

HOP!

HOP!

Workshop on the Approval and Oversight of
Fatigue Risk Management (FRM)
Cologne 26th November 2014.

What is HOP! ?

- Hop was born in April 2013 with the union of 3 French airlines, Airlinair, Britair and Régional. Hop is wholly-owned subsidiary of Air France.

- Hop! in few figures

Number of employees : 3 100 (1 640 for Régional, 900 for Britair, 730 for Airlinair and 40 for Hop)

Flight Staff : 1 630 (900 cockpit crew and 730 cabin crew)

Number of aircrafts in operation : 20 ATR (Airlinair)

25 Bombardier (CRJ 1000, CRJ 700, CRJ 100)

34 Embraer (EJET 170 &190, ERJ)

Network is spread across Europe and 500 flights are operated each day by the 3 airlines, specifically in short haul.



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- Between 2000 and 2013 for the 3 airlines, around 670 000 flights were performed after a Reduced Rest, and around 320 000 flights since the implementation of the « Arrêté Français » in march 2008.
 - Today, two third of crew's pairing are built with Reduced Rest.

Main Flight Time Limitations for Reduced Rest.

- The minimum reduced rest periods is 7h30,
- The rest period following the reduced rest is extended by the difference between the minimum rest period and the reduced rest.
- The rest period following the reduced rest must include a local night,
- The maximum number of flights before RR is 5 and after a RR is 3.

To complete these Flight limitations, Hop!'s airlines had implemented additional measures, such as:

- 11 days off per month,
- a period of 4 consecutive days off per month
- Maximum of 56 hours of duty per 7 days,
- ...

- FRMS had been implemented in HOP! 's airlines, including :

- A Fatigue Risk Management System policy,
- A documentation of FRMS processes,
- A risk analysis built on 3 approaches,
 - ✓ Predictive process including:
 - A bio mathematical model (SAFE),
 - Previous experiences.
 - ✓ Proactive process including:
 - Flight Data Monitoring,
 - Crew Survey,
 - ✓ Reactive process including:
 - Fatigue report (REF),
 - Air Safety Report (ASR),
- A safety assurance process
- A promotion of FRMS process

In HOP! Airlines, crew schedule department is involved in the main steps of FRMS process.

To coordinate the fatigue management HOP! has created a functional group. This group is called **F-SAGE** (Fatigue Safety Action Group Expert).

The main functions of the F-SAGE are to:

- ✓ Develop and maintain the FRMS documentation,
- ✓ Manage the FRMS processes,
- ✓ Contribute to the FRMS safety assurance processes,
- ✓ Be responsible for the promotion processes.

The composition of the F-SAGE include Flight Safety management, Crew management and Crew Schedule Management and F-SAGE's meetings are held a minimum of twice a year.

Before validation, F-SAGE's decisions are proposed to the Safety Committee and to the accountable manager.

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Risk Analysis – Predictive process



Predictive process is based on the use of bio-mathematical model and previous experiences.

BIO-MATHEMATICAL MODEL (S.A.F.E)

Bio-mathematical models of humans fatigue provide a tool which incorporates scientific knowledge about fatigue into scheduling through predictions of fatigue risk levels and sleep opportunity.

The use of SAFE should respect several principles of operation:

- ✓ SAFE predicts a group average fatigue levels, and not the fatigue levels of individual crew members.
- ✓ The model prediction should not be used without reference to operational experience, when making decisions about schedule design.
- ✓ SAFE model, like all other existing models may not be the only way to make operational decisions on FRMS, and it **must be one of layers** of FRMS

How do we use SAFE?

