

***International Fatigue Risk  
Management Forum  
Safety Promotion and Feedback in FRMS***

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***EARLY DRAFT of HILAS Book Chapter***

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## 1. Introduction

In an attempt to bridge the gap between operators, regulators and scientists the International Fatigue Risk Management (FRM) Forum was implemented. The Forum facilitates inter-organisational safety communication and learning and is an extension of the HILAS collaborate network in combination with the HILAS centre of excellence.

The HILAS approach extends the ICAO (2008) SMS framework which states that intrinsic to an operators SMS, promotion of safety in an organization requires a capability of sharing of learned safety lessons learned and best practices through active exchange of safety information. ICAO recommends safety communication through such mechanisms as newsletters to employees, individual investigation feedback, and strategy communication. The Forum further facilitates safety communication by introducing the development of risk data sharing processes between airlines, regulators and scientific organisations allowing inter-organisational learning, the amplification of weak risk signals and faster risk communication between different players.

Developing effective performance-based regulation and supporting organisation derogations from existing regulation is not a simple task. It involves many factors which are not well known, for example:

- How to monitor the performance of complex systems in a valid manner
- How to ensure effective learning and change both within and between organisations, and
- How to regulate for a global system which involves many different types of organisations, in different regions, with different cultures, interacting with each other.

The difficulties of this approach are effectively summed up by a statement from David Learmount at the FRMS Forum inaugural meeting in Farnborough (2009).

*“It's an immensely important subject but it is going to be difficult to get the industry to implement it in an effective way. Lip-service is easy, doing it is not”*

*David Learmount*

*Operations & Safety Editor*

*Flight Group*

## 2. Forum concept of operation

Regulators, Operators and Scientists over the recent years have not functioned effectively in an integrated or coordinated fashion on the issue of fatigue risk management. Individual cases of cooperation have been demonstrated between operator and scientists (Qantas & UNSW Centre of Sleep research: Thomas et al, 2006) and regulator and

operator (easyJet and CAA: Stewart and Abboud 2005) and collectively (ICAO FRMS Subcommittee) however, no central forum has been created that facilitates the interaction between all three groups in an ongoing basis with the objective of understanding operational fatigue related risk and supporting evidenced based rulemaking processes by regulators. This is despite a common objective to facilitate the management of fatigue related risk to the effect that crews can operate safely under all circumstances and customer safety is assured (EASA NPA 2009c). Previous FRMS designs have been based around the capability of predictive models and this is due to the other elements of an FRMS being immature in development (fatigue reporting and investigation of fatigue related risk precursors). Derogations from FTL were being granted that were unsupported by scientific based risk assessment as an acceptable means of compliance (Christie, 2009). Predictive models have in the past have been presented as the cure all for fatigue related risk once integrated against an airline rostering system and have in some cases been miss-used by operators (Dawson, 2009).

Regulators have often been slated as providing the regulatory framework for compliance but have fallen short on provision of implementation guidance. FTL cannot provide controls for all types of operator's flight duties and often is unsupported by scientific evidence (Bader report, 1973). Operators have influenced the development of FTL but have also been accused of complicating the process with Industrial Relations (IR) issues which can dilute the effectiveness of the FTL protections.

Scientists have predominantly conducted domain dependent studies but have been criticized by operators for being unable to operationalise their research (AEA response to EASA Moebus report- EU Commission Fatigue Seminar, 2009).

Fatigue Risk Management is in essence operational science and with the advent of the new EASA NPA 2009 draft regulation operators can no longer construe that compliance with prescriptive limits ensures 'legality' or safety. Operators cannot default to the position that they have an operational SMS as fatigue related risk required that specific tools and methodologies are applied which can measure crew performance through physiological, cognitive, subjective and objective tools (tools-context-people-task, Frei et al, 2003).

In an attempt to bridge the gap between operators, regulators and scientists the International FRMS Forum was implemented. The concept was formulated as an initial idea between Douglas Mellor (Qinetiq) and Simon Stewart (easyJet & HILAS SMS Working Group) in 2008.

