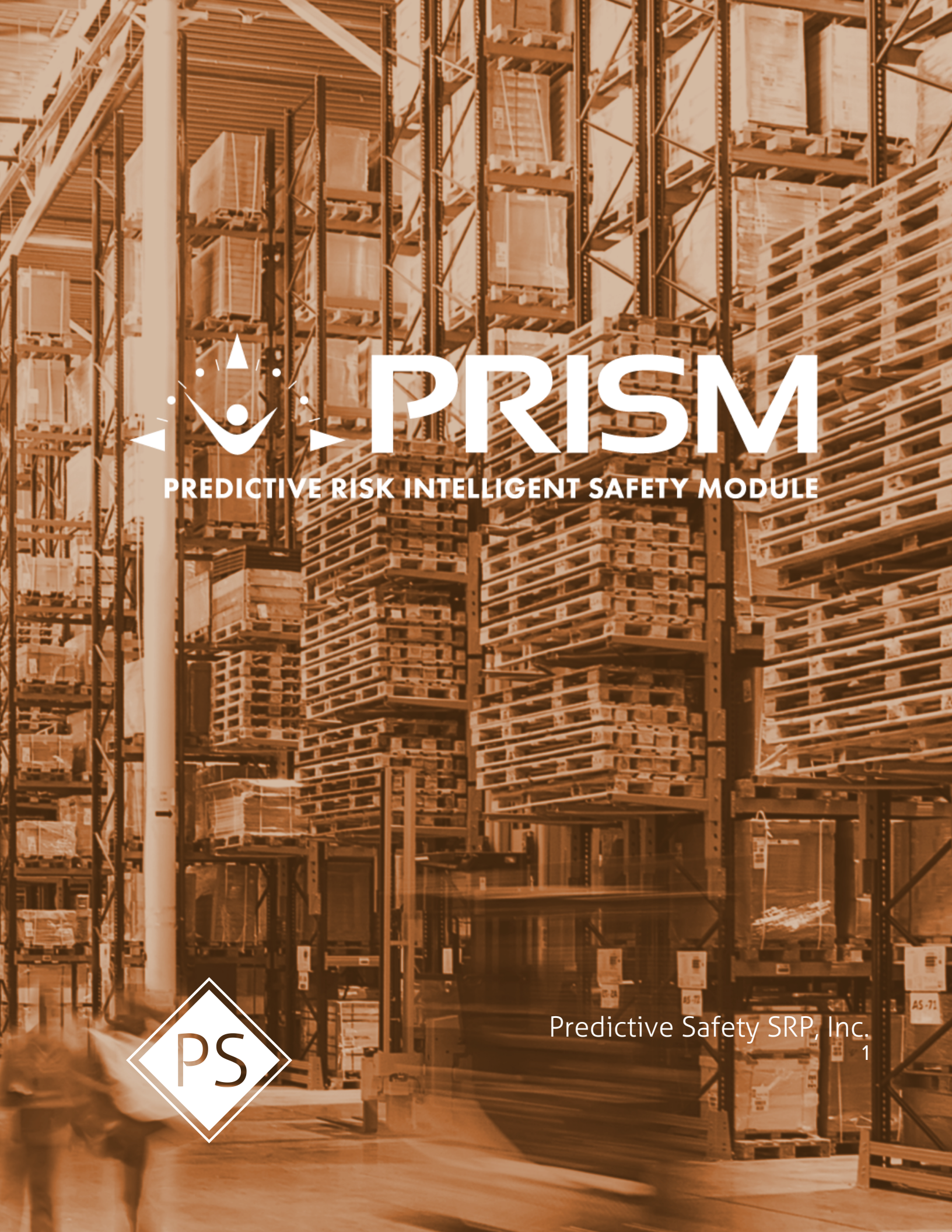

PRISM

PREDICTIVE RISK INTELLIGENT SAFETY MODULE

PS

Predictive Safety SRP, Inc.

What Is PRISM?

PRISM is a predictive fatigue monitoring platform that anticipates when fatigue will occur in any shift work environment. Its proprietary algorithm uses predictive modeling from lagging indicators and real-time analysis to manage fatigue before it can impact the work environment, reducing risk and increasing quality of work and production.

With PRISM, management has greater visibility to data, allowing them to make better decisions regarding fatigue's impact on their work environment. Suggested policy changes are included in the system to help supervisors address issues.

Fatigue affects a company's bottom line far before the point of failure. Slow responses, poor decisions, forgetfulness, lack of focus, poor communication, and diminished productivity are just as detrimental to a work environment as falling asleep on the job.