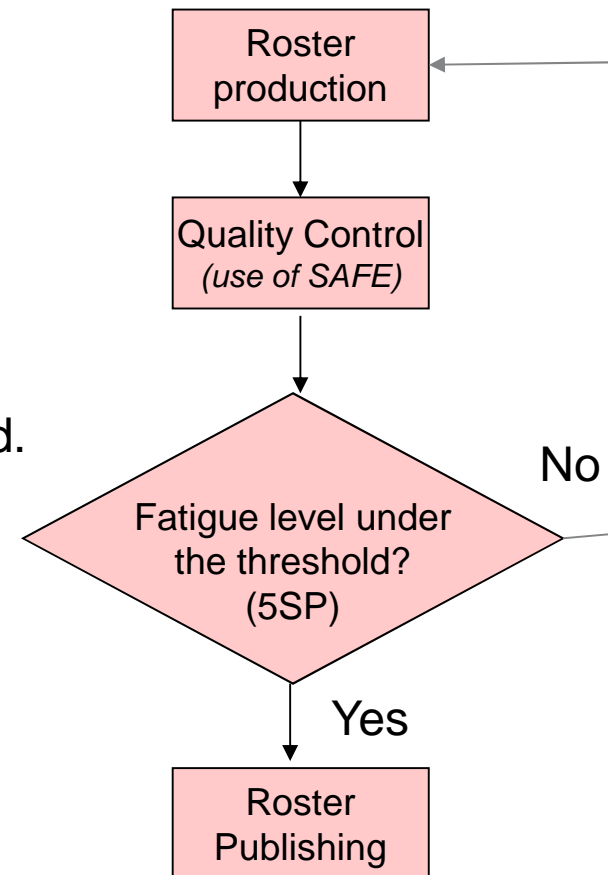
All fatigue levels of all rosters of crews members are evaluated each week, before publishing.

Fatigue level of each pairing, can be evaluated.

SAFE is used as a quality control before published.

When the fatigue level is between 4,5 and 5, rosters are analyzed by schedulers, and rosters can be modified before publishing.

If the fatigue level is above the threshold, the roster is modified before publishing.



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Risk Analysis – Predictive process

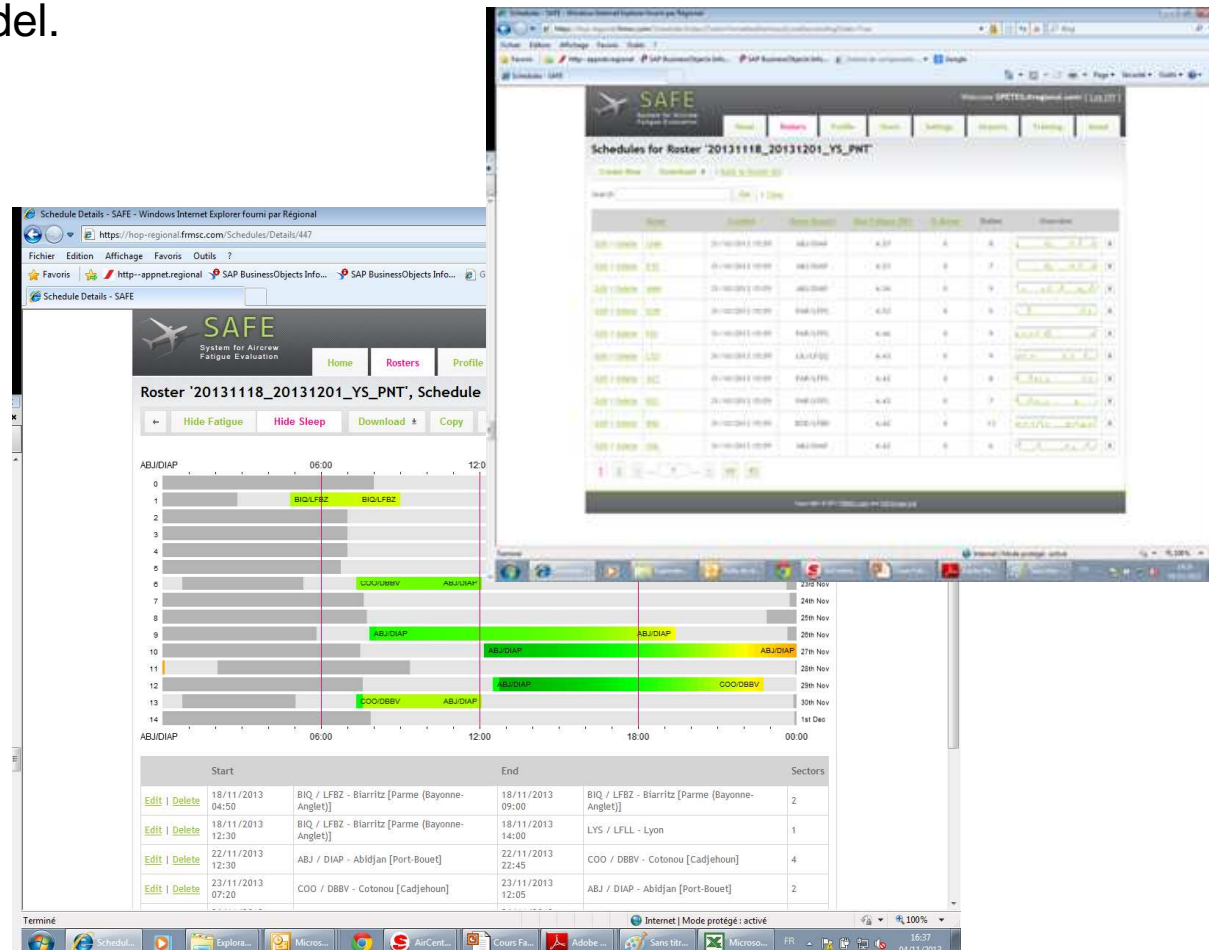
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How do we use SAFE?

