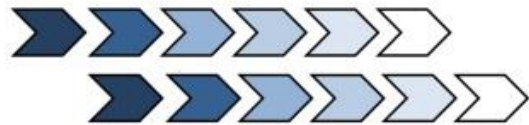
- If the calculated ***Displacement*** is less than -12, ***add 24.***

A positive value will be an East displacement while a negative value will be a West displacement.

Time zone change (measured in time zones)	Adaptation period to become acclimatised to new location (hours)	
	West	East
Note See definition of time zone		
2	24	30
3	36	45
4	48	60
5	48	60
6	48	60
7	72	90
8	72	90
9	72	90
10 or more	96	120

The Required Adaptation Period that is:

- Away from Base,
 - may be reduced by 12 hours for each previous off-duty period that:
 - immediately preceded the adaptation period; and
 - was taken at an off-duty location which differs in local time by less than 2 hours from the adaptation location; and
 - included an off-duty location local night.



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Scheduled Daily Flight Time / FDP Limits

Crew Member is in an Acclimated State

Acclimatised time at start of FDP	Maximum FDP												Maximum Flight time in FDP											
	2 Pilots						3 Pilots			4 Pilots			2 Pilots						3 Pilots			4 Pilots		
	According to sectors to be flown						According to In-flight rest facility						According to sectors to be flown						According to In-flight rest facility					
	1-2	3	4	5	6	7+	Class 1	Class 2	Class 3	Class 1	Class 2	Class 3	1-2	3	4	5	6	7+	Class 1	Class 2	Class 3	Class 1	Class 2	Class 3
0000 – 0459	10:00	9:00	9:00	8:00	8:00	8:00	14:00	12:30	11:00	15:00	13:30	11:30	8:00	8:00	8:00	7:00	7:00	7:00	12:00	10:30	9:00	13:00	11:30	9:30
0500 – 0559	11:00	10:00	10:00	9:00	9:00	9:00	14:00	12:30	11:00	15:00	13:30	11:30	9:00	8:00	8:00	8:00	8:00	8:00	12:00	10:30	9:00	13:00	11:30	9:30
0600 – 0659	12:00	11:00	11:00	10:00	10:00	9:00	15:30	14:30	13:30	17:30	16:00	14:00	9:00	9:00	9:00	8:00	8:00	8:00	13:30	12:30	11:30	15:30	14:00	12:00
0700 – 0759	13:00	12:00	12:00	11:00	11:00	10:00	15:30	14:30	13:30	17:30	16:00	14:00	9:30	9:00	9:00	9:00	9:00	8:00	13:30	12:30	11:30	15:30	14:00	12:00
0800 – 1059	14:00	13:00	13:00	12:00	11:00	11:00	16:00	15:30	15:00	18:00	17:00	15:30	10:00	9:30	9:30	9:00	9:00	9:00	14:00	13:30	13:00	16:00	15:00	13:30
1100 – 1359	13:00	12:00	12:00	11:00	11:00	10:00	15:30	15:00	13:30	17:30	16:00	14:00	9:30	9:00	9:00	9:00	9:00	8:00	13:30	13:00	11:30	15:30	14:00	12:00
1400 – 1459	12:00	11:00	11:00	10:00	10:00	9:00	15:00	13:30	12:00	16:30	15:00	13:00	9:00	9:00	9:00	8:00	8:00	8:00	13:00	11:30	10:00	14:30	13:00	11:00
1500 – 1559	11:00	10:00	10:00	10:00	9:00	9:00	15:00	13:30	12:00	16:30	15:00	13:00	9:00	8:00	8:00	8:00	8:00	8:00	13:00	11:30	10:00	14:30	13:00	11:00
1600 – 2359	10:00	9:00	9:00	9:00	8:00	8:00	14:00	12:30	11:00	15:00	13:30	11:30	9:00	8:00	8:00	8:00	7:00	7:00	12:00	10:30	9:00	13:00	11:30	9:30

