12.07.2018

1. Introduction

This evaluation record provides competent authority staff with a framework to assist in the evaluation of an individual flight time specification scheme (IFTSS). The objective is to provide a structured and proportionate approach for the application of ARO.OPS.235 and ORO.FTL.125.

How to use the evaluation record

This evaluation record is recommended for use by the competent authority for the purpose of the following types of evaluations:

- type (1) evaluation of an IFTSS that is based on Subpart FTL and CS-FTL; when a fatigue risk management (FRM) is required, type (1) is combined with evaluation of an operator's FRM in accordance with ORO.FTL.120 i.e. type (1+); or
- type (2) evaluation of an IFTSS that deviates from the CS-FTL or derogates from Subpart FTL; when an FRM is required, type (2) is combined with evaluation of an operator's FRM in accordance with ORO.FTL.120 i.e. type (2+).

Most operators' IFTSS are within the limits of Subpart FTL and CS-FTL. Such IFTSS would require type (1) evaluation.

The evaluation of an IFTSS where the operator proposes to apply higher daily FDP limits to crew members in unknown state of acclimatisation (Table 4 of ORO.FTL.205 (b) (3)) or reduced rest periods (12 hours at home base or 10 hours away from base), is an example of type (1+) evaluation.

An operator who, for example, has more than one airport location assigned as a home base, has an IFTSS that deviates from CS FTL 1.200. Such IFTSS requires type (2) evaluation.

An IFTSS that proposes, for example, rotations with reduced rest of less than 12 hours at home base or 10 hours away from base, is subject to type (2+) evaluation.

The record may also be used by operators to prepare for competent authority's evaluation.

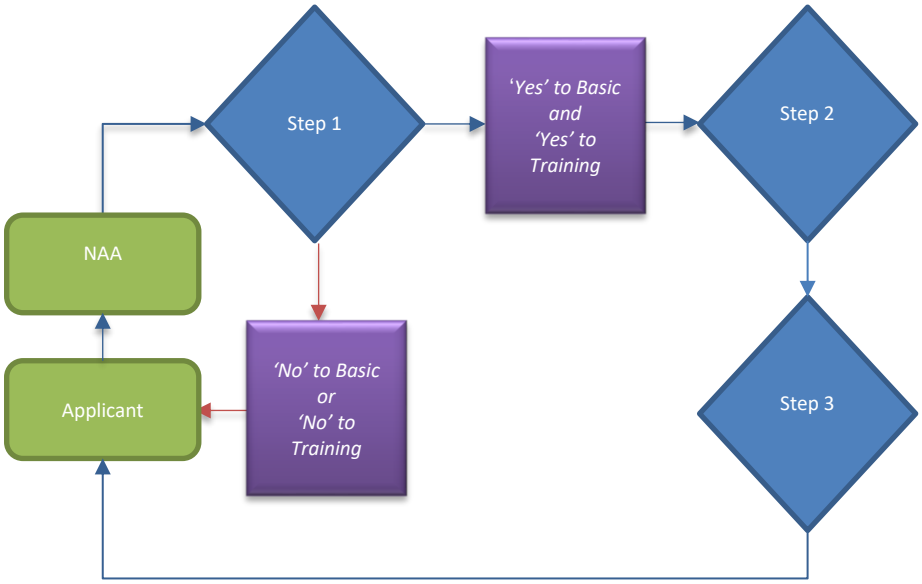
It is competent authority responsibility to review the documentation submitted by an operator. The competent authority needs to be satisfied that the submission is relevant to that operator's operational context. The processes and procedures described by the operator must be robust enough to identify and manage any direct or indirect impacts on fatigue levels.

Also, deviations or derogations from IRs or CS-FTL, respectively, might have intended and unintended consequences. These consequences should be accounted for in the operator's safety risk assessment as they could have impact on crew members' performance leading to safety relevant outcomes. Examples of these safety relevant outcomes include wrong performance calculation, unstabilised approach, impaired situation awareness, poor CRM, etc. (list not exhaustive). The goal of any safety risk assessment is to identify safety hazards entailed by the activities of the operator, evaluate the potential safety risks and keep them at an acceptable level by means of mitigating measures [ref. ORO.GEN.200(a)(3)].