Rosters data, like time of duty, duty hours, number of legs, time of rests, airports of duty start and end are extracted from our scheduling tool to an excel file and are downloaded in SAFE model.

The result is displayed in table, in which fatigue level can be classified.

A graphical display can also shows the results.



The scale used to evaluate the fatigue level is the Samn Perelli scale. This scale has 7 fatigue levels:

- 1 – *Fully alert, wide awake*
- 2 – *Very lively, responsive, but not at peak*
- 3 – *Okay, somewhat fresh*
- 4 – *A little tired, less than a fresh*
- 5 – *Moderately tired, let down*
- 6 – *Extremely tired, very difficult to concentrate*
- 7 – *Completed exhausted, unable to function effectively.*

The maximum level recommended by editor SAFE in terms of fatigue level is 5 SP.

However, taking into account our operational experience and our fatigue risk management experience, the fatigue level threshold could be modified.

SAFE can be also used by F-SAGE members to analyze some rosters in case of events.

PREVIOUS EXPERIENCES

Experiences of crew schedule management and schedulers are an important source of information to identify difficult pairings that may be associated with increased fatigue.

This operational experience is taken into account twice a year (before winter and summer season) during meetings with crew schedule management, crew management and crew unions.

During these meetings, call “Commission des Rotations” all “heavy pairings” are identified and decisions are taken such as:

- A modification of the pairing when it is possible,
- To plan this pairing with a Day Off before or after this pairing,
- To plan this heavy pairing with a light one,
- To avoid to plan this pairing twice a month for a crew member...

After this meeting, a minute meeting is send to schedulers and F-SAGE and decisions of the commission must be applied.

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Risk Analysis – Predictive process



Another way to take previous experience into account is to configure the Crew Schedule Optimizer.

Following parameters are taken into account and followed with indicators, such as:

- Balancing activity between crew members (such as Duty, Flight Duty, number of legs, Days On, Days Off),
- Number of consecutive days On,
- Number of consecutive early starts,
- Balancing of layovers,
- Number of vacations.

Activity's indicators have been built, and indicators are presented each month to the crew management.

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Risk Analysis – Predictive process

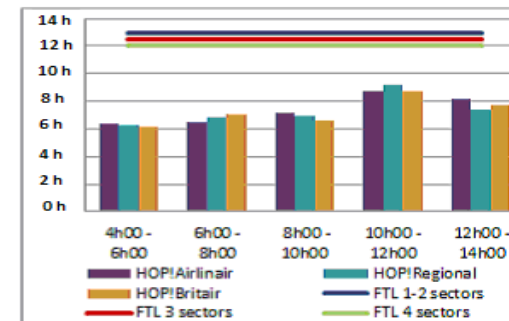
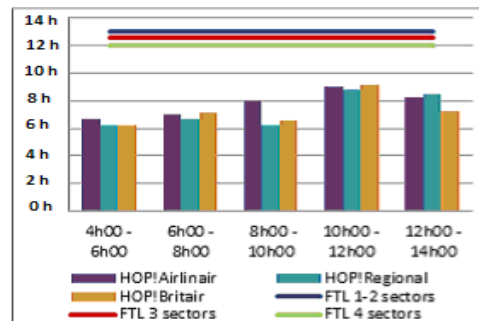


During monthly meeting between Crew
Schedule Management and Crew
Management, these indicators are presented.