Crew Member is in an Unknown State of Acclimatisation

Duration of off-duty period immediately before the FDP	Maximum FDP												Maximum Flight time in FDP											
	2 Pilots						3 Pilots			4 Pilots			2 Pilots						3 Pilots			4 Pilots		
	According to sectors to be flown						According to In-flight rest facility						According to sectors to be flown						According to In-flight rest facility					
	1-2	3	4	5	6	7+	Class 1	Class 2	Class 3	Class 1	Class 2	Class 3	1-2	3	4	5	6	7+	Class 1	Class 2	Class 3	Class 1	Class 2	Class 3
Less than 30 hours	11:00	10:00	10:00	9:00	9:00	9:00	14:00	12:30	11:00	15:00	13:30	11:30	9:00	8:00	8:00	8:00	8:00	8:00	12:00	10:30	9:00	13:00	11:30	9:30
30 hours or more	12:00	11:00	11:00	10:00	10:00	9:00	15:00	13:30	12:00	16:30	15:00	13:00	9:00	9:00	9:00	8:00	8:00	8:00	13:00	11:30	10:00	14:30	13:00	11:00

Use FDP Start Time, Number of Pilots, Number of scheduled Sectors and Class of In-Flight Rest Facility



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Scheduled Daily Flight Time / FDP Limits

Additional Limitations for Augmented Flight Crews

<= 14:00 FDP	> 14:00 FDP and <= 16:00	> 16:00 FDP
<ul style="list-style-type: none"> • Max 3 sectors • Minimum 1:30 inflight rest for any FCM • Minimum 2:00 inflight rest for FCM landing on last sector 	<ul style="list-style-type: none"> • Max 2 sectors • Minimum 1:30 inflight rest for any FCM • Minimum 2:00 inflight rest for FCM landing on last sector • Last sector must be >= 9:00 	<ul style="list-style-type: none"> • Max 1 sectors • Minimum 2:00 inflight rest for any FCM • Minimum 3:00 inflight rest for FCM landing on last sector

Split Duty Extension

May not be used with **Inflight Rest Extension**.

Is a FDP which contains a Break of at least **4:00** in a ground rest facility.

Break is less than a Required ODP.

For an FDP that **does not touch** any portion of the time from **23:00 to 05:29**:

- Permits extensions above the scheduled FDP limits by **4:00** but no more than **16:00** total FDP
- The first **4:00** of the break reduces the applied duty time by **2:00** for the determination of the next ODP

For an FDP that **does touch** any portion of the time from **23:00 to 05:29**:

- Permits extensions above the scheduled FDP limits by **2:00** but no more than **16:00** total FDP.

The Portion of the FDP after the Break may not exceed **6:00**.



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Cumulative Duty Time / Flight Time Limitations

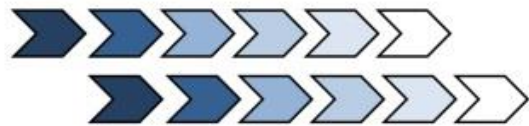
Cumulative Duty Limits		Cumulative Flight Time Limits	
Hours	Time Period (Rolling)	Hours	Time Period (Rolling)
60	168:00	100	28 Calendar Days
100	336:00	1000	365 Calendar Days

Late Night FDP (LNFDP)

Time from start of previous LNFDP to the current LNFDP must be at least **24:00**.

A FCM assigned to 3 LNFDP in any 168 hr consecutive span, then the FCM may not be assigned more the 4 FDP's or Standby duties within the same period.

Completed number of FDPs in 168 hour period		Allowable FDP under LNOs Limits	
Number of LNFDPs	Total FDPs— including LNFDPs	Is a further FDP allowed in 168 hour period?	Can next FDP be a LNFDP?
1	1 or More	Yes	Yes
2	2 or 3	Yes	Yes
2	4 or more	Yes	No
3	3	Yes	Yes
3	4	No	N/A
4	4	No	N/A



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Extension Due to Unforeseen Circumstances