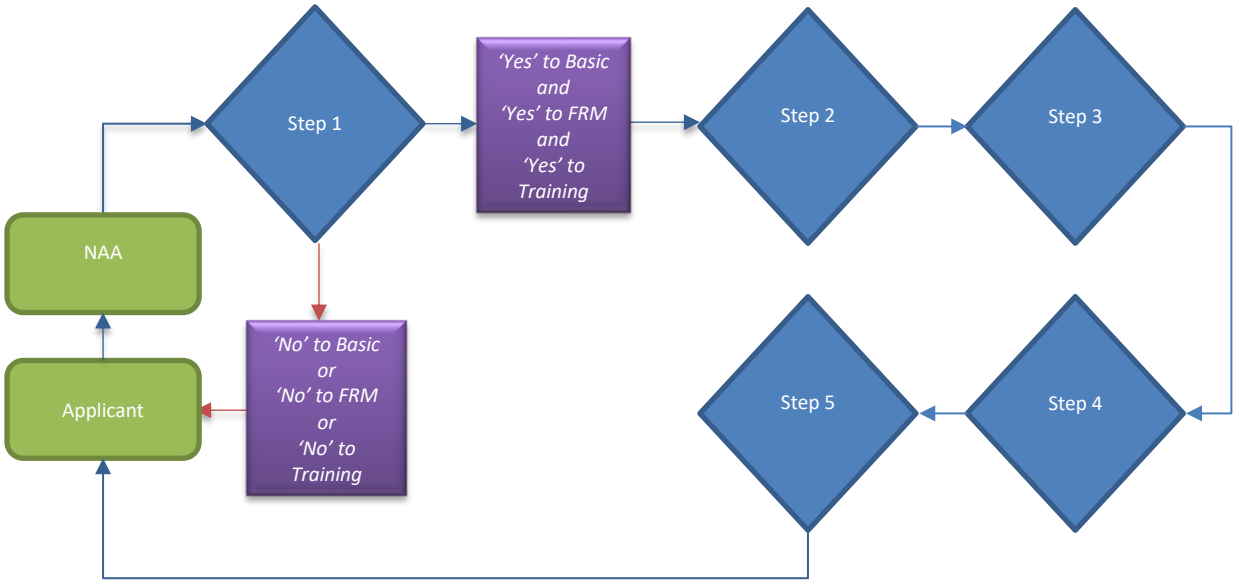
Steps

The review consists of three (3) or five (5) consequential steps, depending on the type of evaluations:
Each step is addressed in more detail under point 2.

The following flow chart depicts type (1) and (2) evaluations process and its steps:



The following flow chart depicts type (1+) and (2+) evaluations process and its steps:



1.1 Assessment of the organizational capability

Step 1 is appropriate for all types of evaluations mentioned above.

It is assumed that any CAT operator has already established a safety risk management process (SMS) within its organisation and is therefore able to manage a 'regular' IFTSS. The question is whether the SMS is mature enough to support a deviating IFTSS, as the case may be, even if the operator does not meet ORO.FTL.120.

Taking into account the results of past oversight and current maturity and performance assessments of the organisation's (safety) management system, the competent authority determines if the organisation is able to manage an IFTSS.

Newly established organisations or organisations with outstanding findings directly or indirectly stemming from deficiencies in the safety risk management process, should not be authorised to implement a deviating IFTSS.

Fatigue risks stemming from reduced rest or from assigning longer duties to crew members in unknown state of acclimatisation are to be managed under FRM. In those cases compliance with ORO.FTL.120 is a prerequisite for further processing the operator's application. Otherwise, the review of the application should stop here and be referred back to the operator for further work on problem areas. The operator may then re-submit or apply again, depending on the situation.

In cases where an appropriate fatigue risk management is required in lieu of full compliance with ORO.FTL.120, such as night duties of more than 10 hours, evaluation steps 1-3 suffice. However, step 4 may be used to make an estimate of the operator's readiness to use fatigue management principles in rostering long night duties.

1.2 Assessment of the nature and scope of the proposed IFTSS

Step 2 is appropriate for any type of evaluation. The competent authority assesses if the nature, scope and operational environment of the proposed IFTSS are comprehensively described.

