InterDynamics

Navigating complexity. Delivering clarity.

Establishing Fatigue Tolerance Levels

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1. Establishing a Fatigue Tolerance Level

Biomathematical models do not make decisions on which work schedules are most appropriate in specific workplaces. What the models do, however, is provide information that can be useful when decisions about fatigue management need to be made. Tracking FAID Score & KSS results in relation to incident frequency, absenteeism levels, employee sick days or other organisationally meaningful data would allow a clearer illustration of the relationship between hours of work and its related costs.

Hours of work-related fatigue exposure can be limited by allocating work hours within a tolerance level or benchmark score.

FAID Quantum provides the facility for the user to set a **FAID Score Tolerance Level (FTL) and KSS Tolerance Level (KTL)**. Desirable compliance percentages can also be set. FAID Quantum provides reports specific to these settings.

Different Tolerance Levels may be set for specific tasks or roles. A lower Tolerance Level may be set for a higher risk task or role, and a higher Tolerance Level may be set for a lower risk task or role. For a specific task or role, one Tolerance Level may be used for planned hours of work, with the option of reviewing actual hours against a higher Tolerance Level, acknowledging that variances to the plan may occur on day of operations.

The list below represents an example of a combination of hours of work rules that could fit within an organisation's FRMS guidelines, utilising FAID Quantum software as a key component in the development and audit of fatigue risks associated with hours of work:

- A Tolerance Level of ***x*** (or multiple Tolerance Levels for tasks of various risks)
- Monthly, or roster cycle period compliance to Tolerance Level of all shifts for each individual to be no less than ***y***%
- Individual shifts should not exceed ***z*** points above the Tolerance Level
- Varying levels of actions/controls to be applied as exposures approach/exceed Tolerance Level
- Potential for differing values of ***x***, ***y***, and ***z*** for planned and actual hours.

1.1. Fatigue Hazard Analysis

Tolerance Levels and target compliance percentages are usually determined by an organisation after carrying out a Fatigue Hazard Analysis (**FHA**) risk assessment for a specific role[1]. That is, a risk assessment, which reviews the hazards of a role when fatigue is present. The risk assessment would consider (among other things) the current hours of work fatigue exposure analysed using FAID Quantum.

For more on Fatigue Hazard Analysis, see Section 5.

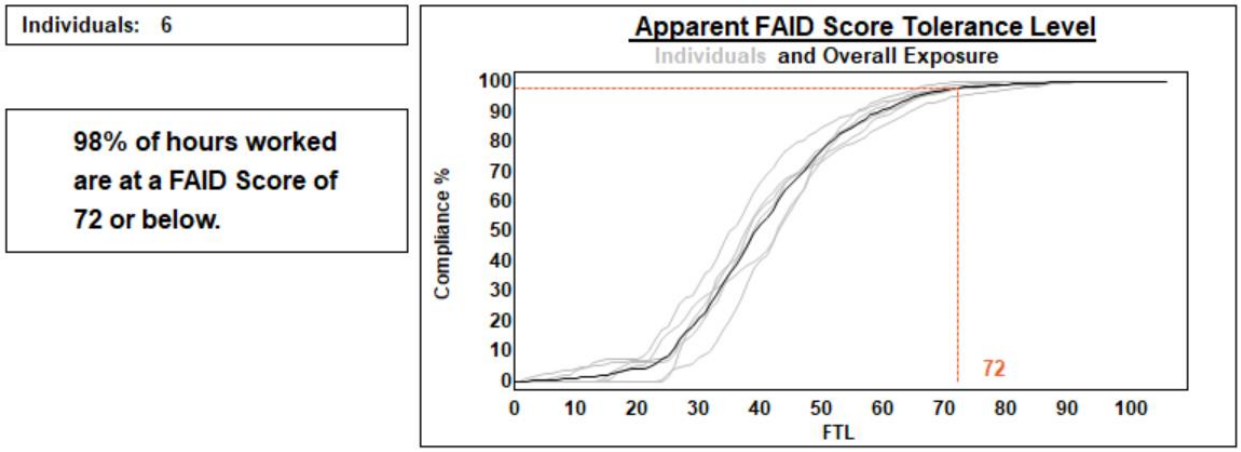
1InterDynamics' risk assessment methodology founded on Zurich's Hazard Analysis methodology aligned with AS/NZS ISO 31000:2009.

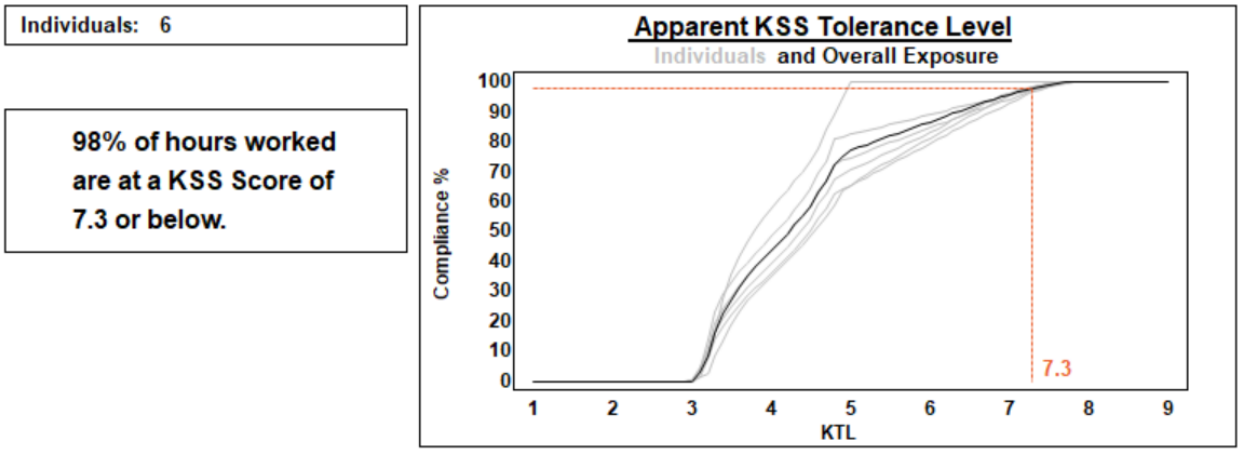
1.2. Using Current Hours of Work Exposure

The FHA risk assessment would consider the current hours of work fatigue exposure, which can be analysed using FAID Quantum.