Crew Member is in an Acclimated State

Acclimatised time at start of FDP	Maximum Extended FDP												Maximum Extended Flight time in FDP											
	2 Pilots						3 Pilots			4 Pilots			2 Pilots						3 Pilots			4 Pilots		
	According to sectors to be flown						According to In-flight rest facility						According to sectors to be flown						According to In-flight rest facility					
	1-2	3	4	5	6	7+	Class 1	Class 2	Class 3	Class 1	Class 2	Class 3	1-2	3	4	5	6	7+	Class 1	Class 2	Class 3	Class 1	Class 2	Class 3
0000 – 0459	11:00	10:00	10:00	9:00	9:00	9:00	16:00	14:30	13:00	17:00	15:30	13:30	8:30	8:30	8:30	7:30	7:30	7:30	13:00	11:30	10:00	14:00	12:30	10:30
0500 – 0559	12:00	11:00	11:00	10:00	10:00	10:00	16:00	14:30	13:00	17:00	15:30	13:30	9:30	8:30	8:30	8:30	8:30	8:30	13:00	11:30	10:00	14:00	12:30	10:30
0600 – 0659	13:00	12:00	12:00	11:00	11:00	10:00	17:30	16:30	15:30	19:30	18:00	16:00	9:30	9:30	9:30	8:30	8:30	8:30	14:30	13:30	12:30	16:30	15:00	13:00
0700 – 0759	14:00	13:00	13:00	12:00	12:00	11:00	17:30	16:30	15:30	19:30	18:00	16:00	10:00	9:30	9:30	9:30	9:30	8:30	14:30	13:30	12:30	16:30	15:00	13:00
0800 – 1059	15:00	14:00	14:00	13:00	12:00	12:00	18:00	17:30	17:00	20:00	19:00	17:30	10:30	10:00	10:00	9:30	9:30	9:30	15:00	14:30	14:00	17:00	16:00	14:30
1100 – 1359	14:00	13:00	13:00	12:00	12:00	11:00	17:30	17:00	15:30	19:30	18:00	16:00	10:00	9:30	9:30	9:30	9:30	8:30	14:30	14:00	12:30	16:30	15:00	13:00
1400 – 1459	13:00	12:00	12:00	11:00	11:00	10:00	17:00	15:30	14:00	18:30	17:00	15:00	9:30	9:30	9:30	8:30	8:30	8:30	14:00	12:30	11:00	15:30	14:00	12:00
1500 – 1559	12:00	11:00	11:00	11:00	10:00	10:00	17:00	15:30	14:00	18:30	17:00	15:00	9:30	8:30	8:30	8:30	8:30	8:30	14:00	12:30	11:00	15:30	14:00	12:00
1600 – 2359	11:00	10:00	10:00	10:00	9:00	9:00	16:00	14:30	13:00	17:00	15:30	13:30	9:30	8:30	8:30	8:30	7:30	7:30	13:00	11:30	10:00	14:00	12:30	10:30

Crew Member is in an Unknown State of Acclimatisation

Duration of off-duty period immediately before the FDP	Maximum Extended FDP												Maximum Extended Flight time in FDP											
	2 Pilots						3 Pilots			4 Pilots			2 Pilots						3 Pilots			4 Pilots		
	According to sectors to be flown						According to In-flight rest facility						According to sectors to be flown						According to In-flight rest facility					
	1-2	3	4	5	6	7+	Class 1	Class 2	Class 3	Class 1	Class 2	Class 3	1-2	3	4	5	6	7+	Class 1	Class 2	Class 3	Class 1	Class 2	Class 3
Less than 30 hours	12:00	11:00	11:00	10:00	10:00	10:00	16:00	14:30	13:00	17:00	15:30	13:30	9:30	8:30	8:30	8:30	8:30	8:30	13:00	11:30	10:00	14:00	12:30	10:30
30 hours or more	13:00	12:00	12:00	11:00	11:00	10:00	17:00	15:30	14:00	18:30	17:00	15:00	9:30	9:30	9:30	8:30	8:30	8:30	14:00	12:30	11:00	15:30	14:00	12:00

Extensions Before Takeoff

- The re-computed cumulative Flight Times in 28 days and 365 days will not exceed the respective limits 100 hours / 1000 hours.
- The re-computed cumulative Duty Times in 168 hours and 336 hours will not exceed the respective limits 60 hours / 100 hours.
- Each FCM, considers himself or herself fit for the extension.
- Extension permits an increase by 1 segment.

Extensions After Takeoff

- The flight may continue to the planned destination or alternate at the discretion of the pilot in command.



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Rescheduled FDP

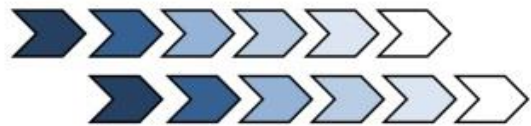
- The modified FDP must not be more than 4 hours longer than the assigned FDP.
- The re-computed cumulative Flight Times in 28 days and 365 days will not exceed the respective limits 100 hours / 1000 hours.
- The re-computed cumulative Duty Times in 168 hours and 336 hours will not exceed the respective limits 60 hours / 100 hours.
- Each FCM, must consider himself or herself fit for the modified FDP.
- The FCM may not exceed the scheduled FDP limits in accordance with the tables below.

