Dedicated to innovation in aerospace

Finnish Institute of
Occupational Health

Stockholm
University

DLR

JEPPESEN.

Training module FTL2.0 data collection campaign

EASA
European Aviation Safety Agency

Overview FTL Data Collection Campaign

- ✓ Voluntary participation
- ✓ Data collection via Fit4Duty app on a dedicated smartphone and Actiwatch
- ✓ Total of **14 consecutive days**, ideally starting with a period of 2 days off
  - • Enter and maintain your flight duties and sleep/wake history
  - • Wear the Actiwatch
  - • Score sleepiness and fatigue daily at the moments indicated in app
  - • 3-minute reaction time test before and after the duty
- ✓ For every day that you enter data, you will be raising money for charity. For Wideroe, Drømmeflyet was chosen.
- ✓ Try to fill out as much questionnaires for each (duty) day, but at least those for the start and end of the duty.
- ✓ Do not give in if you miss out on a few measurements - all input is valuable!

Background to the FTL Research Study

EASA has set up a second research study to perform **a review of the effectiveness of the flight and duty time limitations (FTL) and rest requirements** applicable as of 18 February 2016.

The objective is to **collect aircrew data on fatigue, alertness, workload and sleep** to determine whether these rules provide sufficient protection from aircrew fatigue. If necessary, as a result of this study, recommendations will be drafted for changes to the rules. So your participation is of crucial importance.

This review of the Flight Time Limitations (FTL) is being performed by the Netherlands Aerospace Centre NLR, in collaboration with Stockholm University, German Aerospace Centre DLR, the Finnish Institute of Occupational Health (FIOH), and Jeppesen.

Data Collection Campaign

✓ The FTL data collection campaign requires your **participation for two weeks.**
✓ Each day you are asked – during your normal flight duties and during days off – to fill in the questions in the app on the smartphone received, and to continuously wear an Actiwatch
✓ In total this takes about **15 minutes of your time per day**
✓ The data collection is never to conflict with the performance of your duties

Usage and Storage of your Data

✓ The gathered data will remain confidential and anonymous since your personal information is irrelevant to the needs of the research study
✓ At the end of the data collection period you are asked to return the devices as soon as possible
✓ The data of the app will be transferred (via encrypted technology) through a simcard and stored in a password-protected central database that can be accessed by study team members only
✓ It is **not** allowed to use the smartphone for anything else than the study purposes
✓ The collected datasets will not be disclosed to third parties during or after the study's lifetime or beyond

Actiwatch operating instructions

How to handle the Actiwatch

✓ Wear it for the full data collection period

✓ Wear it on the wrist on your **non-dominant hand**

✓ Press the button on the **left side firmly for approximately 3 seconds** each time you plan to sleep or take a nap

✓ The watch is water resistant but … please take it off when you take a shower or go for a swim

✓ It records data on an internal chip, it does not transmit data

✓ After the study period, put the Actiwatch and phone in the case and hand it in at the location where you picked up the devices as soon as possible. **If you need any help, please contact ftl2@nlr.nl.**

Daily data collection

Off-duty days

✓ During off-duty, besides wearing the Actiwatch, you are asked to:

- • Rate your level of sleepiness and fatigue on the two rating scales
- • Keep a sleep/wake log about your sleep length and quality

Using the Fit4Duty App

Using the app
✓ Unlock the phone provided to you and click on the Fit4Duty app on the home screen
  - All the moments during which you are asked to complete the tasks are described in separate boxes
  - By clicking on the three stripes in the top left corner, you can find a button for sending feedback if you wish to do so
✓ Please follow the instructions when progressing through the tasks
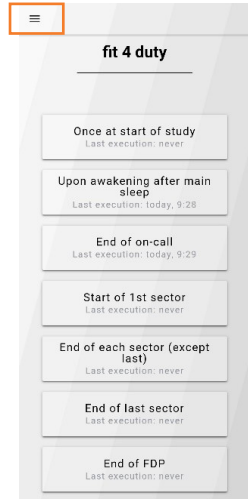
Opening the app for the first time
Complete the task "Once at start of study"
✓ Enter your participant ID
✓ Enter your case number
✓ Submit the questionnaire
✓ Practice the PVT