PRISM goes beyond scheduling alone by creating real-time analysis and real-time solutions. Using existing systems within the environment, PRISM alerts the employee that fatigue is impending, and ahead of the onset of fatigue, provides simple, validated countermeasures so the employee can stay alert. PRISM has proven to reduce fatigue-related incidents by 27% and reduce the cost of accidents by 70% while reducing hours worked in fatigue up to 38%.

Features:

- Provides real-time fatigue status for every employee
- Monitors and mitigates worker fatigue in real-time
- Document compliance to fatigue-related company policies
- Monitors work hours in real-time
- Continuously calculates fatigue scores
- Issues specific fatigue countermeasures to workers (and alerts to their supervisors) when a fatigue-risk threshold has been crossed
- Allows employees to verify their alertness levels as needed
- Identifies current and potential deviations from company policies
- Provides in-depth reporting features and record keeping
- Drives down the cost and risk of managing fatigue

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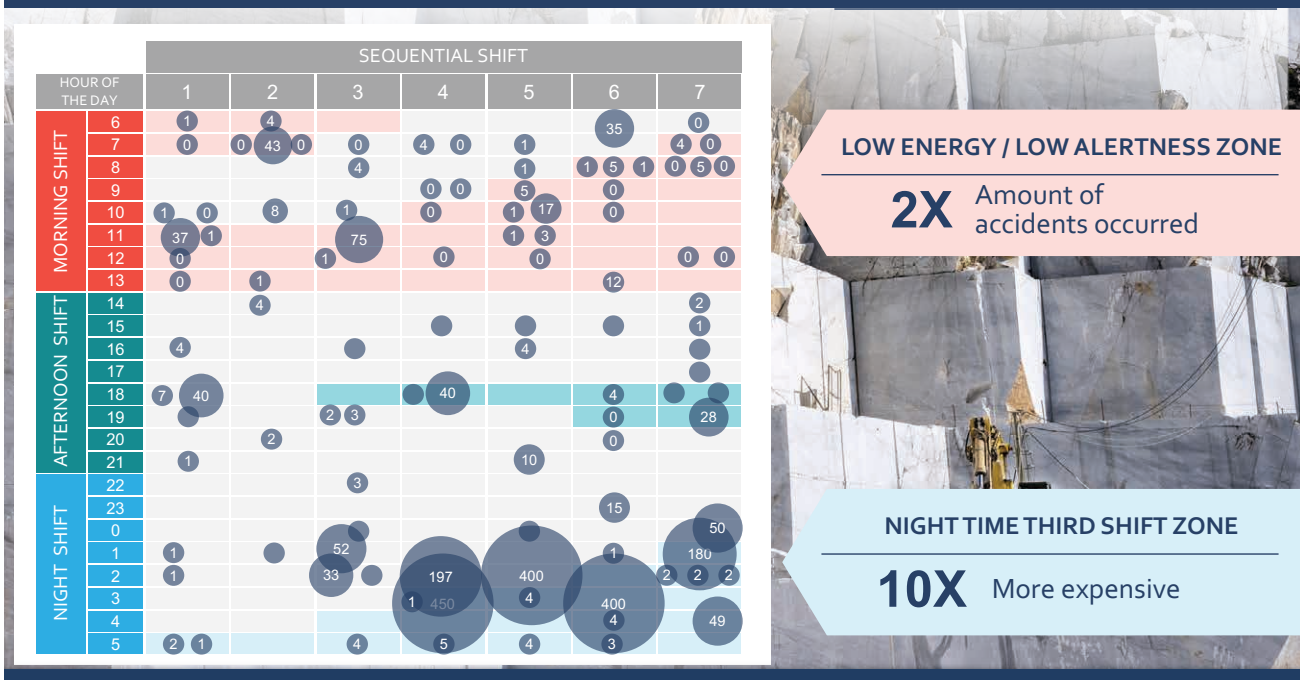
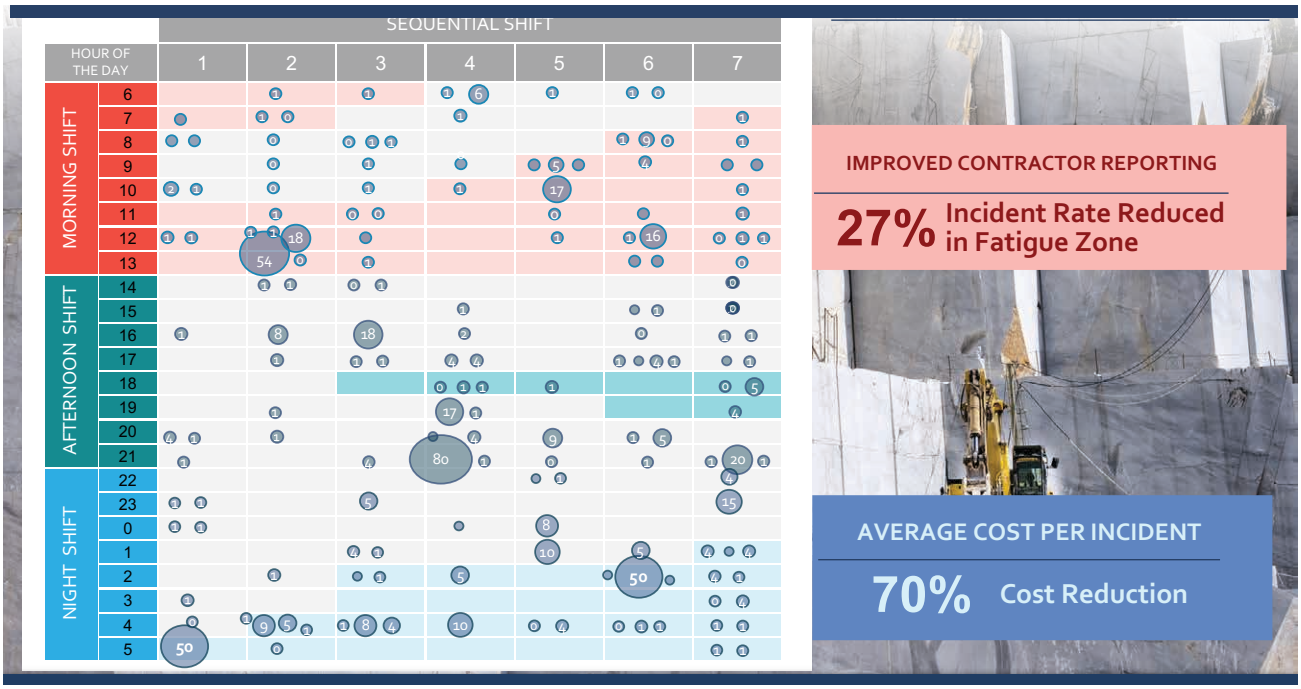
PRISM