1.3 Hazard and consequences identification and risk assessment methodology

Step 3 is relevant for type (1+) and type (2+) evaluations, whereby the competent authority should review the operator's FRM as an integral part of its management system and in particular its capabilities to appropriately identify fatigue hazards originating from its operations, assess and mitigate the associated risks and control their consequences.

It is also appropriate for type (1) and type (2) evaluations.

The competent authority should be satisfied that an appropriate risk assessment methodology has been applied and documented by the operator. This step puts more emphasis on the tools and methods used by the operator to prepare a robust risk assessment. For that purpose, the competent authority reviews the risk assessment in terms of hazard identification and analysis of likelihood and severity of the consequences. The hazards identified have to be consistent with the proposed IFTSS and their consequences have to address the worst possible scenario.

1.4 Safety case supported by a safety risk assessment

Step 4 is appropriate fortype (2) or type (2+) evaluations.

The competent authority should be satisfied that a robust safety case has been developed to demonstrate that the proposed deviation or derogation does not increase the level of fatigue and decrease the level of alertness.

The safety case must be developed with the help of research based on scientific methods and/or results of other operators studies under the conditions listed below. The competent authority should study:

- the Safety case to understand the expected impact of the proposed IFTSS on fatigue levels (against a performance baseline);
- the tools used to collect data (e.g. FDM events, crew reporting, actigraphy, sleep diaries, PVT, subjective fatigue and sleepiness ratings, independent scientific team, focus groups); and
- proposed metrics to assess data (operational SPIs or crew fatigue SPIs, threshold values on bio-mathematical model predictions).

Operator's submitted documentation should clearly indicate baseline fatigue and alertness levels of aircrew concerned by the IFTSS. For example, if specific operational needs require a deviation from minimum rest CS of 10 hours, the operator should have first monitored and measured the level of fatigue in a representative sample of flights with minimum rest of 10 hours (baseline performance) before applying for reduced rest periods.

Furthermore, the competent authority has to be satisfied that the data collected or to be collected and used, comes from a representative sample of affected crew members. The safety case, should contain an explanation of the amount of respondents needed to get statistically meaningful results, taking into account the size of operation subject to the deviation / derogation (e.g. a specific rotation operated with one aircraft type).

The Safety case must contain a carefully formed hypothesis and a clearly stated outcome measure confirming that an acceptable level of safety performance may be maintained, even if the IFTSS deviates from the CS-FTL or derogate from the IRs. The hypothesis and outcome must be supported by the safety risk assessment results.

The competent authority should be satisfied that the identified risks are mitigated. The purpose of mitigation measures is to reduce the level of risk to an acceptable level. The proposed mitigating actions must take into account all legal requirements applicable to the worker (e.g. national, international, safety, social). Last but not least, clear conclusions must be included in the safety case.

The safety case elements should be used by operators when initially applying for a temporary IFTSS approval and subsequently for its validation. For example, for the initial approval of an IFTSS requiring FRM, more emphasis should be put on predictive bio-mathematical methods; for its validation, well-validated operational data based on a combination of scientific methods, including statistical methods, needs to be provided.

The operator may also use the results of other operators, on the condition that the flights are at least:

- similar in duration and operating environment;
- operated in the same time zone or across the same number of time zones in the same direction;
- operated with aircraft of the same type and configuration (including rest facilities, if applicable);
- operated with the same number of aircrew members;
- operated at the same time of day;
- operated with the same level of cabin service.

The competent authority should be satisfied that the operator, before using other operators' data, has assessed the similarity of all conditions that might have an impact on fatigue.

1.5 Validation

This step is relevant for type (2) or type (2+) evaluations.

The competent authority should assess the operator's safety assurance process for the continuous monitoring of the IFTSS safety performance, including the verification that the assumptions on which the Safety case has been developed are still valid and that mitigating measures in place are actually working. The result of the validation should demonstrate a safety (fatigue) level comparable to the baseline performance. The time-frame during which a temporarily approved IFTSS may be applied should allow comprehensive data to be collected and analysed, but should not be longer than 2 years.