The Apparent Tolerance Level reports (For KSS & FAID Score) provide an indication of the current hours of work fatigue exposure, most appropriately reflected when at least 6 to 12 months of the most recent actual hours of work data is analysed. It is often helpful for an organisation to take into consideration its current Apparent Tolerance Level (current hours of work fatigue exposure) in setting a Fatigue Tolerance Level.

The below **Apparent Fatigue Tolerance Level** reports from FAID Quantum show the current hours of work fatigue exposure of an organisation being at an Apparent FTL of 72 and Apparent KTL of 7.3.





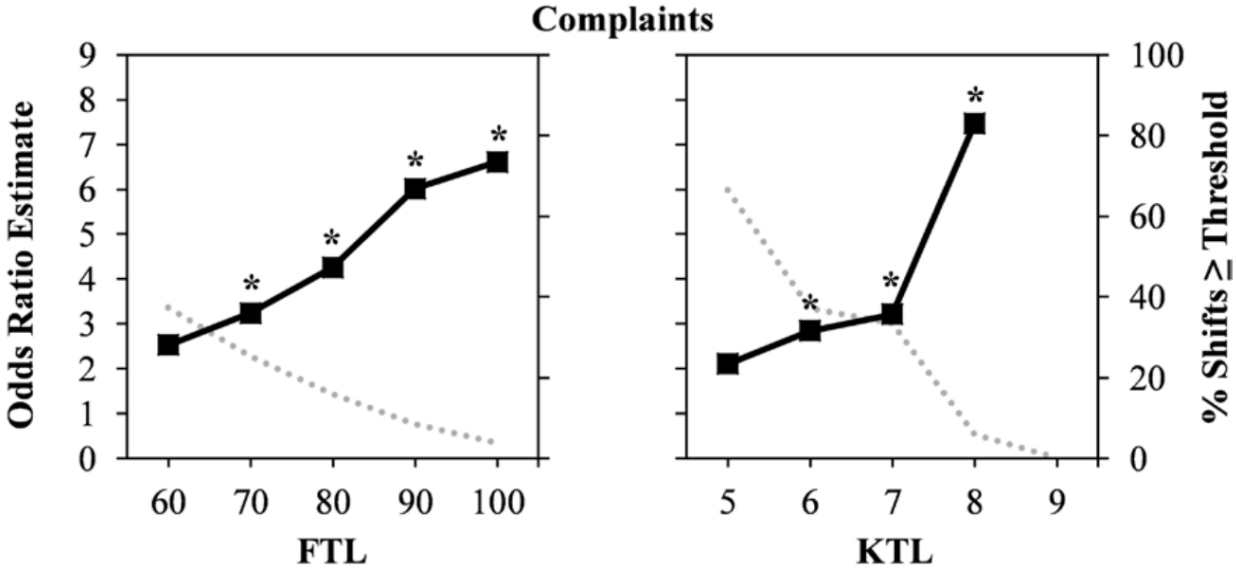
Until an organisation conducts an FHA, one option is to use the Apparent FAID Score Tolerance Level (FTL) & Apparent KSS Tolerance Level (KTL) as a rough guide.

1.3. Analysis of Fatigue Related Data

For companies that have collected fatigue related performance data, FAID Quantum provides the ability to investigate relationships between fatigue exposure (FAID and KSS scores) and the performance data, using the external results function.

Such analyses can be helpful in setting fatigue tolerance levels.

For example, in one study[2] of public complaints against police, the following relationships between likelihood of public complaint and fatigue exposure scores were found:



1.4. Task Risk and Other Considerations

When using FAID Quantum, there is no standard fatigue tolerance level recommended. This is because there are a number of considerations when setting a Tolerance Level.

Not all tasks carry the same risks. Some tasks or roles are more sensitive to fatigue-related impairment and/or have significant consequence in the event of a fatigue-related error. Controls/protections may be in place to reduce the risks associated with fatigue for a particular task/role; impacting the fatigue exposure tolerated.
Hours of work fatigue scores (FAID & KSS Score) are based on average exposure and opportunity for recovery sleep. Some environments may provide the opportunity for more (or less) rest and recovery sleep, influencing the tolerance level that is deemed appropriate. For example, workers living on site with meals provided and other domestic tasks taken care of, have less commute time and less external time pressures than the average situation.

[2] *Dawson, D., Riedy, S.M & Vila, B. (2019), US Police Rosters: Fatigue and public complaints. Sleep, 42 (3).*

1.5. Multiple Tolerance Levels

FAID Quantum enables assessment and control of hours of work fatigue exposure taking into account the risk profile of the task/job type/role, associated with the hours worked.

Most FAID Quantum users initially evaluate all work periods using a single Tolerance Level (TL), associated with the highest risk task for the hours worked.

The advanced feature of FAID Quantum enables multiple TLs to be set for different task risks associated with the hours of work being analysed.

For example, if multiple TLs for varying Task Risks (advanced feature turned on from the Settings screen) were set for FAID Score at Low = 100, Moderate = 80, and High = 65 (keeping in mind that higher risk tasks are more likely to warrant lower TLs to limit the hours of work-related fatigue exposure), a 'High' risk task work period with a Peak FAID Score of 80, would rate as a FAID Red Condition (as it is above the 'High' risk FTL of 65). Whereas, a 'Low' risk task work period with a FAID Score of 80, would rate as a FAID Green Condition (as it is less than 10 points below the 'Low' risk FTL of 100).

2. FAID & KSS Conditions

FAID & KSS Conditions are displayed within FAID Quantum in relation to the Tolerance Level set.

Increasing, relative hours of work fatigue exposure is indicated within FAID Quantum by three (FAID & KSS) Conditions Green, Yellow, and Red.