Results

Fatigue's Impact Before PRISM



Fatigue's Impact After PRISM



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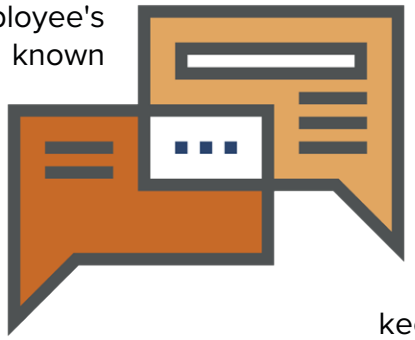
How It Works

PRISM utilizes timekeeping data from whatever system is used at the site or on a provided login device to generate a time stamp when employees come onto the site. The information captured is sent to the risk calculator, which then predicts the fatigue risk, based on the employee's recent work history and anomalies known to contribute to fatigue. If PRISM determines the employee is entering a fatigue zone, it will notify the employee at clock-in and send out an alert at the appropriate time.



The alert goes to the individual and/or supervisor through the work environment's existing communication system, such as a text message on a cell phone, or a call over the radio. The employee interacts with the system, which informs them of their fatigue status, and it allows them to take an alertness test, select a countermeasure, or both. Once the fatigue risk reaches a certain level or if the employee does not respond, management is also notified. At a higher risk of fatigue, management will want to be involved in making informed decisions about what work the individual should be doing.

On the Supervisor Dashboard, PRISM constantly updates the status of each employee, showing when their condition will downgrade, and how many hours they have left on their shift or overtime. The system can provide reports for any type of data confirmation required.

Depending on the nature of employees' commuting to and from work, when employees clock out, the system also calculates what their fatigue risk will be on the way home. PRISM keeps employees alert and safe, door to door.

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Common Questions

In what industries is PRISM beneficial?

Virtually any setting where fatigue-related accidents occur could benefit from PRISM. There is no shortage of catastrophic domestic and international incidents that could have been avoided had a product such as PRISM been in place. PRISM can provide a multitude of industries with demonstrable and measurable benefits through improved productivity combined with reduced human and equipment costs.

Will PRISM pull my workers off shifts?

PRISM gives employees a head start on heading off fatigue. We train your supervisors and workers to leverage the indicators so that shifts are not interrupted.

