



# FATIGUE RISK MANAGEMENT SYSTEM

Presented by  
*Gianluigi Guanzioli*  
*VP Safety*



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## AZ FRMS BACKGROUND

ENAC  
Protocollo del 30/12/2009  
0009342/OOR

5- l'attività di volo, durante il periodo di sperimentazione, dovrà essere monitorata applicando le tecniche di "FRMS" oltre che dalla Direzione Operazioni Volo e Sicurezza e Qualità, anche dall'Ente Medicina Alitalia;

## **FATIGUE**

A physiological state of reduced mental or physical performance capability resulting from:

- Sleep loss
- Extended wakefulness
- Circadian phase
- Workload (mental and/or physical activity)

that can impair a crew member's alertness and ability to safely operate an aircraft to perform safety related duties

**FATIGUE IS A SAFETY HAZARD**

**IT MUST BE ADDRESSED AND CONTROLLED**



Since ever crewmember fatigue has been managed through **PRESCRIBED** limits on maximum Flight and Duty Times, based on a historical understanding of fatigue through simple work and rest period relationships

**BEING INSIDE THE LIMIT IS SAFE**

**BEING OUTSIDE THE LIMITS IS UNSAFE**

New knowledge related to the effects of sleep and circadian rhythms provides an additional dimension to the management of fatigue risks



## FATIGUE RISK MANAGEMENT SYSTEM

A **data-driven** means of continuously monitoring and managing fatigue-related safety risks, based upon scientific principles and knowledge as well as operational experience that aims to ensure relevant personnel are performing adequate levels of alertness



**FRMS applies SMS principles and processes to manage specific risks associated with crewmember fatigue**



# FRMS PILLARS

## Policy & Documentation

### Policy

- ✓ States FRM objectives
- ✓ Declares management commitment
- ✓ Identifies lines of accountability
- ✓ Identify FRM elements

### Documentation

- ✓ Policy and objectives
- ✓ Processes and procedures
- ✓ Accountabilities
- ✓ Mechanism for involvement of all stakeholders
- ✓ FRM training records
- ✓ Output: recommendations & Actions

## Safety Assurance

- ✓ Monitoring FRM performance
- ✓ Managing changes
- ✓ Continuous improvement

## Risk Management

- ✓ Identification of fatigue hazards
- ✓ Risk assessment
- ✓ Risk mitigation strategies

## Promotion

- ✓ Training
- ✓ Communication


# FRMS IMPLEMENTATION

- ✓ On JUNE 2014 SRB DECISION FOR FRMS
- ✓ FRMS INTRODUCED TO PILOTS DURING RT 2014-15
  - Starting Communication and Training as early as possible
  - Brief presentation describing FRMS scope, principles and tools
- ✓ FATIGUE REPORTING
  - Reporting Primary tool for Hazard Identification
  - Fatigue reporting already possible by using Air Safety Report
  - Developed an ad-hoc Fatigue Report for structured reporting
  - Reports electronically managed
- ✓ FATIGUE SAG SETTING-UP
  - Composition
  - Tasks