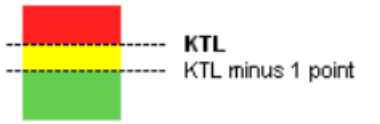
FAID Quantum nominally categorises Conditions using the following scale:

FAID Score

Red	(FAID Score above the FTL)
Yellow	(within 10 FAID Score points of the FTL)
Green	(below the FTL by 10 or more FAID Score points)

KSS Points

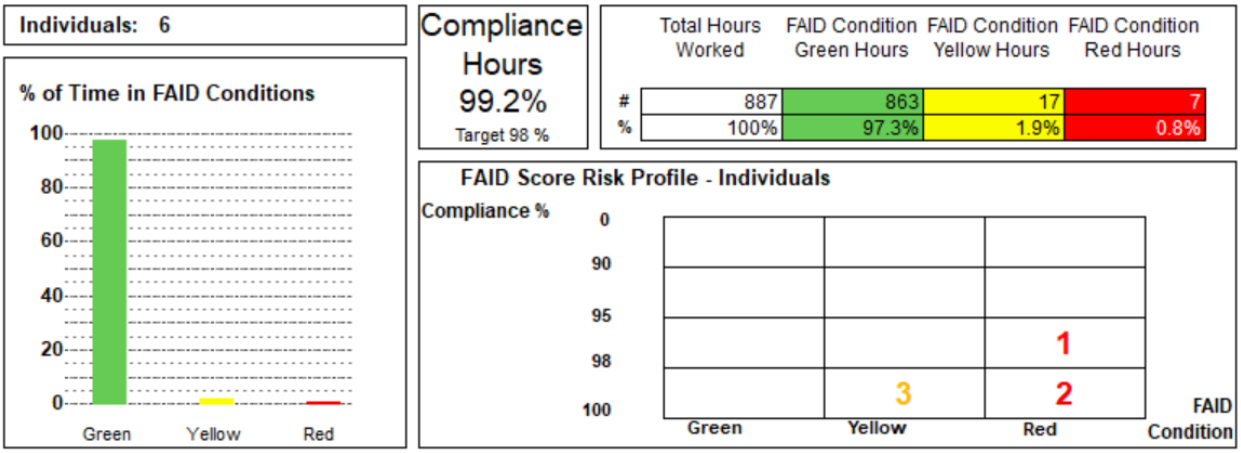
Red	(KSS above the KTL)
Yellow	(within 1 KSS point of the KTL)
Green	(below the KTL by 1 or more KSS points)

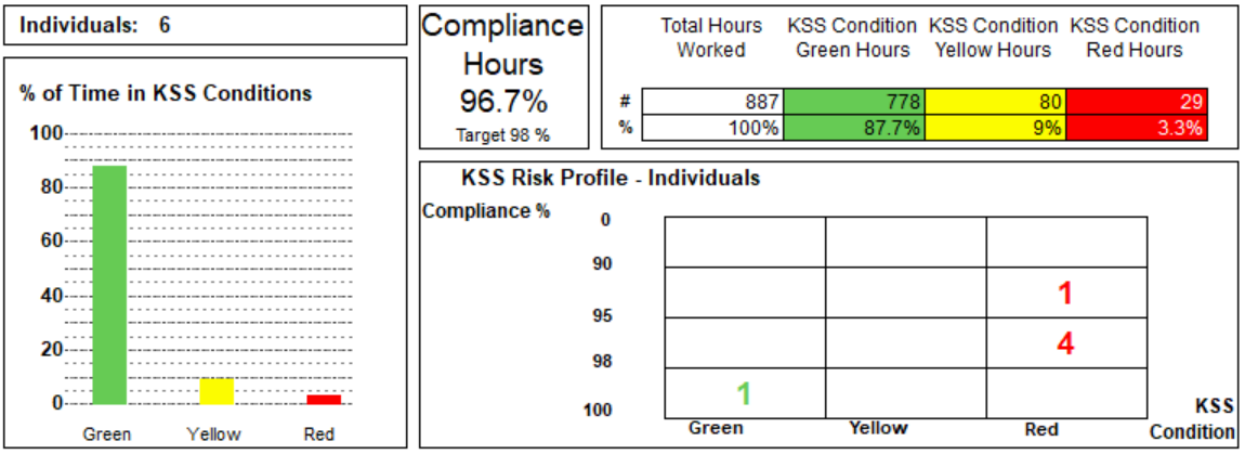


2.1. How FAID Quantum Uses Conditions in its Reporting

FAID Quantum not only provides the number of minutes worked in the various FAID and KSS Conditions for each shift, but also the percentage of time analysed overall at each Condition. The percentage of time in the Red Condition representing the percentage of Non-Compliance to the Tolerance Level (TL).

FAID Quantum also reports 'Compliance', which represents the total percentage of time worked below the TL (that is in the Green and Yellow Conditions).





Condition colouring of shifts within the ‘Gannt Chart’ and ‘Score Plot’ output screens represent the peak Condition achieved within each shift, and should not be read as indicating that the entire shift was in this Condition.

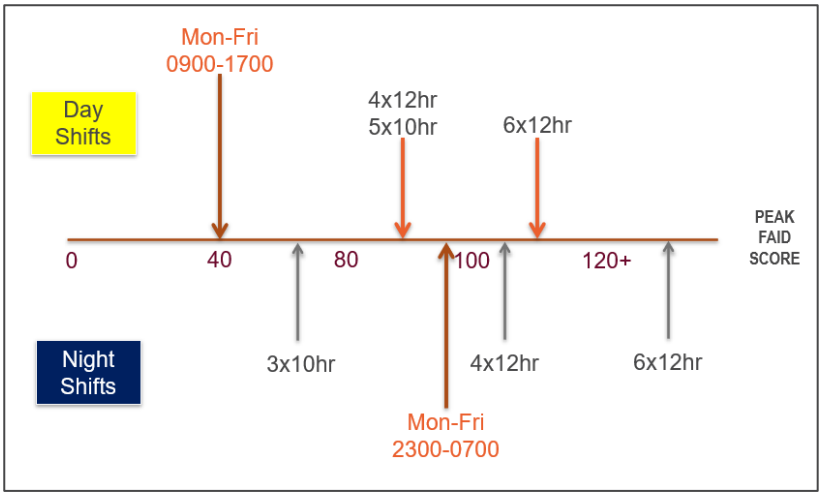
3. FAID Score

The FAID Standard BMM provides a representative score (FAID Score) of the fatigue exposure of a worker. FAID Score indicates the likely sleep opportunity that a work pattern allows. As the relative sleep opportunity associated with a work pattern decreases, the FAID Score increases. It takes into account the following biological determinants of fatigue:

- Duration of work & breaks
- Time of day of work & breaks
- Work history from preceding 7 days
- Biological limits of recovery sleep

3.1. Work Patterns

The following graphic illustrates different Peak FAID Scores for different hours of work patterns.