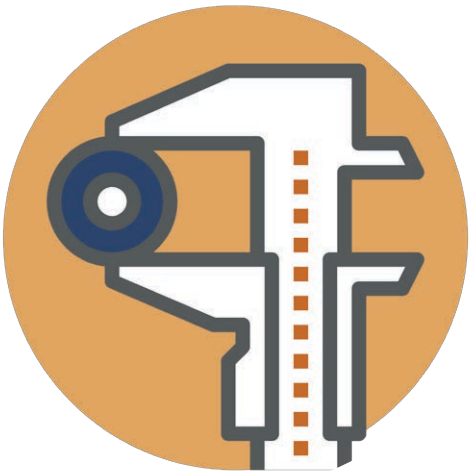
Can PRISM be used anywhere?

Yes, in both controlled environments and dispersed environments. PRISM has important additional value as a compliance tool for contract work. Contractors and employees can both use the system, with separate tracking and reporting.

PRISM works extremely well with variable schedules. The more geographically dispersed the workforce, the more value it can bring.

How hard is it to install?

PRISM works with any existing scheduling platform, and requires little hardware to set up. It has been implemented successfully in very low-tech environments.



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Fatigue Modeling
Science

The analytical component of PRISM is one of a handful of fatigue modeling programs that use bio-mathematical models based on a scientific understanding of the factors that contribute to fatigue. This particular algorithm also utilizes numerous other variables that predict fatigue. This and other similar models have been used over the past 15 years in designing work schedules and improving productivity at numerous multi-national companies.

Fatigue Modeling Overview

Most fatigue models are based on a model created by Swiss sleep scientist Alexander Borbély in the early 1980s, referred to as the Two-Process Model of Sleep-Wake Regulation. This model, developed on the basis of many laboratory experiments, was intended to explain both the timing and duration of sleep as a result of the interaction between two processes:

1. Circadian Rhythm, or Process C, is the regulation of the body's internal processes and alertness levels. It is governed by the internal biological or circadian clock. Although this process cycle is slightly greater than 24 hours, it is influenced by external factors such as the light and dark cycle of the local environment.

2. Sleep-Wake Homeostasis, or Process S, is the accumulation of hypnogenic (sleep-inducing) substances in the brain, which generates homeostatic sleep drive. During sleep, Process S decreases exponentially. Process S is therefore directly related to sleep loss and produces the so-called "sleep pressure" that builds up during time awake. Lack of sleep and/or extended duty time directly increase Process S.

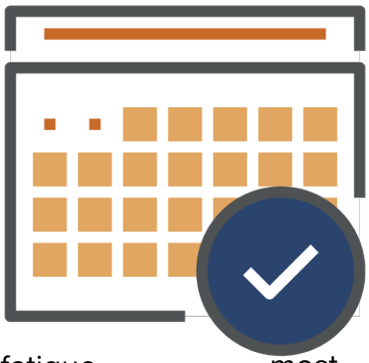
The Two-Process Model focused entirely on sleep and was not intended to model fatigue or alertness. Therefore, the Three-Process Model of Alertness (TPMA; Åkerstedt & Folkard, 1995, 1996) upon which PRISM's fatigue model is based, extended Borbély's initial model by predicting the level of alertness and by adding the Process W (Waking), relating to sleep inertia. Sleep inertia refers to the transient state of lowered arousal occurring immediately after awakening from sleep and producing a temporary decrement in performance (Tassi & Muzet, 2000).

Most bio-mathematical models are based on the Two- and Three- Process Models. PRISM's bio-mathematical model also considers various other inputs that make its predictions more accurate for the occupational environment.

Data Requirements

Inputs:

The inputs to a bio-mathematical fatigue model enable the model to determine output predictions. One or two types of information are generally required to predict fatigue: work-rest schedule or sleep data. Sleep data can be obtained from either subjective data, such as employees entering their range of sleep hours into a hardware device as they clock in to their current shift, or from objective data, which might be pulled from a wearable actigraphy band.



One of the frequently observed limitations of most bio-mathematical models is that they predict fatigue for the 'average' person, without taking into account individual differences and the type of tasks or work context involved. PRISM has customized its use of the fatigue model by adding additional inputs, making its predictions of fatigue risk more accurate. They include:

1. Job profile and risk assignment
2. Working over twelve hours
3. Double shifts
4. Insufficient time off between shifts
5. Insufficient time off between shift pattern changes or adjustments
6. Total hours per week or per month
7. Impact of commute time in fatigue

Outputs:

From the User perspective, the outputs of the models are important features as they are used by the organization to evaluate and make critical decisions in managing the hours of work, and the current fatigue risk, for employees.