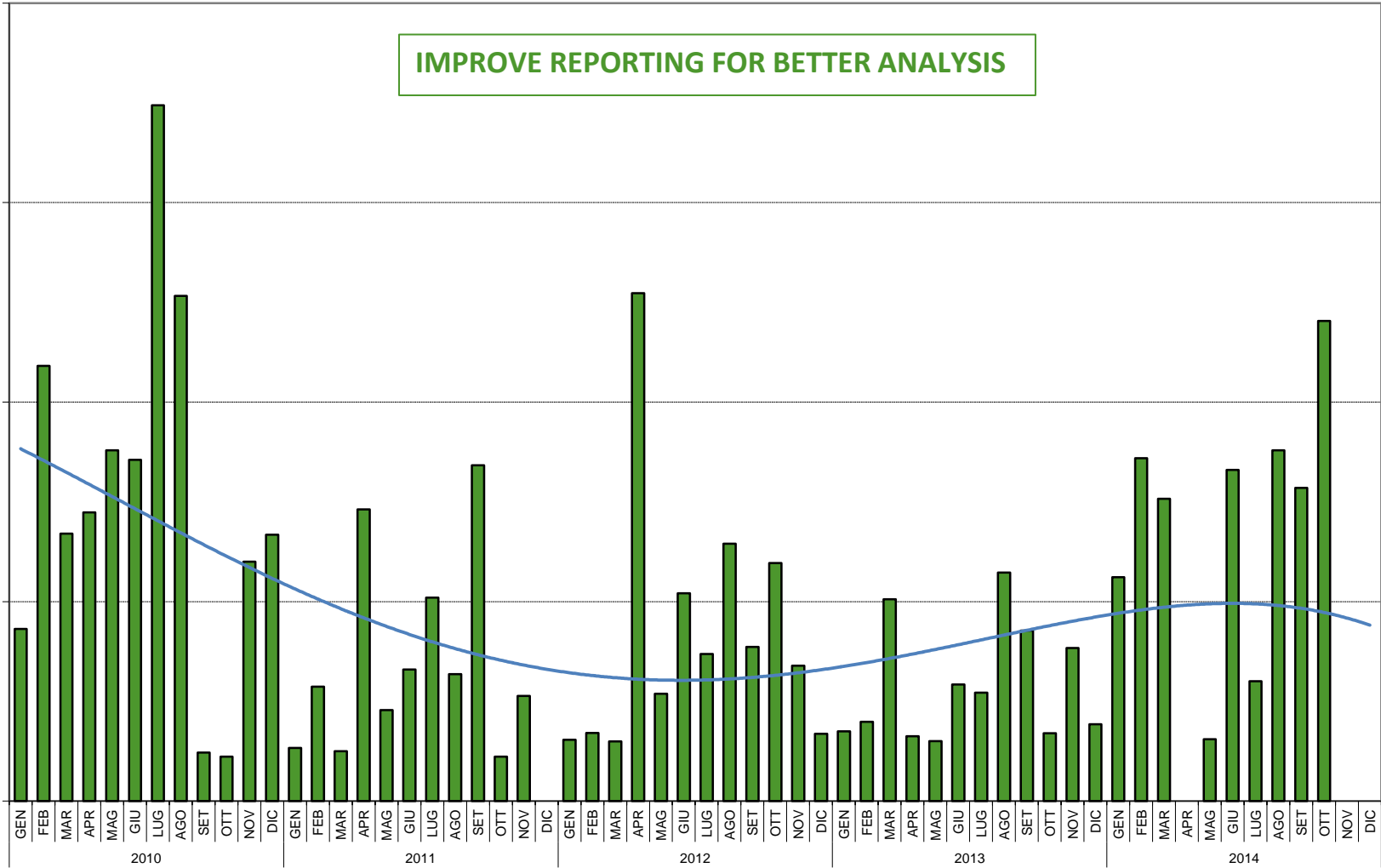
# FRMS IMPLEMENTATION – FATIGUE REPORTING