Peak FAID Score for work pattern over seven days

See *Appendix A* for each shift's Peak FAID Score during the work pattern for a seven day period.

3.2. Using the FAID Quantum Sample FTL of 80

FAID Quantum offers FTL=80 as a default starting value, however users must establish a value suitable to their conditions in accordance with these guidelines.

Research[3] indicates that scores between 80 and 100 are equivalent to the predicted level of work-related fatigue achieved after 23-24 hours of continuous sleep deprivation (starting at

[3] *Dawson, D. and Reid, K. Fatigue, alcohol and performance impairment. Nature July 1997, 388: 235.*

0800h). This result was observed when the sleep deprivation started at 0800h on a Monday, following a week working Monday to Friday 0900-1700h and with Saturday and Sunday off.

Performance impairment at such a level of sleep deprivation has been associated with blood alcohol concentration over 0.05%[4].

In a study of 100 train drivers driving 50 locomotives with data loggers on board, Dorian et al. (2007)[5], investigated changes in driving parameters associated with work schedules with different fatigue exposure levels (or Peak FAID Scores). Three exposure levels were categorised as part of the study:

- Low, representing work hours associated with FAID Scores of less than 65;
- Moderate, representing work hours associated with scores between 65 and 80; and
- High, representing scores of greater than 80.

Dorian et al. (2007) found that statistically significant relationships were associated with fuel consumption, heavy brake violations and higher FAID Scores. The results indicated that train drivers in the High group, with working hours associated with Peak FAID Scores of greater than 80 were more likely to perform heavy brake violations and exceed the target maximum fuel rate.

3.3. Simulator & Field Observations Data

Australian Rail Operations Research:

Simulator studies with locomotive engineers determined:

- FAID Scores 90-100 - a significant increase in errors and high risk behaviors due to fatigue: eg, less critical planning, improper braking techniques
- FAID Scores 100 & above - likelihood of errors occurring doubled

Field observations of operating behaviors & analysis of black-box data revealed:

- Scores below 90 did not result significantly in increased errors or adverse behaviors
- FAID Scores over 90 - errors increased significantly.

3.4. Validation Studies

In the Waterfall Rail Safety Investigation[6], it was determined that, in the context of these rail operations:

- FAID Scores below 80 were broadly consistent with a safe system of work.
- FAID Scores above 100 were broadly consistent with an unsafe system of work.

[4] *Fletcher, A., Lamond, N., van den Heuvel, C., & Dawson, D. (2003). Prediction of performance during sleep deprivation and alcohol intoxication by a quantitative model of work-related fatigue. Sleep Research Online, 5(2), 67-75*

[5] *Dorrian, J., Hussey, F., & Dawson, D. (2007). Train driving efficiency and safety: examining the cost of fatigue, Sleep Research, 16, 1-11*

[6] *Ministry of Transport, Waterfall Rail Safety Investigation Report 2003*

These Scores have been independently scrutinised & accepted as evidence by agencies including the Australian Transportation Safety Bureau & the Special Commission of Inquiry into the Waterfall Rail Accident near Sydney.

4. Karolinska Sleepiness Scale (KSS) Score

The FAID Quantum BMM provides a predicted fatigue score using the more familiar Karolinska Sleepiness Scale (KSS), enabling the user to better understand the numeric output aided by the descriptions associated with each score value.

The FAID Quantum BMM is able to determine a KSS Score from predicted sleep periods utilising an implementation of the Three Process Model of Alertness[7]. The implementation in FAID Quantum BMM does not include the sleep inertia component of that model.

The KSS is a 9-point Likert scale often used when conducting studies involving self-reported, subjective assessment of an individual's level of drowsiness at the time.

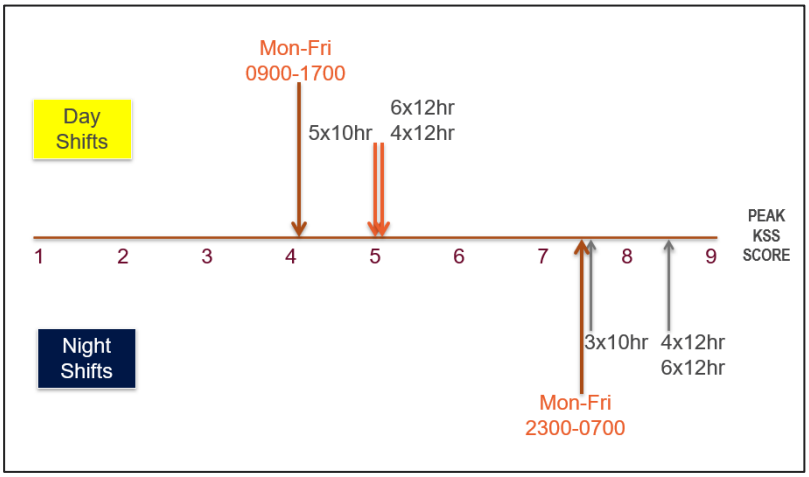
Created by researchers at the Appleton Institute KSS Scores are defined as follows:

9. Extremely sleepy, fighting sleep
8. Sleepy, some effort to keep alert
7. Sleepy, but no difficulty remaining awake
6. Some signs of sleepiness
5. Neither alert nor sleepy
4. Rather alert
3. Alert
2. Very alert
1. Extremely alert

The KSS has an extensive body of literature linking KSS Scores to actual workplace performance and objective measures of fatigue.

4.1. Work Patterns

The following graphic illustrates different Peak KSS Scores for different hours of work patterns.