The concept of the forum is based around apolitical interdependent operations to support fatigue safe practices. Operators seek flexibility, acceptable risk and minimal costs in pursuit of revenue. This may in turn require derogation from compliance to the general 'one size fits all' FTL scheme promulgated by the NAA which may restrict rostering flexibility. To support the preparation of an acceptable means of compliance the operators must undertake a scientific data driven risk assessment to assure the regulator that an equivalent level of safety to that provided under the FTL is demonstrated. This

risk assessment will be validated by the Regulating Authority (approval) and may be utilized (published to industry with operator permission) to facilitate new rulemaking processes as a form of regulatory and operator learning and memory. The FRMS Cycle (Stewart et al, 2009) (Figure 1) is a continuous improvement cyclical process however, it is recognized that information flows will occur between each actor in the cycle as required to facilitate the process. The Forum will focus on the following areas:

1. Facilitate a best practice library of FRMS in industry inclusive of documentation covering roster/shiftwork schedules and latest regulatory guidance/compliance requirements;
2. Facilitate a general structure of an FRMS manual integrated into a company SMS and fatigue risk assessment tools and processes;
3. Facilitate a general question and answer forum for forum members (vetted by the Forum committee) to exchange points of view and information around management of fatigue as a risk; and
4. Facilitate the representation of service providers to the forum and provide an evaluation review by forum members vetted by the Forum committee.

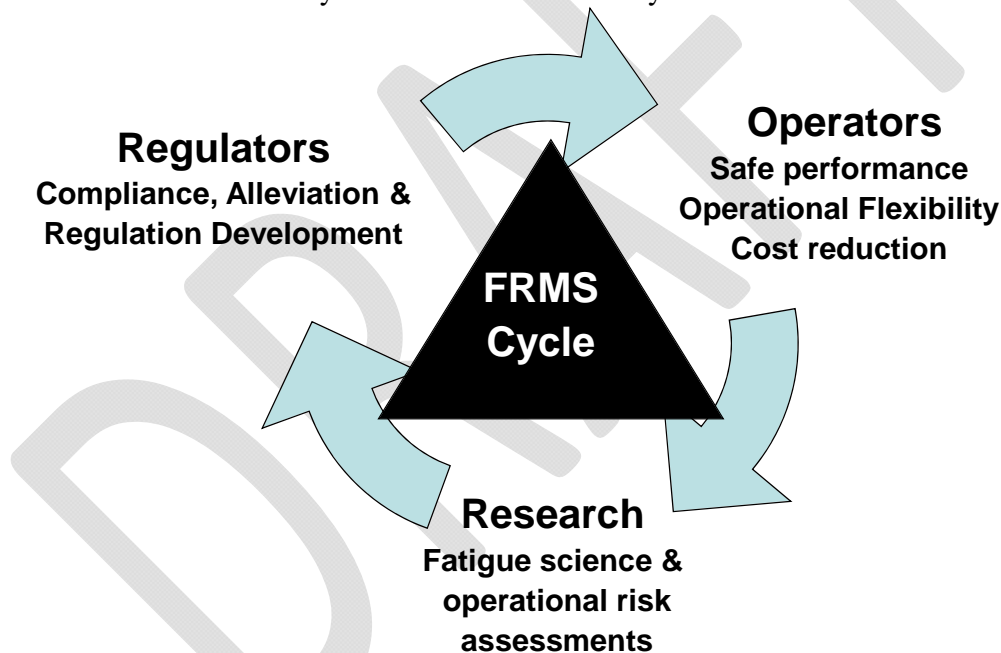


Figure 1. The Fatigue Risk Management Cycle (Stewart et al, 2009)

## 2.1 Intra and inter-organisational feedback

Based on the principles of the System Integrated Risk Assessment (SIRA) Risk Management System (Stewart et al, 2009) the sensory network where a risk radar approach acts as a system sensory net scanning the risk environment gathering a wide range of technical, human performance and system data. The international forum is included into the operator sensory net by providing access to industry best practice and contact with other operators with similar commercial models on the basis of improving industry and individual operator safety performance. It represents a proactive safety

management process to apply knowledge and learning from other operators to facilitate the investigation of operational hazards identified through safety risk management or safety assurance functions. The feedback loop occurs when the risk assessment (operational science) is then promulgated back through the forum to increase industry and regulator awareness and to assist the development of new rulemaking as a form of continuous improvement cycle.

Industry safety trends and risk knowledge can be presented through the operators Safety Action Groups and incorporated as informational articles in newsletter, safety magazine and Fatigue Awareness training programmes.

## **2.2 Forum cycle and Organizational Learning**

The concept of the forum supports the ICAO requirement for inter-organisational sharing of lessons learned from safety incidents and best practice to the industry. This is facilitated through the principles of Organisational Learning (OL) and Organisational Memory (OM) (Koornneef et al, 2009; Koornneef and Hale, 2004a & b) within participating groups (regulators, scientists and operators).