		<b>FATIGUE REPORT FORM</b>	
ALL INFORMATION PROVIDED IS STRICTLY CONFIDENTIAL AND MANAGED WITHIN SAFETY DEPARTMENT			
NAME:	RANK:	CREW ID:	TODAY'S DATE:
THIS FATIGUE REPORT FORM IS BEING COMPLETED IN ASSOCIATION WITH: (TICK ONE)			
<input type="checkbox"/> An ASR	<input type="checkbox"/> A CSR	<input type="checkbox"/> A general concern regarding fatigue	
When did the event occur?	Date (dd/mm/yy): __/__/__	Time (specify Local LT or UTC): __:__:__	How long had you been on duty? (hh:mm): __:__:__
What where you doing at the time of the event?	<input type="checkbox"/> In flight	<input type="checkbox"/> Driving to work	<input type="checkbox"/> Driving home
<input type="checkbox"/> Positioning	<input type="checkbox"/> Other		
If relevant, on what flight did the event occur?	Flight number:	Route:	Event sector:
Aircraft type:			
Duty details:	Departure time (LT) <input type="checkbox"/> Early (< 7:00AM) <input type="checkbox"/> Late (> 8:00PM) (tick one)	Duty day: 1, 2, 3, 4, 5, 6 (circle day of event)	Rostered start time (local/UTC): __:__:__
			Rostered finish time (local/UTC): __:__:__
		Actual start time (local/UTC): __:__:__	Actual finish time (local/UTC): __:__:__
		Duration of commute To & From duty: From: (hh:mm): To: (hh:mm):	
Rostered duty days: ____	Days of rest before duty: ____	Days of rest after duty: ____	Days of rest last 30 days: ____
Sectors per day: day1__ day2__ day3__ day4__ day5__ day6__	Max transit time (only if >2hrs): day1__ day2__ day3__ day4__ day5__ day6__	If you changed a/c, how many times? day1__ day2__ day3__ day4__ day5__ day6__	
Congested radio/poor English (Y/N) day1__ day2__ day3__ day4__ day5__ day6__	Poor ground handling (Y/N) day1__ day2__ day3__ day4__ day5__ day6__		
No. of Low Visibility approach performed (CATII/CATIII): day1__ day2__ day3__ day4__ day5__ day6__	MEL (only if requesting crew op. procedures) (Y/N): day1__ day2__ day3__ day4__ day5__ day6__		
Other specific operations / events contributing to fatigue (e.g. De-icing Anti-icing Procedures; medical emergency etc.):			
Tick all factors that you feel contributed to the event / your general concern	<input type="checkbox"/> Illness/incapacitation <input type="checkbox"/> Human fatigue/alertness <input type="checkbox"/> Long-term fatigue <input type="checkbox"/> Circadian dysrhythmia (jet lag) <input type="checkbox"/> Rest/duty time <input type="checkbox"/> Long duty day (>12hrs) <input type="checkbox"/> Sleep deficit <input type="checkbox"/> Roster disruption <input type="checkbox"/> Early to late transition <input type="checkbox"/> Early start time <input type="checkbox"/> Late finish time <input type="checkbox"/> Delay(s) <input type="checkbox"/> Positioning <input type="checkbox"/> Sleep disruption <input type="checkbox"/> Hotel rest <input type="checkbox"/> Home rest <input type="checkbox"/> Personal stress factors <input type="checkbox"/> Home issues <input type="checkbox"/> Don't know		Use this space to provide further detail or to record factors not listed:

If you are reporting a specific event rather than a general concern please tick all physical and cognitive signs of fatigue that were apparent in the <u>2 hours</u> leading up to the event.	FATIGUE - PHYSICAL SIGNS		COGNITIVE SIGNS				
	<input type="checkbox"/> Fidgeting <input type="checkbox"/> Fast talking <input type="checkbox"/> Rubbing eyes <input type="checkbox"/> Yawning <input type="checkbox"/> Frequent blinking <input type="checkbox"/> Staring blankly <input type="checkbox"/> Long blinks <input type="checkbox"/> Difficulty keeping eyes open <input type="checkbox"/> Head nodding <input type="checkbox"/> NO PHYSICAL SIGNS WERE NOTED <input type="checkbox"/> OTHER: _____		<input type="checkbox"/> Action or lack of action ○ Action-slips ○ Action-lapses/omissions <input type="checkbox"/> Impaired memory <input type="checkbox"/> Action-information processing/decision making ) ○ Impaired Problem solving <input type="checkbox"/> Impaired attention <input type="checkbox"/> Personality factors ○ Negative mood ○ Reduced communication <input type="checkbox"/> Increased risk taking (103090200) <input type="checkbox"/> Impaired situational awareness (103080600) <input type="checkbox"/> NO COGNITIVE SIGNS WERE NOTED <input type="checkbox"/> OTHER: _____				
How alert did you feel immediately prior to the event (tick one):	<input type="checkbox"/> 1 Fully alert, wide awake	<input type="checkbox"/> 2 Very lively, somewhat responsive, but not at peak	<input type="checkbox"/> 3 OK, somewhat fresh	<input type="checkbox"/> 4 A little tired, less than fresh	<input type="checkbox"/> 5 Moderately tired, let down	<input type="checkbox"/> 6 Extremely tired, very difficult to concentrate	<input type="checkbox"/> 7 Completely exhausted
Did you apply napping during flight?	<input type="checkbox"/> Yes		<input type="checkbox"/> No				
NOTE: IF YOU WISH TO RECORD ADDITIONAL INFORMATION NOT COVERED BY THIS FORM, INCLUDING ANY SUGGESTIONS FOR CORRECTIVE ACTIONS, PLEASE USE THE SPACE BELOW OR ATTACH ADDITIONAL SHEETS.							
(Space for additional information)							
TICK HERE IF ATTACHING ADDITIONAL SHEETS: <input type="checkbox"/> NUMBER OF SHEETS ATTACHED _____							
Sign: _____							
FATIGUE REPORTS SHOULD BE FILLED-IN AND SENT ELECTRONICALLY. PAPER FORMS SHALL BE CONSIDERED AS A BACK-UP PROCEDURE IN CASE OF MALFUNCTION OF THE ELECTRONIC REPORTING SYSTEM.							
<b>FILING INSTRUCTIONS</b> FCO/LIN → CREW BRIEFING CENTER ALL OTHER STATIONS → KK CBC or KK → eMail to: <a href="mailto:sicurezza.volo@alitalia.it">sicurezza.volo@alitalia.it</a> OR Fax to: +39 (06) 6563 8316 or +39 (06) 6563 8354 Original form to: Alitalia SAFETY (SFT/FCO) Aeroporto Leonardo Da Vinci 00054 – Fiumicino (RM)							

# FRMS IMPLEMENTATION – FATIGUE REPORTING

IMPROVE REPORTING FOR BETTER ANALYSIS



# FRMS IMPLEMENTATION – SAG SETTING-UP

## F-SAG COMPOSITION

- ✓ Flight Operations
- ✓ Planning & Crew Rostering
- ✓ Safety
- ✓ Compliance
- ✓ Medicine

## F-SAG TASKS

- ✓ Monitor FRM Performance
- ✓ Identify Hazards and assess Risks
- ✓ Propose Mitigation Strategies
- ✓ Verify effectiveness of actions taken