Peak KSS Score for work pattern over seven days

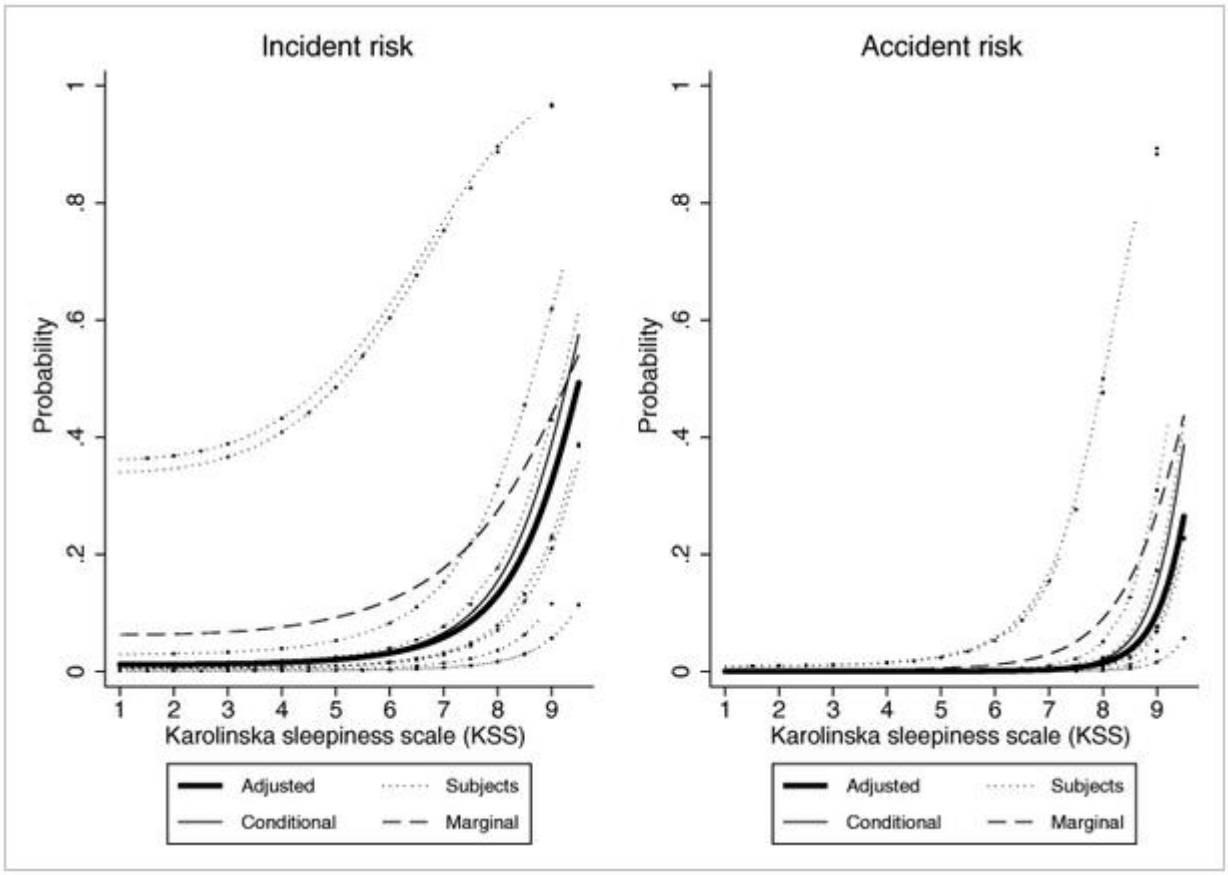
See *Appendix A* for each shift's Peak KSS Score during the work pattern for a seven day period.

[7] *Akerstadt & Folkard (1995) Validation of the S and C components of the three-process model of alertness regulation, Sleep 18:1-6*

4.2. Using the FAID Quantum Sample KTL of 7.0

FAID Quantum offers KTL=7.0 as a default starting value, however users must establish a value suitable to their conditions in accordance with these guidelines.

In one study[8] relating vehicle incident and accident rates to driver KSS, the following relationships were found.



Predicted probabilities for events during the drive. The left panel shows predicted incidents (including accidents) and the right panel shows predicted accidents (including crashes) as a function of sleepiness. The conditional plots are based on the unadjusted coefficients and the adjusted plots are the conditional estimates multiplied with factor lambda (0.93). Plots for individual subjects indicate empirical Bayes' estimates and the marginal plots indicate group averages.

[8] *Ingre, M., Torbjorn, A., Peters, B., Anund, A., Kecklund, G. & Pickles, A. (2004) Subjective sleepiness and accident risk avoiding the ecological fallacy, J. Sleep Res. 15, 142-148*

5. Fatigue Hazard Analysis

When individuals perform tasks in a workplace they are exposed to fatigue hazards.

5.1. The Definition of a 'Fatigue Hazard'

A "fatigue hazard" is defined as a known characteristic, inherent property, vulnerability, condition or unintended action that represents a potential threat to people, property, the environment or business profitability that can be triggered by fatigued individuals.

Work-related fatigue and consequent changes in alertness, reaction time, decision-making, communication, and other performance impairments associated with fatigue can increase safety risks, and the likelihood/consequence of an error, accident or incident.

5.2. How to Assess Fatigue Related Risks and Prioritise Treatments

An organisation can perform a task Fatigue Hazard Analysis risk assessment[9] to identify the fatigue hazards, which are specific to their workplace and their tasks. InterDynamics' Fatigue Hazard Analysis risk assessment process assesses the impact that fatigue-specific triggers have on the likelihood and consequence of hazard scenarios for that role/task. Risk improvement actions, as outcomes of the FHA risk assessment, can therefore target protections against fatigue-triggered events, as well as controls to minimise/treat fatigue.

5.3. What Makes InterDynamics' Fatigue Hazard Analysis (FHA) Process Different from Most Risk Assessments?

Other risk assessment processes which either do not take fatigue into account as a trigger, or only target reducing the likelihood of fatigue, do not result in controls that manage the risks that present when fatigue is at play (i.e. the fatigue context). Additionally, risk assessments that identify contributors to fatigue as the hazard rarely assess the consequence of fatigue. Understanding the level of consequence assists in deciding (and prioritising) what actions are required, as the existence of fatigue itself may not necessarily result in an adverse/intolerable event.

Focusing on controls that reduce fatigue is a positive step towards minimising fatigue-related risks, however this is not enough when wishing to manage fatigue from an overall risk perspective. Practically, fatigue may not always be avoidable, for example during emergencies, staff shortages, times of stress, minor illness/colds, etc., and adequate layering of protections to cover these situations is required.