Individual Flight Time Specification Scheme Assessment Evaluation Record

Operator:	**Type of evaluation:** **Legal reference:**
Point of Contact in the Operator:	**Revision / issue No.**
Assigned competent authority officer:	**Date:**
Project/File Ref:	**Date received:**

2. Detailed assessment

2.1 Step 1. Assessment of the organisational capability.

This step is appropriate for all types of evaluations mentioned above. It contains questions clustered in three parts: Basic, FRM and Training.

Basic	• Does the operator comply with ORO.FTL.110? • Does the operator have processes to compare flight and duty time and rest periods of actual operations with what was originally planned, to identify times in a schedule when fatigue levels might be higher than expected; to make adjustments of limits and schedules to accommodate duties or tasks that could significantly increase fatigue? • Does the operator have processes for reporting fatigue related issues, including “unfit for duty” due to fatigue? • Does the operator have processes for keeping records on duty times and off-duty times and the analysis of such data? • Does the operator measure and track data related to roster disruption, roster stability, delay on specific schedule, etc.? • Does the operator track the trend of commander’s discretions on a seasonal basis? • Does the operator process fatigue reports such as ASR/MOR? • Are hazards identification, risk assessments and mitigation actions adequate to the activities of the operator? • Have corrective actions addressing findings directly or indirectly stemming from deficiencies in the SMS, been adequate to the requirements and type of operations?	Yes	No

	Note: Newly established organisations or organisations with outstanding findings directly or indirectly stemming from deficiencies in the SMS, should not be authorised to implement a deviating IFTSS.		
FRM	If applicable, does the operator have FRM in accordance with ORO.FTL.120? • Has the operator assigned responsibilities for fatigue risk management, e.g. to a fatigue manager? • Will scientific or other consultants be involved in the deployment of the IFTSS? *Note: The functions of fatigue manager may have been combined with other safety related functions.*	Yes	No
Training	Has the operator provided initial fatigue management training to its crew members, rostering staff and managers in accordance with ORO.FTL.250, tailored to the proposed IFTSS?	Yes	No

For type (1) and type (2) evaluations, proceed to step 2, if the answer is 'yes' in the Basic and Training parts, at least.

For type (1+) and type (2+) evaluations, proceed to step 2, if the answer is 'yes' in all three parts.

2.2 Step 2. Assessment of the nature and scope of the proposed IFTSS

This step is appropriate for any type of evaluations mentioned above		
Actions	**Evaluation guidance**	**Comments:**
Review the documentation to determine whether it comprehensively and adequately describes the nature and scope of the IFTSS.	• a clear and comprehensive description of the flights to be operated under the IFTSS (under the deviation/derogation, if applicable) • a clear statement about the extent and duration of the initial (trial) period[1], if applicable. • it is necessary to check if the draft provisions of OM (chapter 7) reflect correctly the IR, CS, AMC and are considering EASA GM • if applicable, it is necessary to check the legal basis of the requested deviation/derogation and its rationale	
Review the documentation to determine whether the IFTSS considers the environment in which the operator operate.	Have at least the following been considered? • Affected staff • Procedures • Equipment that has an impact on the IFTSS • Physical environment • Operator's safety culture • Legal and regulatory environment • External threats	

[1] An IFTSS of type (2) or of type (2+) usually contains an initial (trial) period of implementation. If not explicitly mentioned, the initial period is understood to be 2 years from the approval of the particular deviation or derogation (ORO.FTL.125 (d)).

2.3 Step 3. Evaluation of operator's hazard and consequences identification and risk assessment methods

This step is relevant for any type of evaluation		
Actions	**Evaluation Guidance**	**Comments**
Have appropriate likelihood and severity definitions been used to classify the consequences of the proposed IFTSS?	• This may be qualitative definitions supported by expert judgement or quantitative definitions when data is available.	
Has a risk tolerability matrix been defined and used with regard to the IFTSS?	• The risk exposure and tolerability levels must be realistic and proportionate to the operation.	
Have the likelihood and severity for each fatigue consequence been recorded and an overall risk score calculated?	• Is the likelihood, severity and risk scored before and after mitigating action has been taken? • Does the classification match the definitions? • Is the classification reasonable? • Does the risk score match the risk tolerability matrix / classification?	
Have the effectiveness of existing barriers and defenses been assessed?	• Is the operator process adequate? • Have internal safety audits been conducted to assess the effectiveness of existing barriers?	
Has the risk been accepted by the accountable manager?	• Where a risk remains tolerable, has the decision to accept this risk been made by an appropriate level of accountability (i.e. nominated person flight ops)? • Has the risk assessment been discussed in the SRB?	