# FRMS IMPLEMENTATION

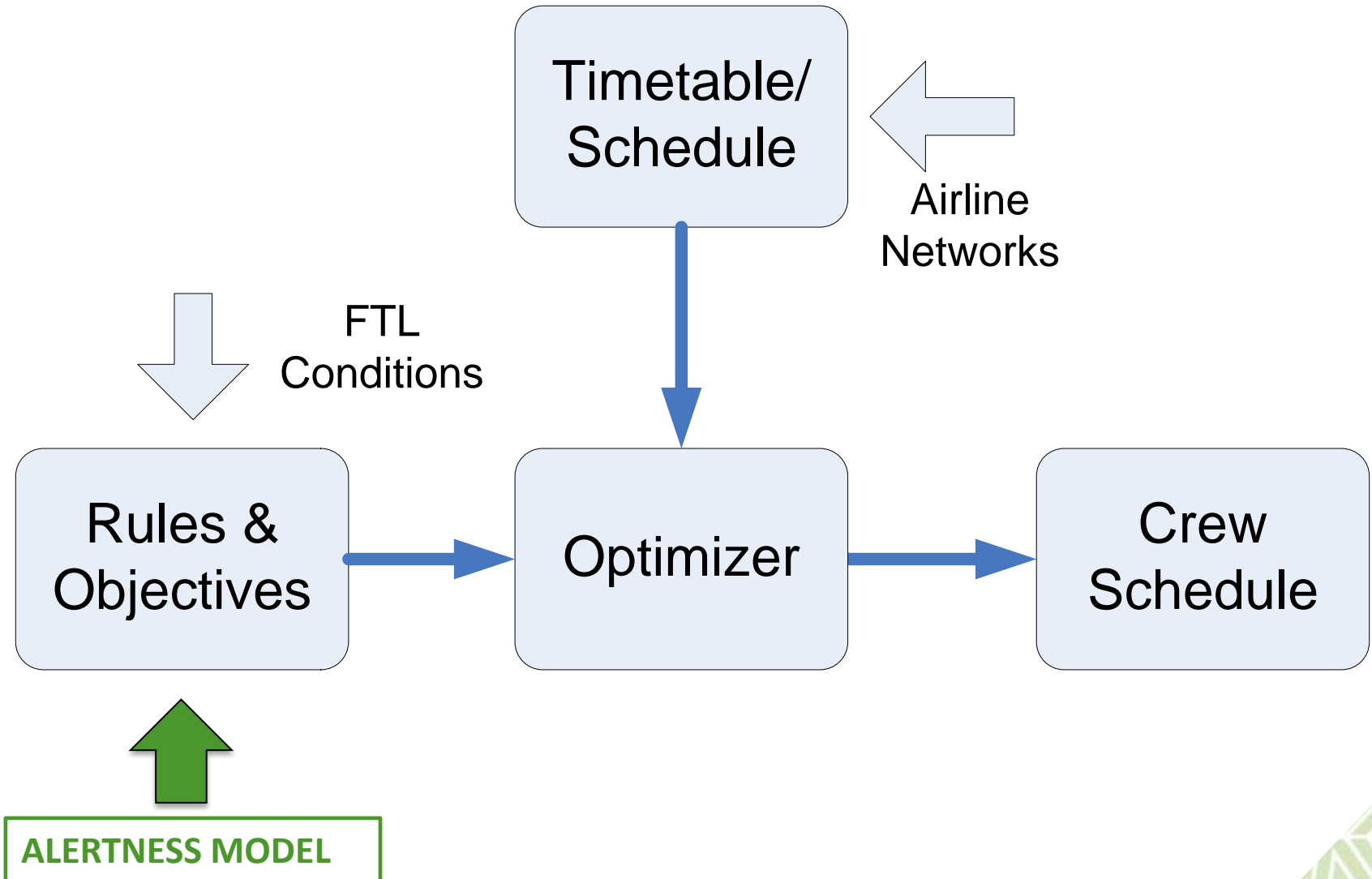
## INTRODUCTION OF ALERTNESS MODELING

- ✓ Alertness Models are mathematical functions which predict alertness and cognitive performance based on:
  - Sleep / wake history  
Can be estimated from planned work schedule
  - Circadian Phase / Time of the Day  
Can be estimated from local time and time zone shift
- ✓ Alertness is predicted using scales ( e.g. BAM uses a 0-10.000 scale, with 0 being the least alert, and 10.000 being most alert)
- ✓ Choice of the Alertness Model