The fatigue context exists in many work situations and not only within organisations that require shift work or 24-hour operations. Within this context, it is important that risk assessments treat

[9] InterDynamics' risk assessment methodology founded on Zurich's Hazard Analysis methodology aligned with AS/NZS ISO

the hazards of the role/task, as well as minimising fatigue itself. InterDynamics' Fatigue Hazard Analysis risk assessment process does this through a consultative process with staff and management, resulting in the quantifying of risks, prioritisation of improvement actions, and targeting risks to levels tolerable to the organisation, all within the context of fatigue.

5.4. Why an FHA is the Best Way to Determine Hours of Work Tolerance Thresholds (including appropriate Fatigue Tolerance Levels and Target Compliance percentages)

Wherever possible, an FHA is best performed as the uniting piece of the 'Determine' stage of the Risk-Based Approach to Fatigue Management. This means that the recommendations and decisions made at an FHA risk assessment workshop are well informed; not only by the task and environmental risk assessment performed in the context of a fatigued workforce, but also from organisational data on absenteeism (which can be an indicator of fatiguing work schedules), occurrences, accidents and incidents, and other work that (ideally) has gone before, in determining how big and how bad the issue of fatigue is within the workforce. These other assessments to determine the fatigue risk profile of the workforce include:

- An employee Managing Fatigue Survey
- A FAID Quantum Hours of Work Diagnostic of planned and actual hours worked

A key outcome of a Fatigue Hazard Analysis is the establishment of FAID Quantum indicative Fatigue Tolerance Levels (TLs) and Target TL Compliance percentages deemed appropriate by the organisation for each task. This process takes into account the current hours of work fatigue exposure analysed using FAID Quantum, including the Apparent TL/overall hours of work fatigue exposure currently being tolerated by the organisation.

5.5. Outcomes of a Fatigue Hazard Analysis and Further Information

Once set, hours of work-related fatigue exposure can be limited by allocating work hours within FAID Score and KSS benchmark figures (**Tolerance Levels/TLs**), and Target TL Compliance percentages, for specific tasks or roles. A lower TL may be set for a higher risk task or role, and a higher TL may be set for a lower risk task or role. For a specific task or role, one TL may be used for planned hours of work, with the option of reviewing actual hours against a higher TL, acknowledging that variances to the plan may occur on day of operations.

Other outcomes of an FHA include:

- Increased employee engagement and contribution in the identification of acceptable fatigue related risk exposure levels, and other necessary controls that can inform the development and continuous improvement of the Fatigue Management Plan; leading to the reduction of overall fatigue-related risk, and greater acceptance and effectiveness of risk improvement actions (including the use of FAID Quantum)
- Treatments/controls that are transparent, agreed & specific to each team/group/department
- Acceptable & unacceptable fatigue-related risks identified and made clear to all

- Security of knowing that the Fatigue Risk Management component of the Safety Management System is being based on data from objective analysis & organisational experience
- Documented records of outcomes and the level of rigour applied to determining tolerable levels of fatigue related risk exposure and recommended treatments
- Prioritisation for risk reduction investments
- Benchmark data for future review of fatigue-related exposures and controls
- Fatigue Risk Management controls that are transparent, agreed and understood at all levels, and sit above regulatory compliance-based systems
- Increased employee confidence in the ongoing commitment by the organisation to reducing fatigue-related risk through regular reviews and best practice processes
- Improved knowledge and communication through information about fatigue-related risk & scientific facts of sleep deprivation being available to all
- Consistent, repeatable, fatigue-related risk assessment & documentation processes

Further information on the Fatigue Hazard Analysis risk assessment process can be found here.

6. FAID Quantum: One Component of Many Within a Risk-Based Approach

Understanding and managing your organisational risk profile with relation to fatigue is an important process within FRMS that involves looking at multiple areas of exposure. For example, a view of the organisation's fatigue risk profile can be gained by determining the:

- Fatigue risk profile of the workforce through an employee Managing Fatigue Survey;
- Hours of Work risk profile through a FAID Quantum Hours of Work Diagnostic of planned and actual hours worked;
- Workplace hazards in the context of fatigue, associated with specific roles and environmental factors through a Fatigue Hazard Analysis risk assessment;
- Drawing it all together with a fatigue risk grading will provide contextual data on the specific system level fatigue-related risks for your organisation, and how to manage them effectively within a true risk-management framework.

As can be seen, the use of FAID Quantum in determining the Hours of Work risk profile is one component of many.

You can read more about InterDynamics' Risk Based Approach to Managing Fatigue in *Appendix B: InterDynamics Methodology.*

7. Further Recommended Reading

Below are some documents available from InterDynamics for further reference:

- Getting Real About BMMs
- What you need to know about FAID Quantum

Further articles about Biomathematical Models and Fatigue Risk Management can be found on our website here.