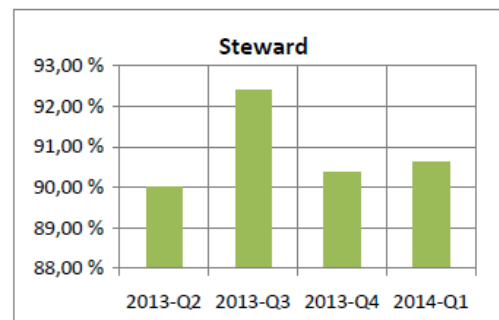
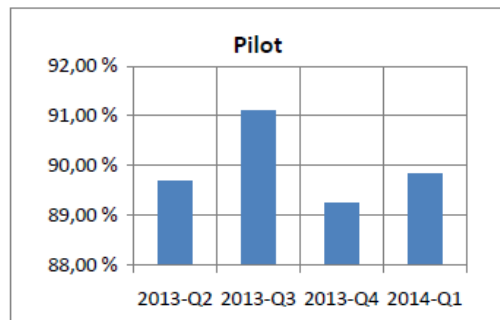
Payment indicator

| | UHVSup | EcartType |
|---------|----------|-----------|
| CDB EJ | 75:43:03 | 07:15:18 |
| OPL EJ | 73:27:34 | 07:51:09 |
| CDB ERJ | 50:06:32 | 08:32:15 |
| OPL ERJ | 58:00:00 | 07:31:09 |
| CDC | 73:42:02 | 07:17:53 |
| HST | 70:59:04 | 11:18:27 |

Distribution of the FDP average as a function of
the reporting time



Roster Stability



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Risk Analysis – Proactive process



In the FRMS, proactive hazard identification processes focus on monitoring fatigue levels in operations.

Because fatigue affects many skills and has multiple causes, there is no single measurement that gives a total picture of a crew member's current fatigue level.

For this reason, HOP! uses multiple sources of data for proactive hazard identification.

These sources are:

- ✓ Crew Survey,
- ✓ Flight Data Monitoring.
- ✓ Analysis of Planned versus Actual rosters,

CREW SURVEY

When the Fatigue Safety Action Group Expert (F-SAGE) identifies an increase in the number of fatigue events, where fatigue is reported by crew members as a contributory factor, F-SAGE can decide the implementation of fatigue survey on a particular rotation.

These surveys are of 2 types:

- Retrospective surveys that ask crew members about their sleep and fatigue in the past,
- Prospective surveys that ask crew members about their sleep and fatigue right now.

Since the implementation of FRMS, HOP! didn't use these kind of surveys.

HOP! has also an agreement with Air France to use their actigraphy's means to performed studies.

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Risk Analysis – Proactive process

