



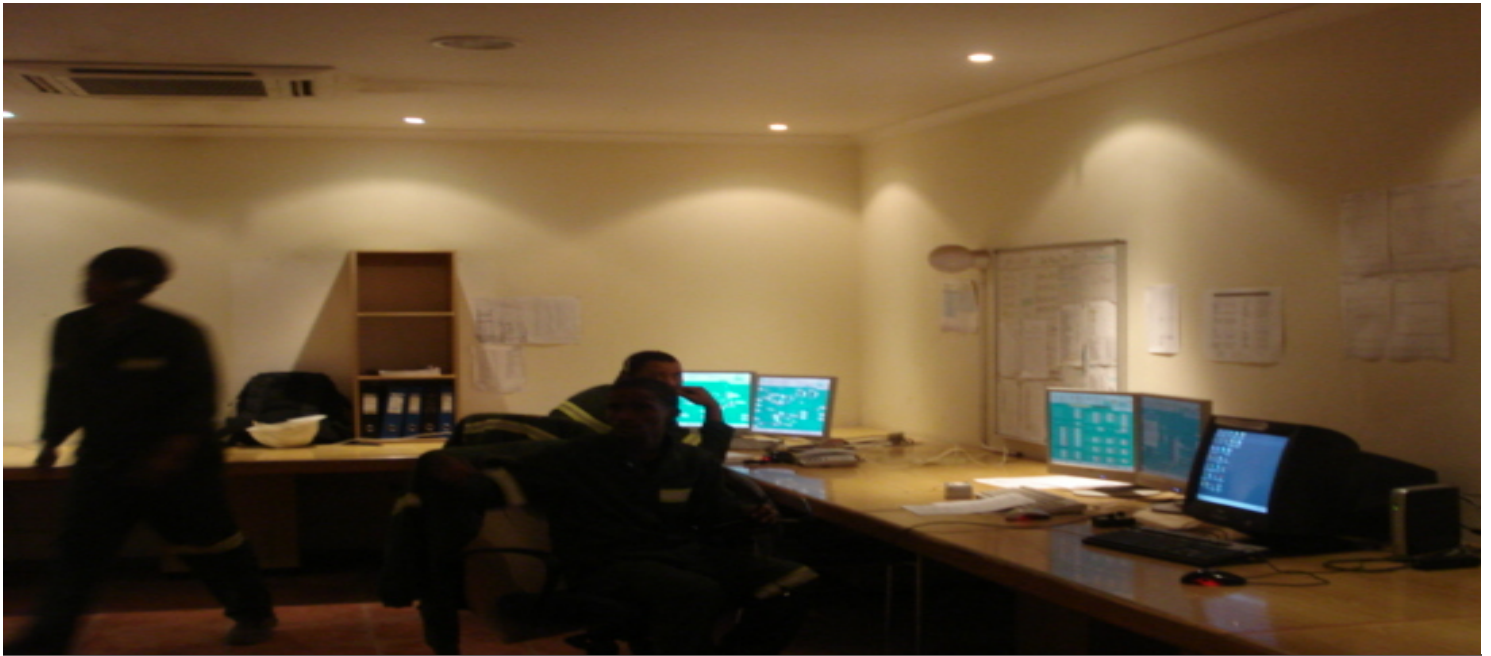
# Fatigue Risk Assessment (FRA) Process

Applying Alertness Science:  
Identifying Fatigue  
Causes and Costs



Fatigue Management Solutions Ltd. (FMS) Calgary, Canada  
[www.fatiguesolutions.ca](http://www.fatiguesolutions.ca)





Many fatigue risk factors, independently, and in combination, influence and impair employee capability



FMS' Fatigue Risk Assessment (FRA) process is designed to:

- ❖ Identify site-specific fatigue risk exposure (causes and costs)
- ❖ Provide an empirical basis for understanding fatigue risks to:
  - Direct resources targeting fatigue risk priorities and,
  - Ensure installation of effective fatigue management (FM) control measures
- **ALL TO:** Enhance health and safety, performance

James McColgan,  
 Managing Director FMS  
 delivers FRAs covering all  
 elements of organisations to  
 identify:

- Site-specific fatigue risk exposure, causes & costs



## FMS' FRA covers:

- Existing FM policies and practices
- Accident investigation process and how/if findings interpret for fatigue role
- Rosters - applying FMS software to quantify fatigue risk levels
- Work environment and conditions
- Impact of shift work on lifestyle (work social/balance)
- Role of shift work lifestyle in 'at-work' fatigue risk and on health/wellness