Appendix A - Peak FAID & KSS Score Example Shifts

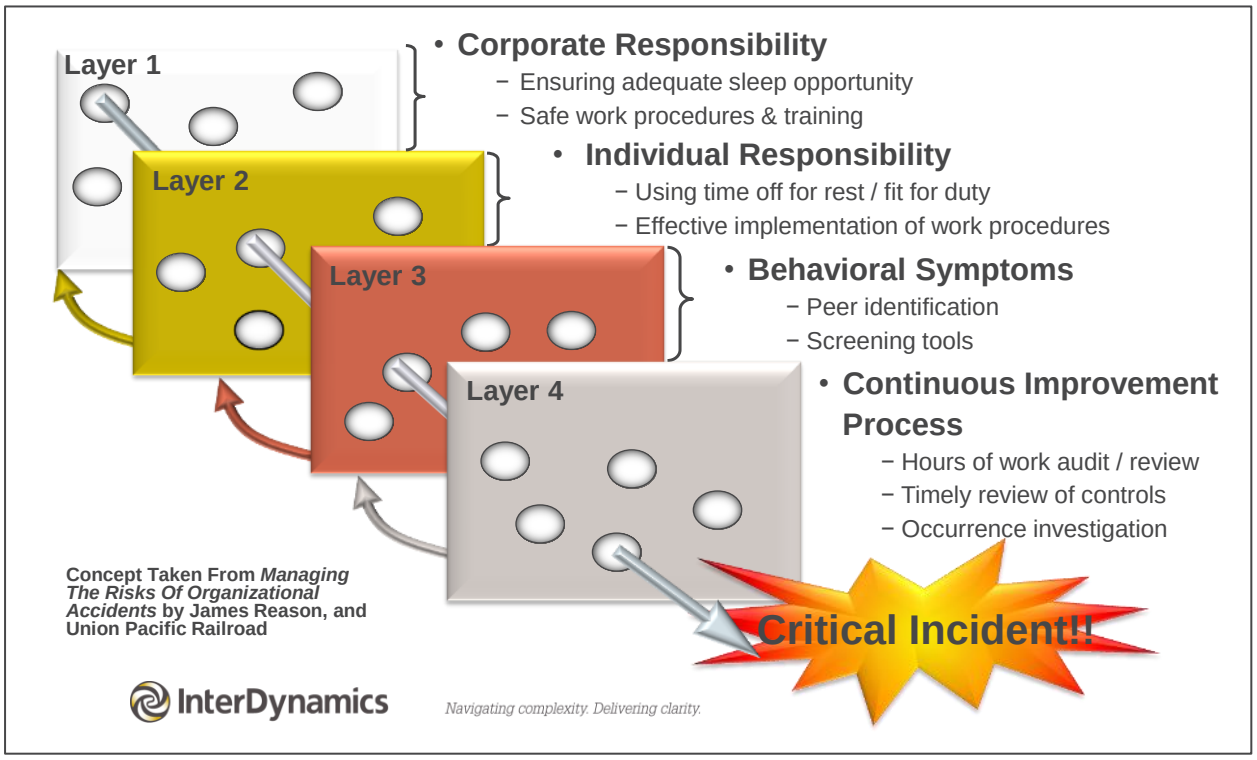
Shift Type	Shift #	Start	End	Peak FAID Score	Peak KSS Score	Non-Work	Work
Mon-Fri 0900-1700	1	8/08/2016 9:00	8/08/2016 17:00	25	3.7	64	8
Mon-Fri 0900-1700	2	9/08/2016 9:00	9/08/2016 17:00	29	4.0	16	8
Mon-Fri 0900-1700	3	10/08/2016 9:00	10/08/2016 17:00	33	4.1	16	8
Mon-Fri 0900-1700	4	11/08/2016 9:00	11/08/2016 17:00	37	4.1	16	8
Mon-Fri 0900-1700	5	12/08/2016 9:00	12/08/2016 17:00	41	4.1	16	8
Mon-Fri 2300-0700	1	8/08/2016 23:00	9/08/2016 7:00	65	7.1	64	8
Mon-Fri 2300-0700	2	9/08/2016 23:00	10/08/2016 7:00	73	7.2	16	8
Mon-Fri 2300-0700	3	10/08/2016 23:00	11/08/2016 7:00	81	7.3	16	8
Mon-Fri 2300-0700	4	11/08/2016 23:00	12/08/2016 7:00	89	7.4	16	8
Mon-Fri 2300-0700	5	12/08/2016 23:00	13/08/2016 7:00	97	7.4	16	8
3x10hr 1800	1	8/08/2016 18:00	9/08/2016 4:00	34	7.4	110	10
3x10hr 1800	2	9/08/2016 18:00	10/08/2016 4:00	48	7.5	14	10
3x10hr 1800	3	10/08/2016 18:00	11/08/2016 4:00	62	7.5	14	10
4x12hr 0600	1	8/08/2016 6:00	8/08/2016 18:00	35	4.7	84	12
4x12hr 0600	2	9/08/2016 6:00	9/08/2016 18:00	49	5.0	12	12
4x12hr 0600	3	10/08/2016 6:00	10/08/2016 18:00	62	5.1	12	12
4x12hr 0600	4	11/08/2016 6:00	11/08/2016 18:00	76	5.1	12	12
4x12hr 1800	1	8/08/2016 18:00	9/08/2016 6:00	64	7.9	84	12
4x12hr 1800	2	9/08/2016 18:00	10/08/2016 6:00	79	8.2	12	12
4x12hr 1800	3	10/08/2016 18:00	11/08/2016 6:00	94	8.3	12	12

4x12hr 1800	4	11/08/2016 18:00	12/08/2016 6:00	110	8.4	12	12
5x10hr 0600	1	8/08/2016 6:00	8/08/2016 16:00	47	4.7	62	10
5x10hr 0600	2	9/08/2016 6:00	9/08/2016 16:00	55	4.9	14	10
5x10hr 0600	3	10/08/2016 6:00	10/08/2016 16:00	63	5.0	14	10
5x10hr 0600	4	11/08/2016 6:00	11/08/2016 16:00	71	5.0	14	10
5x10hr 0600	5	12/08/2016 6:00	12/08/2016 16:00	79	5.0	14	10
6x12hr 0600	1	8/08/2016 6:00	8/08/2016 18:00	78	4.8	36	12
6x12hr 0600	2	9/08/2016 6:00	9/08/2016 18:00	83	5.0	12	12
6x12hr 0600	3	10/08/2016 6:00	10/08/2016 18:00	87	5.1	12	12
6x12hr 0600	4	11/08/2016 6:00	11/08/2016 18:00	92	5.1	12	12
6x12hr 0600	5	12/08/2016 6:00	12/08/2016 18:00	96	5.1	12	12
6x12hr 0600	6	13/08/2016 6:00	13/08/2016 18:00	101	5.1	12	12
6x12hr 1800	1	8/08/2016 18:00	9/08/2016 6:00	108	8.0	36	12
6x12hr 1800	2	9/08/2016 18:00	10/08/2016 6:00	113	8.2	12	12
6x12hr 1800	3	10/08/2016 18:00	11/08/2016 6:00	118	8.3	12	12
6x12hr 1800	4	11/08/2016 18:00	12/08/2016 6:00	124	8.4	12	12
6x12hr 1800	5	12/08/2016 18:00	13/08/2016 6:00	129	8.4	12	12
6x12hr 1800	6	13/08/2016 18:00	14/08/2016 6:00	134	8.4	12	12

Appendix B - InterDynamics' Methodology

Many organisations faced with the challenge of managing fatigue can easily become daunted by the prospect. Impairment associated with fatigue can be difficult to detect, and harder still, is judging the level of impairment that could present a danger. Added to the complexity of individual differences in experiencing fatigue is the context for individuals (e.g. job type, activities, environment, time of day, etc.) and the degree to which this is vulnerable to fatigue.