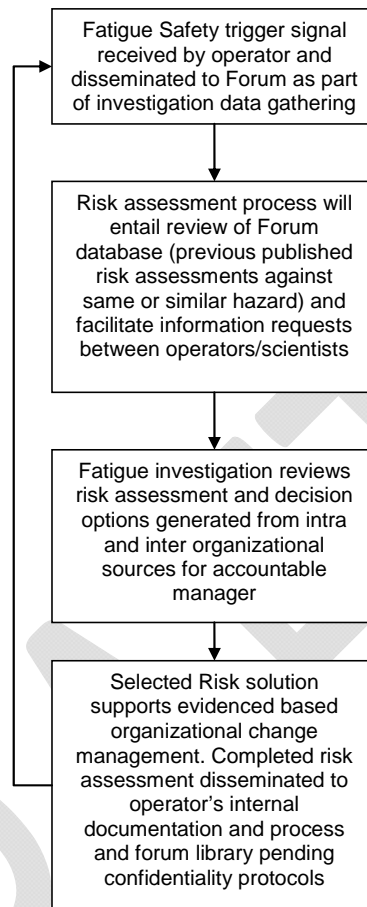
The process of learning, is based on a safety trigger signal from an operator, with an inquiry performed by a Learning Agency (FRMS team working with scientists and support from the regulating authority) and with a learning product stored into some form of OM (protocols, manuals, new regulation or certification standards and operational evidenced based rostering rulesets) that must be accessible and controlled in order to function as memory.

The Forum activity cycle integrates with an operator's FRMS/SMS and will follow a four step feedback process based (Figure 2) on SIRA Risk Management System:

OL-Step 1: The Forum function as an active Community of Practice network where some operator raises a problem (from its own operations) and other network nodes might respond from their own specific perspective (detection – notification to Forum and initiating networked learning agency Inquiry activities).

OL-Step 2: This will lead to a discussion among the respondents in which tacit knowledge is exchanged (confidentiality protocols) through the discussion and participants converge to common understanding and options to solve or manage the problem behind the initial problem raised (as lessons to implement).

OL-Step 3: Fatigue investigation reviews risk assessment and decision options are generated from intra and inter organizational sources for decision by operators accountable manager



**Figure 2.** Forum operator activity cycle

OM-Step 4: Selected Risk solution supports evidenced based organizational change management. Completed risk assessment disseminated to operator's internal documentation and process and forum library pending confidentiality protocols. The outcomes from step 2 be captured and stored into Organisational Memory in a way that it can be retrieved later for reuse or by others who were not a member in the beginning or who did not respond in step 1

### **2.3 Organisational benefits through participation**

By using the forum resources airlines may embrace FRMS requirements by creating their own systems or share the experience of those who are already operating with an FRMS. Generic information can be exchanged between all airlines for the benefit of the whole industry, its employees and customers. A number of airlines have already shared generic

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information and experiences, which has permitted the idea of creating an FRMS Forum thereby encouraging the early adoption of FRMS by other airlines irrespective of size.

Air New Zealand, easyJet, Delta, Virgin, QinetiQ, and UK CAA have started the Forum for the airline industry, to openly discuss FRMS issues and collaboratively build a body of knowledge for the establishment of Best Practise for the unencumbered use of members. It is managed by volunteer, elected members and operated for the benefit of the membership. The forum Chair is held by Dr Curt Graeber, who also chairs the ICAO FRMS sub committee and the FRMS Implementation Task Force Group (Graeber, 2009).

The forum purpose is to provide a vehicle for industry specialists to meet to share knowledge and experiences of creating, developing and managing an FRMS. The output is envisaged to be a shared body of knowledge that is Best Practise for the industry. This may take the form of a number of downloadable documents and templates on a web site that member can freely use and modify for their own use provided that they return to present any significant developments to the Forum in order to improve Best Practise.

It is proposed that this independent organisation will meet three times per year to learn from the experience of a number of speakers drawn from the airline industry and from time to time, the regulator and pilot communities and any other appropriate and relevant body.

The initial benefits of membership will be

- Free access to a growing body of knowledge
- Ability to contribute to Best Practise for the industry
- Education – understand the maturity of the knowledge base within the industry and be able to select the right tools and experiences for your situation
- Networking opportunities within the airline industry and the Regulator community to both bring and offer new insights on the challenges and guidance on managing fatigue.
- Access to a web portal to freely download and use elements of a body of knowledge comprising presentations, templates, case studies, notes, regulations and guidance documents as they become available

The forum has at present 165 members representing 65 organisations including 20 large international airlines.

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International FRMS Forum weblink: [www.frmsforum.com](http://www.frmsforum.com)