Crew Member is in an Acclimated State

Acclimatised time at start of FDP	Maximum FDP												Maximum Flight time in FDP											
	2 Pilots						3 Pilots			4 Pilots			2 Pilots						3 Pilots			4 Pilots		
	According to sectors to be flown						According to In-flight rest facility						According to sectors to be flown						According to In-flight rest facility					
	1-2	3	4	5	6	7+	Class 1	Class 2	Class 3	Class 1	Class 2	Class 3	1-2	3	4	5	6	7+	Class 1	Class 2	Class 3	Class 1	Class 2	Class 3
0000 – 0459	10:00	9:00	9:00	8:00	8:00	8:00	14:00	12:30	11:00	15:00	13:30	11:30	8:00	8:00	8:00	7:00	7:00	7:00	12:00	10:30	9:00	13:00	11:30	9:30
0500 – 0559	11:00	10:00	10:00	9:00	9:00	9:00	14:00	12:30	11:00	15:00	13:30	11:30	9:00	8:00	8:00	8:00	8:00	8:00	12:00	10:30	9:00	13:00	11:30	9:30
0600 – 0659	12:00	11:00	11:00	10:00	10:00	9:00	15:30	14:30	13:30	17:30	16:00	14:00	9:00	9:00	9:00	8:00	8:00	8:00	13:30	12:30	11:30	15:30	14:00	12:00
0700 – 0759	13:00	12:00	12:00	11:00	11:00	10:00	15:30	14:30	13:30	17:30	16:00	14:00	9:30	9:00	9:00	9:00	9:00	8:00	13:30	12:30	11:30	15:30	14:00	12:00
0800 – 1059	14:00	13:00	13:00	12:00	11:00	11:00	16:00	15:30	15:00	18:00	17:00	15:30	10:00	9:30	9:30	9:00	9:00	9:00	14:00	13:30	13:00	16:00	15:00	13:30
1100 – 1359	13:00	12:00	12:00	11:00	11:00	10:00	15:30	15:00	13:30	17:30	16:00	14:00	9:30	9:00	9:00	9:00	9:00	8:00	13:30	13:00	11:30	15:30	14:00	12:00
1400 – 1459	12:00	11:00	11:00	10:00	10:00	9:00	15:00	13:30	12:00	16:30	15:00	13:00	9:00	9:00	9:00	8:00	8:00	8:00	13:00	11:30	10:00	14:30	13:00	11:00
1500 – 1559	11:00	10:00	10:00	10:00	9:00	9:00	15:00	13:30	12:00	16:30	15:00	13:00	9:00	8:00	8:00	8:00	8:00	8:00	13:00	11:30	10:00	14:30	13:00	11:00
1600 – 2359	10:00	9:00	9:00	9:00	8:00	8:00	14:00	12:30	11:00	15:00	13:30	11:30	9:00	8:00	8:00	8:00	7:00	7:00	12:00	10:30	9:00	13:00	11:30	9:30

Crew Member is in an Unknown State of Acclimatisation

Duration of off-duty period immediately before the FDP	Maximum FDP												Maximum Flight time in FDP											
	2 Pilots						3 Pilots			4 Pilots			2 Pilots						3 Pilots			4 Pilots		
	According to sectors to be flown						According to In-flight rest facility						According to sectors to be flown						According to In-flight rest facility					
	1-2	3	4	5	6	7+	Class 1	Class 2	Class 3	Class 1	Class 2	Class 3	1-2	3	4	5	6	7+	Class 1	Class 2	Class 3	Class 1	Class 2	Class 3
Less than 30 hours	11:00	10:00	10:00	9:00	9:00	9:00	14:00	12:30	11:00	15:00	13:30	11:30	9:00	8:00	8:00	8:00	8:00	8:00	12:00	10:30	9:00	13:00	11:30	9:30
30 hours or more	12:00	11:00	11:00	10:00	10:00	9:00	15:00	13:30	12:00	16:30	15:00	13:00	9:00	9:00	9:00	8:00	8:00	8:00	13:00	11:30	10:00	14:30	13:00	11:00



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Required ODP after FDP

Displacement Time =

TZ offset at Start of OFP – TZ offset at Start of the FDP.