Given the diverse factors needing to be taken into account in managing work-related fatigue, a risk-based approach that gives consideration to models like James Reason's 'Swiss Cheese' model is often recommended.



The Defences-in-Depth model (Dawson & McCulloch, 2005) applies James Reason's model to the fatigue context, targeting prevention through a series of barriers, safeguards, and defences. InterDynamics has included these concepts and ideas in its Risk-Based Approach to managing fatigue, summarised in the diagram *Our Risk-Based Approach to Managing Fatigue* at the end of this Appendix.

InterDynamics' approach recognises the development of an appropriately informed plan to manage fatigue (a Fatigue Management Plan) as foundational to the effective implementation and on-going improvement of a Fatigue Risk Management System (FRMS). Staff engagement and consultation is key to a smooth FRMS implementation, as cultural change is often required for the organisation to transition its perception and management of fatigue in line with the organisation's fatigue policy commitment.

Our experience assisting clients of all sizes across various industries and circumstances has brought insights into the most effective organisational team structures and project plans for successful implementation.

The aim of the Risk-Based Approach is to provide our clients with the best possible tools and resources to manage fatigue risks. It is founded on four pillars: consultation, staff engagement, shared responsibility and effective risk management.

This comprehensive methodology includes three key steps:

Determining the fatigue risk profile of the organisation

Protecting against unacceptable fatigue-related risks

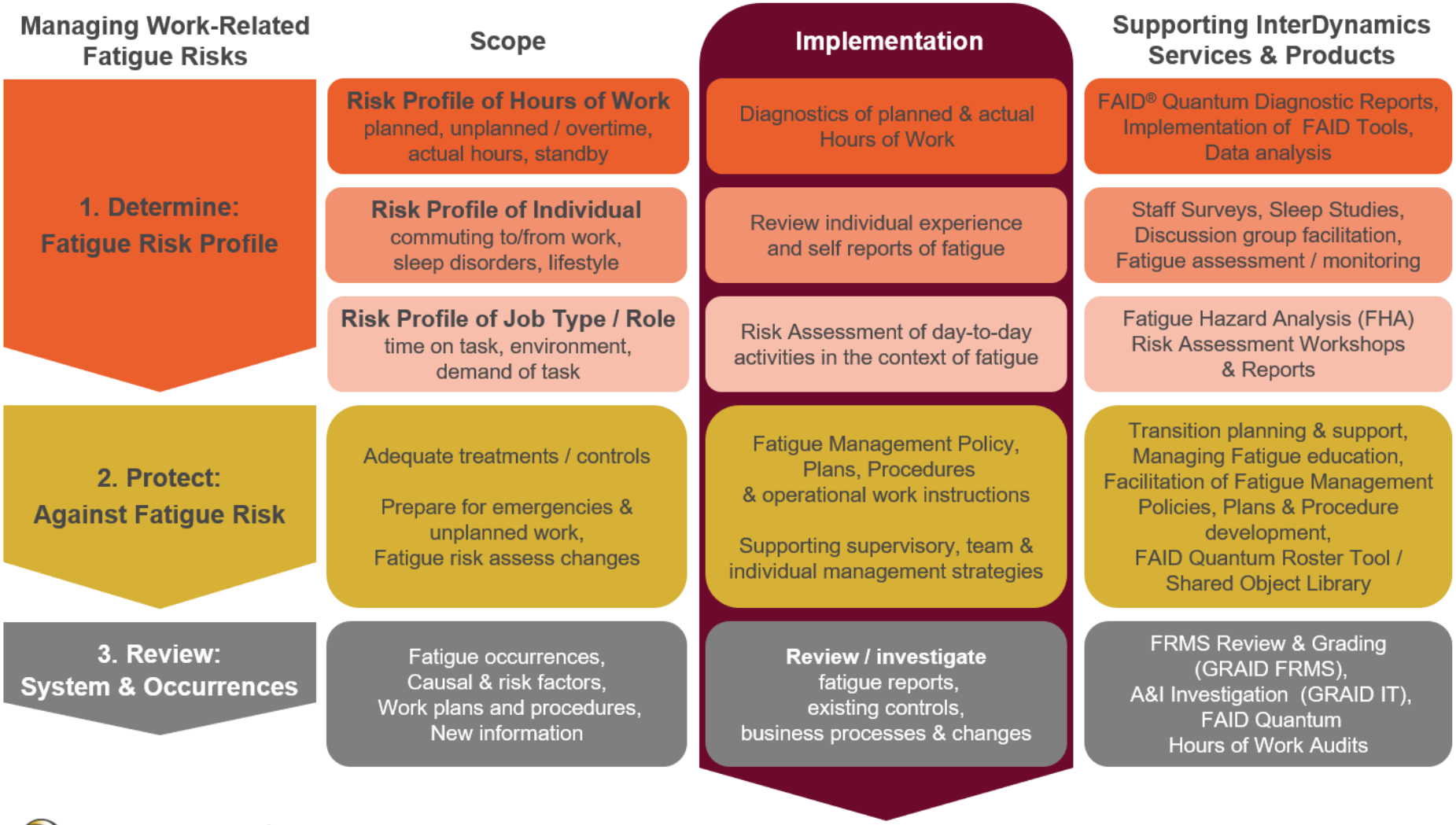
Reviewing systems to ensure protection measures remain adequate

Suggested FRMS Scope and Implementation activities are outlined in the second & third columns of the diagram, respectively. The last column presents supporting InterDynamics services and products that facilitate the FRMS journey. Deliverables and findings from each implementation activity give additional insight into the organisation's specific requirements for managing fatigue effectively, as well as providing valuable input into the Fatigue Management Plan and supporting Work Procedures.

InterDynamics' Risk-Based Approach to managing fatigue targets improved safety and performance as key outcomes of the FRMS.

InterDynamics and Zurich Risk Engineering have developed an organisational fatigue risk grading system (GRAID™) to provide senior and operational managers with a systematic methodology to ascertain the quality of their organisational risks associated with fatigue. In conducting FRMS reviews, InterDynamics can provide a valuable third-party perspective on the depth, breadth and relevance of your Fatigue Risk Management System.

Our Risk-Based Approach to Managing Fatigue



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