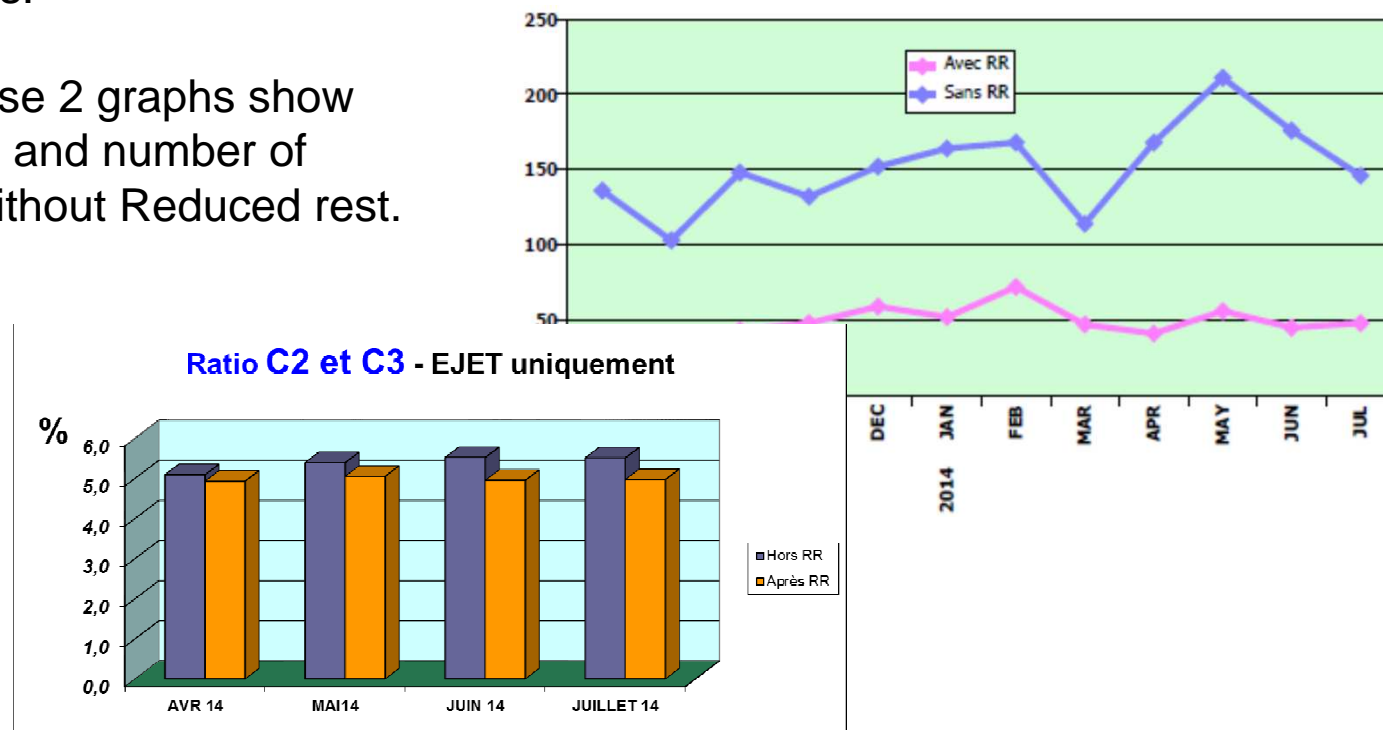


FLIGHT DATA MONITORING

Flight Data Monitoring provides one of the objective data that can be used to supplement the subjective data collected in fatigue reports and crew surveys.

These data are followed by Flight Safety Department and forwarded to the F-SAGE for trend analysis.

For example these 2 graphs show the trend of ratio and number of events with or without Reduced rest.



ANALYSIS OF PLANNED VERSUS ACTUAL ROSTERS

The reduction of fatigue hazard is taken into account by crew schedule department by using their previous experiences and SAFE.

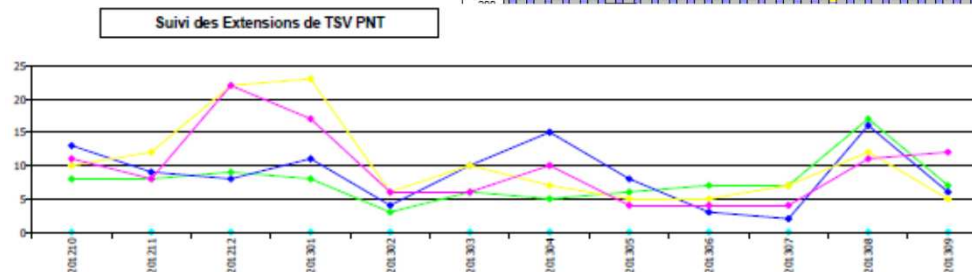
However Crew member fatigue is related to what is actually flown, not what is planned.