Displacement Adjustment:

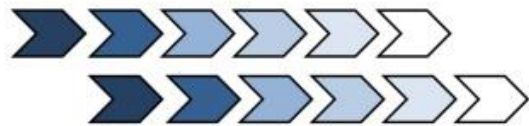
- By default Displacement Adjustment is **0:00**
- If the Displacement Time Is greater than **2:00** then
 - Displacement Adjustment =
Displacement Time - **2:00**
- If the Displacement Time Is less than **-3:00** then
 - Displacement Adjustment =
-3:00 - Displacement Time

FDP Adjustment :

- By default FDP Adjustment is **0:00**
- If the FDP Time Is greater than **12:00** then
 - FDP Adjustment =
 $1.5 * (\text{FDP Time} - 12:00)$

ODP At Base	
Primary Condition	Required ODP
FDP Time > 12:00 and FCM is Acclimated	12:00 Plus Displacement Adjustment Plus FDP Adjustment
FDP Time > 12:00 and FCM is in an Unknown State Acclimatisation	14:00 Plus Displacement Adjustment Plus FDP Adjustment
<= 12:00	12:00 Plus Displacement Adjustment

ODP Away From Base	
Primary Condition	Required ODP
FDP Time > 12:00 and FCM is Acclimated	12:00 Plus Displacement Adjustment Plus FDP Adjustment
FDP Time > 12:00 and FCM is in an Unknown State of Acclimatisation	14:00 Plus Displacement Adjustment Plus FDP Adjustment
<= 12:00	10:00 Plus Displacement Adjustment



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Permitted Reduction of ODP Away from Base

Reduced ODP Away from Base

Primary Condition	Secondary Conditions	Permitted Reduced ODP
FDP Time ≤ 10:00	FCM is Acclimated at start of ODP	9:00
	ODP will provide a LNR	
	The next ODP is ≥ 12:00 with a LNR	
Required ODP > 14:00	FDP is not extended past the FDP limit	14:00
	The FCM will begin the next FDP in an acclimated state	
	The ODP following the next FDP is at least 36:00 with 2 LNR	

Required ODP in 168:00 28 & 84 Cal. Days

Weekly ODP

- In any **168** hr period looking back from the scheduled end of a FDP or standby, a crewmember must have been given an ODP within that same 168 hr span that is
 - no less than **36:00**,
 - and includes **2 LNR**
- The ODP may be at or away from base.

Required ODP in any 28 days and in any 84 days

- In any **28** calendar day period looking back from the scheduled Start of a FDP or Standby, a crewmember must have been given at least **7** calendar days (**0:00 to 24:00**) as an ODP within that same 28 day span.
- In any **84** calendar day period looking back from the scheduled Start of a FDP or Standby, a crewmember must have been given at least **24** calendar days (**0:00 to 24:00**) as an ODP within that same **84** day span.
- The ODP may be at or away from base.



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Standby (SBY) Limits

- The Max Time a FCM may be assigned to SBY is **16:00**.
- A FCM assigned to SBY without a callout to FDP must be given a minimum ODP of **10:00**.
- A FCM assigned to SBY for more than **12:00** and assigned to a FDP without an intervening ODP has a scheduled FDP limit that must be **decreased** by the amount of SBY time in excess of **12:00**.

Delayed Report Time

No Operations Manual Procedures

Amount of Notification	FDP Limit Based Upon	FDP start time
>= 10:00	Revised FDP Start time	Revised FDP Start time
< 10:00	More Limiting of the Revised FDP start time or the Original FDP start time	Original FDP start time



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Delayed Report Time Under Operations Manual Procedures		
Amount of Notification	FDP Limit Based Upon	Amount of Delay
>= 2:00 at base	Revised FDP Start time	Is Considered Standby
< 2:00 at base	Original FDP Start Time	Is Considered FDP
>= 1:00 away from base	Revised FDP Start time	Is Considered Standby
< 1:00 away from base	Original FDP Start Time	Is Considered FDP



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A single delay of at least 10 hours under operations manual procedures

If the period of any single delay to an FCM's FDP is at least **10** hours:

- The AOC may consider that period an ODP; and
- May assign the FCM to a FDP or standby at the end of the ODP.

Maximum FDP after delay under operations manual procedures

Amount of Delay	FDP Limit	FDP start time
< 4:00	More Limiting of Revised FDP Start time, or Original FDP Start Time	Is Considered Revised FDP Start time
>= 4:00	More Limiting of Original FDP Start Time plus 4:00, or Original FDP Start Time	Is Considered Original FDP Start Time plus 4:00

Cancellations — with or without operations manual procedures for delays

If a FCM reports for a FDP and the subsequent FDP is canceled by the AOC:

- The FCM must be released into an ODP that is at least 10:00, starting at the time of notification