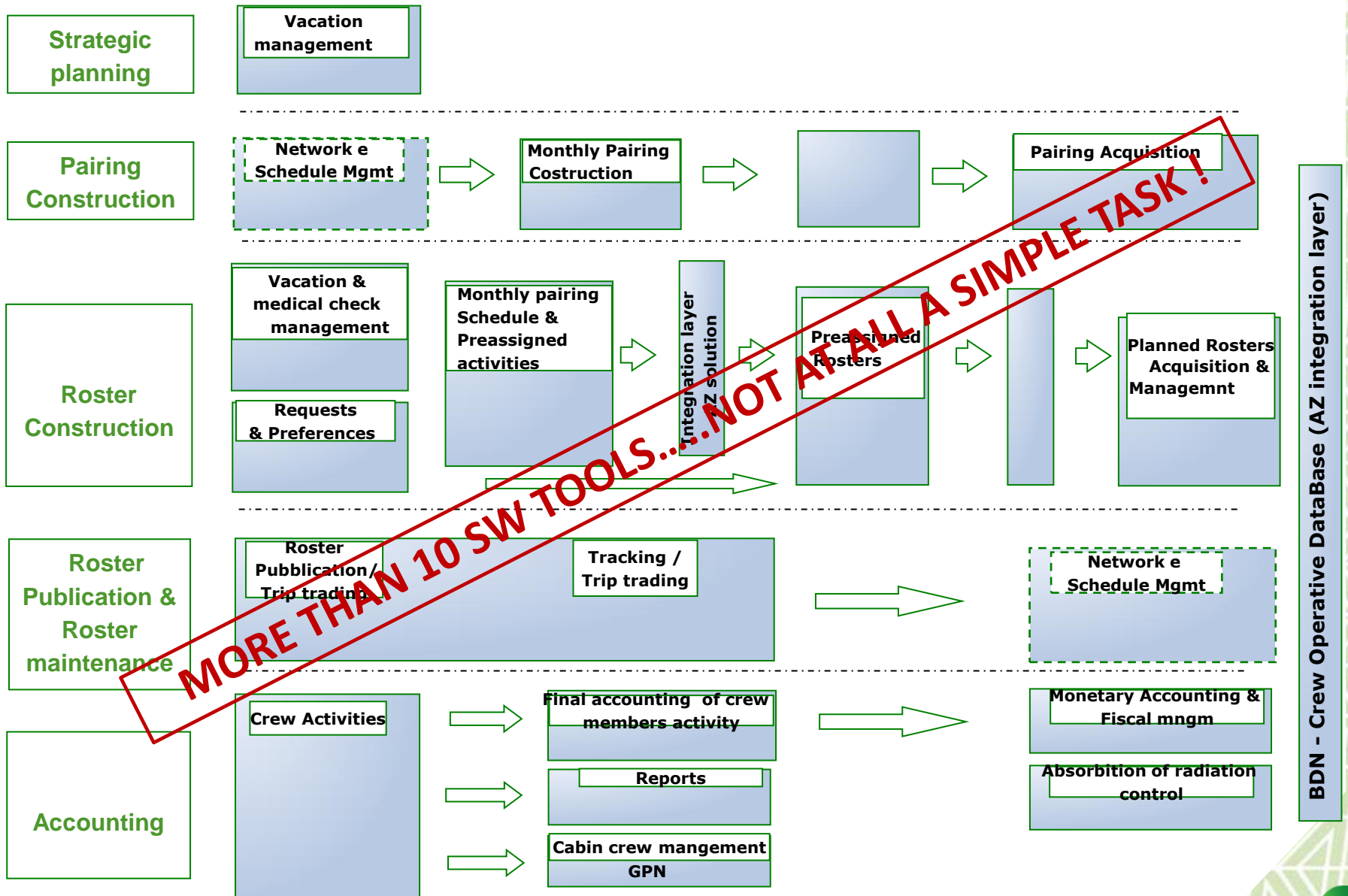


# FRMS IMPLEMENTATION

## INTRODUCTION OF ALERTNESS MODELING



# FRMS - INTRODUCTION OF ALERTNESS MODELING



## CONCLUSION

- ✓ FRM is a step forward for a more accurate and efficient control of fatigue hazard
- ✓ FRM introduction easier in a SMS environment
- ✓ FRM takes time to be developed



THANK YOU  
FOR YOUR ATTENTION