So, rosters analysis identify fatigue hazards of operational factors. This identification is done by crew schedule department with several indicators such as:

- Roster's stability,
- Number of Captain's discretion,
- Number of roster's changes,
- Number of FDP's extension.

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Trend of roster's Stability



In the FRMS, reactive processes are designed to identify the contribution of crew member fatigue to Safety reports and events.

HOP! had implemented a report system to identify fatigue hazards. There are 2 kinds of reports:

- Air Safety Report, in case of error,
- Fatigue Experience Report in case of high fatigue level.

Air Safety Report

ASR are used by crew member in case of event related to safety. Even if fatigue aspect is not clearly identified, the fatigue hazard can appear after analysis of FSAGE.

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Risk Analysis – Reactive process



Fatigue Experience Report (REF)

Crew members write a Fatigue Experience Report when they feel high levels of fatigue or effects of fatigue on performance.

Information are gathered after the event, and information are completed after a call between people involved and Safety Officer.

The target of this process is to:

- Determine mitigation strategies,
- Determine new hazards related to fatigue.

Ref: **Retour d'Expérience Fatigue** **HOP! REGIONAL**

*Merci de bien vouloir compléter ce formulaire en cas de rencontre d'un niveau de fatigue inhabituel.
Les rubriques en rouge sont à remplir obligatoirement.*

Identification

Nom Prénom ☐ CDB ☐ OFL ☐ CC ☐ PNC

Informations sur le vol

Type avion/Variante Date de l'événement / /

Immatriculation de l'avion F- Heure de l'événement (UTC)

N° commercial de vol Temps écoulé depuis le début d'activité heures min

Etape (de - NTH-4.10)

Niveau de fatigue ressenti (cochez au minimum une case)

☐ Parfaitement alerte, complètement éveillé

☐ Vif, réactif, mais pas au maximum

☐ Plutôt frais, assez en forme

☐ Légèrement fatigué, pas complètement frais

☐ Modérément fatigué, en baisse de régime

☐ Excessivement fatigué, beaucoup de mal à se concentrer

☐ Complètement épuisé, incapable de travailler efficacement

Votre état au moment de l'événement (cochez la case correspondante)

Causes pressenties (cochez au minimum une cause)

Planing

☐ Enchevêtrement d'activités/Rythme de travail

☐ Repos réduit

☐ Amplitude d'activité

☐ Début Temps Service Vol maximal

☐ Levées très consécutives

☐ Arrivée tardive

☐ Changement d'avion/d'équipage

☐ Bercin (temps d'attente)

☐ Répétitivité des étapes

☐ Mises en place

Personnel

☐ Fatigue avant le vol

☐ Transport domicile/travail

☐ Peur de ne pas se réveiller/Difficulté à s'endormir

☐ Autre

Exploitation

☐ Pannes et MEL

☐ Retard

☐ Passagers (conflits, particularités)

☐ Prévision temporelle

☐ Type d'avion et profil de vol

☐ Météo

☐ Avion brouillé

☐ Température (chaud/froid)

☐ Prévisions équipage

☐ Aléas logistiques

☐ Autre

Informations additionnelles

Depuis combien de temps êtes-vous éveillé au moment de l'événement ou du ressenti de fatigue? heures min

Durée de sieste durant les 24h avant l'événement ou ressenti? heures min

Durée de sommeil de la dernière nuit et des deux précédentes?