2.4 Step 4. Assessing the Safety case and supporting Risk assessment (RA)

The competent authority assesses the safety case and supporting safety risk assessment documentation in the case of type (2) or type (2+) evaluations

Actions	Evaluation Guidance	Comments
Check if *the Safety case* contains at least the following: - Problem definition - Risk assessment - Base line - Scientific method of collecting data - Representative sample - period for the collection of data - impacts on fatigue - other consequences	• the problem (objective) should be clearly defined; it should refer to the baseline performance in terms of fatigue and alertness; • the RA should identify all fatigue hazards and consequences relevant to the particular operation, including human performance related hazards other than fatigue and their consequences; • the RA should account for the particular working conditions, crew accommodation and positioning (including commuting), as well as for hazards posed by other activities and/or services; • the RA should identify what data and how it should be collected during the initial (trial) period; • the operator defines the baseline levels of fatigue and alertness, using for example an operation within the envelope of prescriptive rules, against which the intended IFTSS will be measured; • the operator should use subjective and objective tools (e.g. sleep diary; actigraphy; a TOD survey based on Samn-Perelli scale; a KSS scale) to measure sleep duration and quality, sleep deprivation, aircrew fatigue and performance levels, to collect data for the purpose of establishing the baseline as well as for the validation of the IFTSS; • the operator needs to propose metrics to assess data (operational SPIs or crew fatigue SPIs, threshold values on bio-mathematical model predictions); • the data and methods to establish the baseline must be compatible to the data and	

	methods to establish fatigue and alertness under the deviation/derogation; • the sample of participants should be as representative as possible for the aircrew population of the operator that is affected by the IFTSS; • the length of the period for the collection of data should allow for conclusions about the impact on the levels of fatigue and alertness of the involved crew members; • the analysis of the impact of the deviation/derogation on the levels of fatigue and alertness of the involved crew members, including impact on both transient and cumulative fatigue, should be based on scientific principles; • the RA should include an analysis of the potential impact of proposed IFTSS on other operations; • fatigue risk controls must be implemented during the trial to prevent risks from leading to an occurrence or prevent the escalation of the consequences; • the effectiveness of those controls should be measured and monitored; • the operator should produce clear conclusions about expected results (referring to the problem/objective)	
Are the safety arguments sound?	Are the safety arguments supported by the safety risk assessment results? The identified risks should be mitigated and the barriers should ensure that an equivalent level of protection from fatigue hazard may be maintained during the initial (trial) period. The residual risk arising from fatigue been calculated after taking into consideration all fatigue mitigations should be known and acceptable to senior management (refer to the operator's management system accountabilities).	

	Is there an overreliance on human action as a fatigue mitigation? How fail safe and error tolerant is the measure? Proposed mitigation actions must meet the applicable regulatory/legal requirements. A compliance monitoring system feedback loop should be included in the proposed IFTSS.	
Have conclusions for the safety case been included?	The conclusion must clearly state that the IFTSS and the related arrangements can be implemented without an adverse effect on safety.	

2.5 Step 5. Validation

This step is relevant for type (2) and type (2+) evaluations		
Actions	**Evaluation Guidance**	**Comments**
Check operator's plans for validation of the safety case after the trial period has elapsed.	• The length of the trial period should allow for sufficient data gathering. *Note: The length of the trial period is set by the competent authority but cannot be longer than 2 years.* • Does the proposed IFTSS provide for, after being approved, continuous monitoring and measurement of the safety impact of the IFTSS? • Have performance indicators been established? Are they adequate?	
How will the operator check if the assumptions made in the safety case are valid?	• How is the operator going to monitor and review the assumptions after the IFTSS has been implemented? • How will the operator gather sufficient data to support the claims? • The operator should address each assumption against relevant measured data, using the monitoring tools (e.g. surveys, safety audits, etc.) that have been established at the beginning of the trial. • What is the plan if, following the trial, one or more assumptions have not been proven or validated by supporting data?	

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