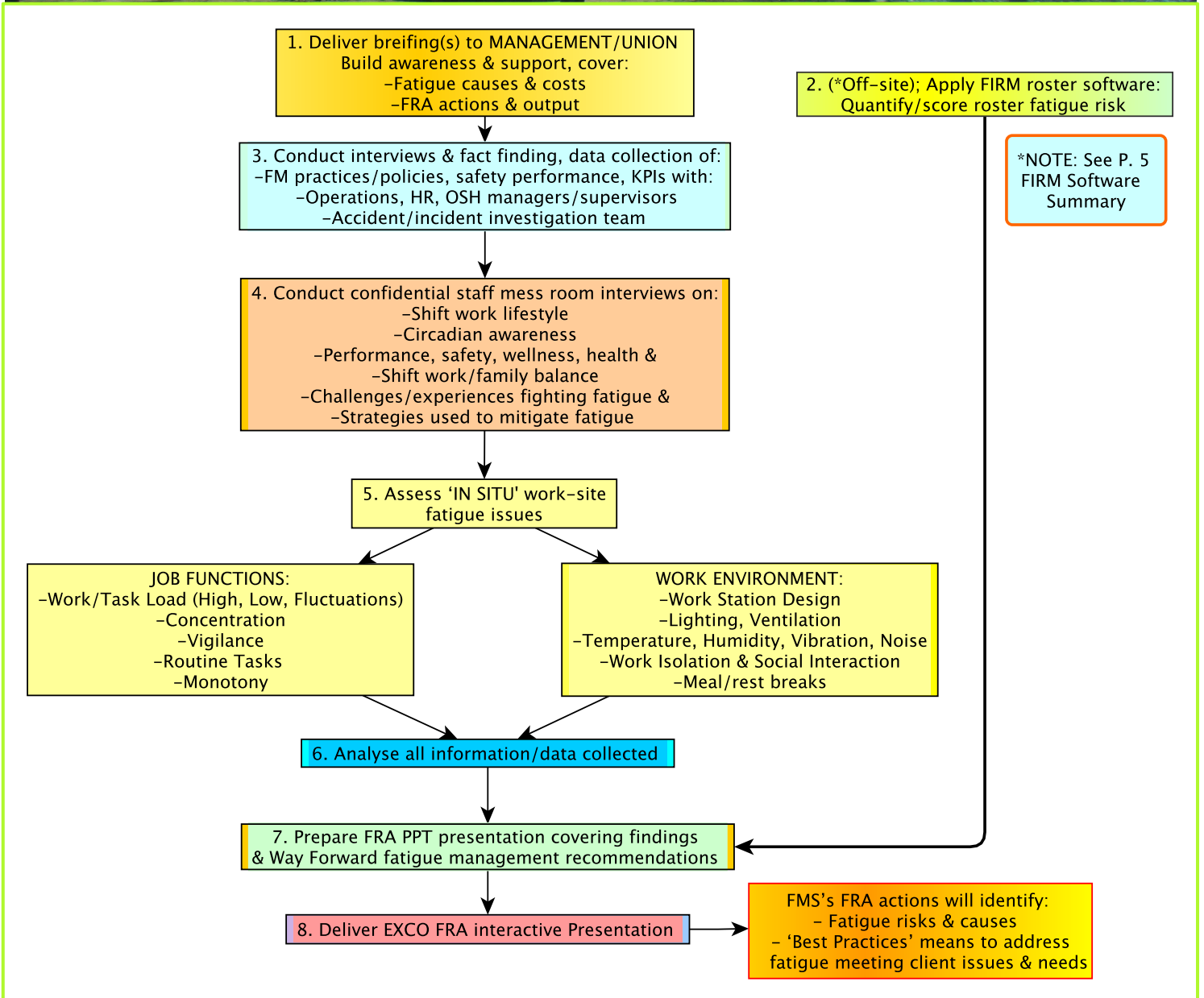
## FRA findings confirm:

- Capacity & gaps in FM practices & policies
- Causes & costs of fatigue & impact on: Safety, health, performance, reputation & bottom line
- Business/safety case for adopting practical fatigue mitigation measures and;
  - Delivers recommendations on effective control measures to address fatigue risk

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\* For more information on FMS' FRA contact James McColgan, FMS Managing Director  
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# Applying FMS's Fatigue Risk index (FIRM) to build stakeholder consensus about roster fatigue

**FIRM** is a unique tool to assess roster fatigue & design superior bio-rosters

**FMS' software FIRM:**

Quantifies roster fatigue of any roster e.g. 12 hour roster to right, from Low to Severe (+10 to -10) and;

Generates Risk Index Measurement of roster & colour codes fatigue from Low (green) to High/Severe (red to purple)

Produces fatigue scores. In this case, FIRM shows workers exposed to Significant to High risk over 36% of their shift cycle.

Delivers objective evidence-based confirmation for stakeholders of real roster fatigue risk

Creates basis for Fatigue Management Union/Company Partnership to implement superior bio-roster(s) reflecting human circadian tolerances and rest needs.