Nuit heures min

Nuit -1 heures min

Nuit -2 heures min

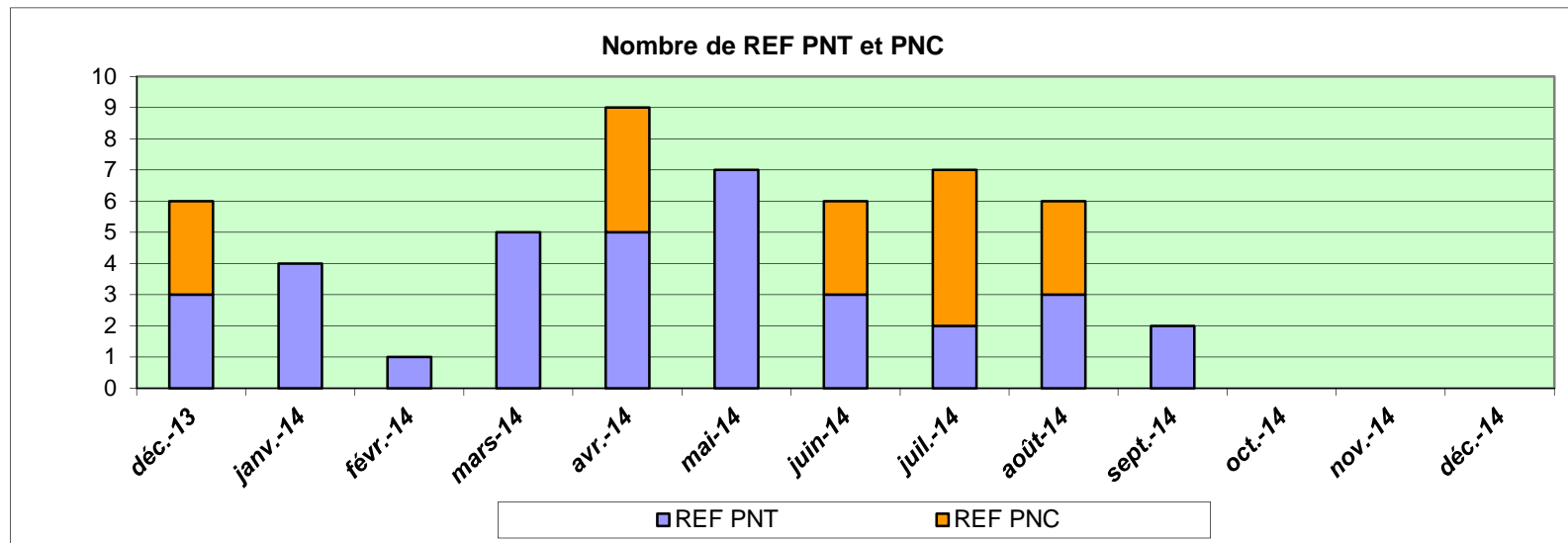
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Risk Analysis – Reactive process



During FSAGE meeting, summary report is analyzed and the following indicators are presented.

Trend and ratio are analyzed, and each event is linked to crew roster and to a leg.



FRMS promotion processes support the ongoing development of FRMS, the continuous improvement of its overall performance, and attainment of optimum safety level.

In this purpose, HOP! had developed a training course with the assistance of the “Centre du Sommeil et de la vigilance de l’Hôtel Dieu, Paris” run by the well-know Professor Leger.

Three learning modules have been developed according to the category of staff with an adapted content :

- ✓ F.S.A.G.E members, SMS managers, training managers and fatigue trainers : a in-depth training (7 hours) in order to develop in-house expertise in fatigue data collection and analysis,
- ✓ Crew members : a 3 hours session in order to provide not only the necessary fatigue knowledge but a tool box to manage fatigue,
- ✓ Crew Scheduling : a 3 hours session in order to develop the awareness of how scheduling and the management of scheduling affect sleep opportunities or the workload. An additional and specific SAFE training (1,5 hour) completes their knowledge requirements,
- ✓ Senior management : a continuous training during the implementation of the FRM in addition of FSAGE or crew scheduling training session.

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Promotion of FRMS process

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Since October 2013, all crew member of HOP!, all F-SAGE members, all crew scheduling, all senior management had followed these training courses.

Concerning crew members fatigue training course is followed during recurrent training.

Sommaire

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- 1 . Nouveautés réglementaires.
- 2 . Risque fatigue ?
- 3 . SMS et risque fatigue.
- 4 . Responsabilité des membres d'équipage dans la gestion des repos et de l'hygiène de vie pour assurer leur service.



Ecole du Sommeil
Centre du Sommeil

- 5 . L'horloge biologique et les rythmes circadiens.
- 6 . La fatigue et effets sur les performances.
- 7 . Le sommeil.
- 8 . Familiarisation avec les troubles du sommeil et leur traitements possibles.
- 9 . Gestion de la fatigue, contre mesures.



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