Familiarisation
✓ Try to get acquainted with the app before you start collecting data
✓ Try to **practice** the reaction time task (PVT) at least three times, you can find it under the task "Once at start of study"
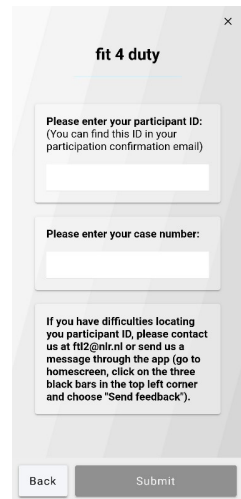
PLEASE ENSURE THAT YOUR PHONE IS SUFFICIENTLY CHARGED AT ALL TIME, THROUGHOUT THE WHOLE DATA COLLECTION PERIOD

During each day of the data collection period in which you have a flight duty period you will be asked to do the following:

Wake-up
- ✓ Sleep/wake log

Flight duty period
Start of 1st sector
- ✓ KSS, SP & PVT

End of each sector (except last)
- ✓ KSS & SP

End of last sector
- ✓ KSS, SP & PVT

End of flight duty period
- ✓ Workload
- ✓ Flight duty log
- ✓ Controlled and in-flight rest

Naps (and main sleep)
- ✓ Before: press Actiwatch button
- ✓ After: sleep/wake log

After waking up from your main sleep of the day

In the main menu of the Fit4Duty app, click "Upon awakening after main sleep"

- ✓ Fill in the details about your sleep and sleep quality
- ✓ Fill in the questions regarding your upcoming duty
  - • If you have an **on-call duty**, please also fill in the "end of on-call" task
  - • In the **end of on-call** task, please give details regarding the type of on-call duty, the start- and end time of your on-call duty, and whether you were called for flight duty
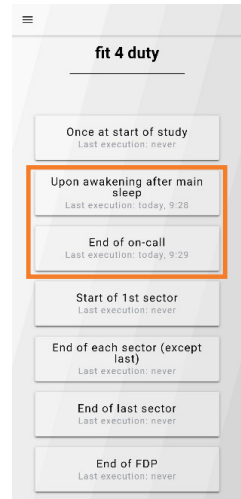
PLEASE ALWAYS USE LOCAL TIME TO FILL OUT THE QUESTIONNAIRES! SO USE THE TIME OF YOUR DEPARTURE AIRPORT FOR THE QUESTIONNAIRES 'AT START OF 1ST SECTOR'. USE THE TIME OF YOUR ARRIVAL AIRPORT FOR THE QUESTIONNAIRES 'END OF EACH SECTOR (EXCEPT LAST)', 'END OF LAST SECTOR', AND 'END OF FDP'.
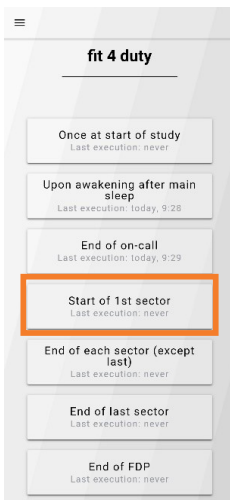
At the start of your **first** sector

In the main menu, go to **Start of 1st sector** and provide information about:

- ✓ The start of your Flight Duty Period (FDP) **and** the start time of your first sector
- ✓ The departure airport (IATA code)
- ✓ Fill in the questionnaires
  - • Sleepiness and fatigue ratings (KSS & SP)
  - • Reaction time test (3-minute PVT)
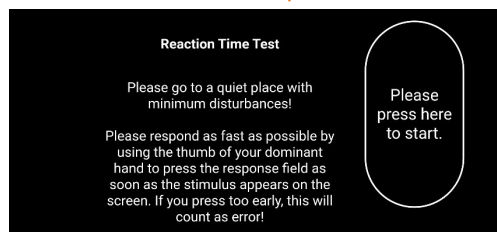
After each sector (except the last sector)