Example of 28 Day Cycle: showing shift patterns (work days rest days)

**5-2, 1-2, 4-5, 5-4 (12Hr)**

## 4 Crew Rotating 12 Hour Schedule

WEEKS/CREWS	MON	TUE	WED	THU	FRI	SAT	SUN	WEEKS/CREWS
1	D	D	D	N	N			1
2	N			D	D	N	N	2
3					D	D	TR	3
4	N	N						4

N = The Night you actually come into work

### LEGEND OF SHIFTS

D<sub>12</sub> = 6:30 18:30  
 N<sub>12</sub> = 18:30 6:30

**FATIGUE MANAGEMENT SOLUTIONS**

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## Risk Index Measurement - 4-5, 5-4, 5-2, 1-2 (12Hr)

Details:	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Week
Time:	7:00-19:00; D12	7:00-19:00; D12	19:00-7:00; N12	19:00-7:00; N12	OFF	OFF	OFF	1
RIM	2	2	-1	-2	1	2	4	RIM
Time:	OFF	OFF	7:00-19:00; D12	7:00-19:00; D12	6:30-6:30; TR12	19:00-7:00; N12	19:00-7:00; N12	2
RIM	6	8	2	2	2	-1	-3	RIM
Time:	OFF	OFF	OFF	OFF	7:00-19:00; D12	7:00-19:00; D12	7:00-19:00; D12	3
RIM	0	2	4	6	2	2	2	RIM
Time:	19:00-7:00; N12	19:00-7:00; N12	OFF	OFF	19:00-7:00; N12	OFF	OFF	4
RIM	-1	-3	1	5	-1	4	6	RIM
Time:	7:00-19:00; D12	7:00-19:00; D12	19:00-7:00; N12	19:00-7:00; N12	OFF	OFF	OFF	5
RIM	2	2	-1	-2	1	2	4	RIM
Time:	OFF	OFF	7:00-19:00; D12	7:00-19:00; D12	6:30-6:30; TR12	19:00-7:00; N12	19:00-7:00; N12	6
RIM	6	8	2	2	2	-1	-3	RIM
Time:	OFF	OFF	OFF	OFF	7:00-19:00; D12	7:00-19:00; D12	7:00-19:00; D12	7
RIM	0	2	4	6	2	2	2	RIM
Time:	19:00-7:00; N12	19:00-7:00; N12	OFF	OFF	19:00-7:00; N12	OFF	OFF	8
RIM	-1	-3	1	5	-1	4	6	RIM

## Current Mine Operations Roster

### Risk Index Legend

5 to 10	Low	Green	10	18%
2 to 4	Guarded	Yellow	26	46%
-1 to 1	Significant	Orange	14	25%
-4 to -2	High	Red	6	11%
-10 to -5	Severe	Purple	0	0%

**AVG. RISK/DAY = 1.89**

**36% in Significant - High Risk**

INDICATIVE TIMELINE FRA ACTIONS	WEEK 1	WEEK 2	WEEK 3	WEEK 4
<b>1. Deliver</b> kick-off orientation briefing/Q&A on: FRA process, fatigue causes and costs to: Management & Unions (joint or separate)	==			
<b>2. Apply</b> FIRM software roster to quantify/score roster fatigue risk	—			
<b>3. Conduct</b> interviews & fact finding, data collection of practices policies, safety performance, KPIs with: Operations, HR, OSH managers/supervisors accident investigation team	—			
<b>4. Administer</b> confidential staff mess room interviews on: Performance, safety, wellness, health & work/family balance, challenges/experiences fighting fatigue & strategies used to mitigate fatigue		—		
<b>5. Conduct</b> 'IN SITU' work-site observations, assess work tasks/load conditions, environment on fatigue risk			—	
<b>6. Analyze</b> all information/data collected			—	
<b>7. Prepare</b> FRA PPT presentation covering findings & way forward recommendations				—
<b>8. Deliver</b> EXCO FRA interactive Presentation				—

KEY:

On –site 

Off- Site 

James McColgan,  
Managing Director FMS  
Conducts 1<sup>st</sup> hand observations of  
client's site to ensure his FRAs  
deliver:

- Assessment of real fatigue risk
- Empirical business basis for understanding fatigue and,
- Solutions for effective control measures to address fatigue



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## Basis And Output Of FMS Services

- FMS is committed to:
- Applying leading alertness science to help companies identify & manage causes & costs of fatigue and,
- Workers & families succeed in shift work while improving wellness and quality of life
- Promoting proactive fatigue management as safety goal & creating culture where fatigue is identified as an unacceptable safety risk that:
  - - Recognises limits of human performance & link between alertness, safety, health & quality of life, &;
  - - Acknowledges working fatigued is as unacceptable as working under the influence of drugs or alcohol.