In the main menu of the app, go to **End of each sector** (except last) and fill in:

✓ Fill in :
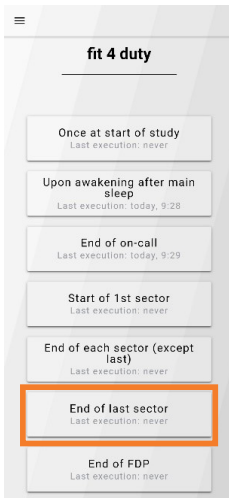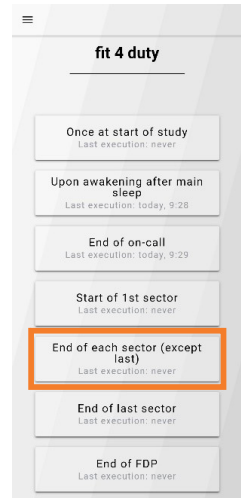- Sleepiness (KSS)
- Fatigue (SP)

At the end of the last sector

Please fill in the following questions regarding your **last sector** by clicking on the **end of last sector** button and filling in:

✓ The end time of your last sector

✓ The arrival airport

✓ Fill in the questionnaires:
- The sleepiness (KSS) and fatigue (SP) ratings
- Reaction time test (3-minute PVT)

At the end of your flight duty period

After finishing each Flight Duty Period (FDP), please click on the **end of FDP** button on the home screen of the Fit4Duty app:

✓ Workload & mental effort during the whole FDP

✓ Details about your FDP, your role & the aircraft

✓ Did you have any rest periods? If so provide info about:
- Controlled rest (CR)
- In-flight rest
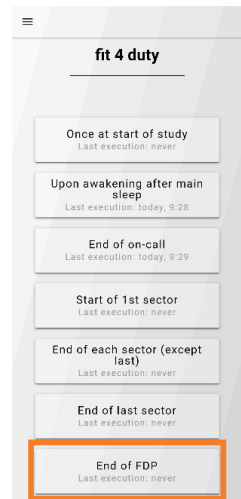
PLEASE FILL OUT AS MANY "DUTY" DAYS AND QUESTIONS/TASKS INVOLVED IN THE DATA COLLECTION PERIOD AS POSSIBLE, ALL INPUT IS VALUABLE FOR THE STUDY PURPOSES!

All naps and sleeps during time off, i.e. not during flights

During the study period, please log **all naps and sleeps** during time off (excluding main sleep) which you have, under the button "Naps" at the bottom of the home screen in the Fit4Duty app. For each nap and/or sleep, please remember to do the following things:
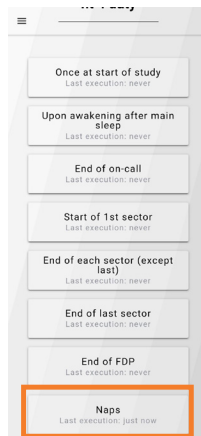
- ✓ Fill in the start- and end times of your nap or sleep
- ✓ Fill in how many minutes you actually slept
- ✓ Press the button on your Actiwatch **firmly for 3 seconds** every time you go to sleep

Common definitions

Below, you can find a list of definitions of common concepts that are used during the data collection period. Please familiarise yourself with these terms to help you complete the tasks.

- ✓ **Fatigue**. A physiological state of reduced mental or physical performance capability resulting from sleep loss or extended wakefulness, circadian phase, or workload (mental and/or physical activity) that can impair a crew member's alertness and ability to safely operate an aircraft or perform safety-related duties.
- ✓ **Sleepiness**. The desire to fall asleep. It is sometimes referred to as drowsiness and typically increases the longer we stay awake.
- ✓ **In-flight rest**. Individual crewmembers taking turns leaving their duties, usually for multiple hours, to rest and sleep in designated rest facilities.

IF YOU HAVE QUESTIONS OR REMARKS DURING THE DATA COLLECTION PERIOD, PLEASE DO NOT HESITATE TO REACH OUT USING THE FIT4DUTY APP OR CONTACT FTL2@NLR.NL

- ✓ **Controlled rest (CR)**. In accordance with an approved airline CR procedure, one flight crewmember is temporarily relieved of operational duties, and takes a short, in-seat rest break. This type of rest is typically unscheduled.
- ✓ **Flight Duty Period (FDP)**. A period that begins when a flight crew member is required to report for duty with the intention of conducting a flight, a series of flights, or positioning or ferrying flights, and ends when the aircraft is parked after the last flight and there is no intention for further aircraft movement by the same flight crew member.
- ✓ **Sector**. A flight composed of a take-off, departure, arrival and landing. Multiple sectors can exist within one FDP

COMMON MISTAKES:

- ✓ **Not registering your naps and main sleeps**
- ✓ **Not checking your data connection from time to time**
  The phone needs mobile data to upload the data to the servers.
  Please remember to take your phone off "plane mode" and
  connect your phone to wifi if you wish.
- ✓ **Not finishing the PVT.** While the task may seem to take long, it is only 3 minutes and this data is of vital importance to the study.
  Please complete it to the best of your ability.
- ✓ **Using the wrong time while filling out the questionnaires.** Please always use local time to fill out the questionnaires. You can use the time zone of your departure airport for the questionnaire before departure (Start of 1st sector) and the time zone of your destination for questionnaires at the end of your sectors and end of FDP.
- ✓ **Filling in the questionnaires at unfavourable times.** It is important that the questions are filled in at the right time, please look at the suggested moments to complete the tasks below.
- ✓ **Forgetting to push the submit button.** Always make sure you submit your questionnaires after filling them in.
- ✓ **Forgetting to fill out details about the end of your duty.** Make sure to fill in the questions regarding the end of the last sector and the end of FDP so that we can determine how long your duty lasted.

When to complete the tasks as a flight crew or cabin crew member?

The moments on which to complete the Fit4Duty tasks may differ between flight crew and cabin crew members. This can be due to timing, allocated flight tasks and/or knowledge of the stage of the flight. Please find below a table with the suggested time slots for each task in the Fit4Duty app.

✓ Please familiarise yourself with the suggested timings and stick to the allocated time slots as much as possible!

✓ Please mind that these are suggestions only. If you find that you are unable to complete the Fit4Duty tasks at the suggested time slots and feel like you have time slots that work better for you. Feel free to do so.

• Do not forget to turn your phone to **airplane mode** during flight

Task	Ideal time	Alternative time
Once at start of study	When receiving the materials	
Upon awakening after main sleep	Straight after waking up	
End of on-call	Straight after ending your on-call duty (end time or just after duty call)	
Start of 1st sector	At the start of your first sector, already having started FDP	Upon arrival at the airport
End of each sector (except last)	After landing, before start next sector	
End of last sector	After landing the last flight of your duty period	
End of FDP	Between ending the FDP (blocks on) and signing off for duty	Just before departure to home (or hotel)
Naps	At the end of the day, logging all the sleeps for that day	After each sleep

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Please return the materials to the location where you picked them up at the start of the data collection campaign before June 30th.

If unsure, please contact ftl2@nlr.nl or use the Fit4Duty app to send your question using the "Send Feedback" button.

THANK YOU FOR PARTICIPATING!

If you have any questions, please contact one of the principal investigators through ftl2@nlr.nl
NLR - NETHERLANDS AEROSPACE CENTRE