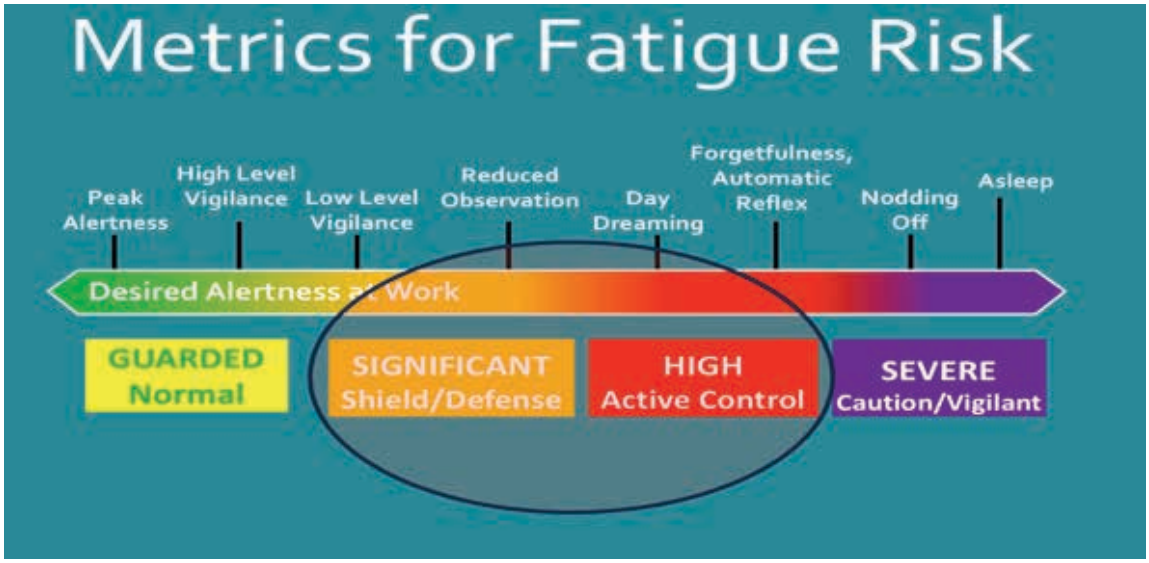
While the primary aim of most of the models is to predict fatigue, other metrics are added to provide a range of outputs. In practice, the critical aspect of these metrics is their ability to predict an estimated risk level from fatigue or sleep data.

Most of the bio-mathematical models provide a fatigue or alertness prediction value over a given work period. These values are generally expressed on a subjective scale. The most commonly used scales are the Karolinska Sleepiness Scale (Åkerstedt & Gillberg, 1990) and the Samn Perelli fatigue scale (Samn & Perelli, 1982). PRISM uses the Samn Perelli measurement scale below to inform its predictive risk levels and confirms its fatigue prediction accuracy on the Karolinska scale against self-reported sleepiness.

Measuring Fatigue

Risk Index Measurement Scale						
Signia Risk *5 Point*	Signia (Refined) *7 Point*	Scale	Range	Potential % Exposed and/or Diminished Capacity	Strategy *5 Point*	Strategy *7 Point*
Low	Nominal	10	9.51 - 10+	0%	Maintain	Optimal
		9	8.51 - 9.50	5%		
		8	7.51 - 8.50	10%		
	Low	7	6.51 - 7.50	15%		Maintain (Preserve-Conserve)
		6	5.51 - 6.50	20%		
		5	4.51 - 5.50	25%		
Guarded	Guarded	4	3.51 - 4.50	30%	Protect	Protect (Watchful/Attentive)
		3	2.51 - 3.50	35%		
		2	1.51 - 2.50	40%		
Significant	Significant	1	.51 - 1.50	45%	Guard	Guard (Shield/Defense)
		0	.50 - (-.50)	50%		
		-1	-.51 - (-1.50)	55%		
High	High	-2	-1.51 - (-2.50)	60%	Proactive	Proactive (Active/Control)
		-3	-2.51 - (-3.50)	65%		
		-4	-3.51 - (-4.50)	70%		
Severe	Severe	-5	-4.51 - (-5.50)	75%	Vigilant	Vigilant (Cautious/Alert)
		-6	-5.51 - (-6.50)	80%		
		-7	-6.51 - (-7.50)	85%		
	Extreme	-8	-7.51 - (-8.50)	90%		Priority 1
		-9	-8.51 - (-9.50)	95%		
		-10	-9.51 - (-10+)	100%		

PRISM's Fatigue Scale works to keep employees in the area circled below, before "fatigue failure" becomes inevitable.



Measuring
Fatigue

Although the Samn & Perilli and Karolinska scales are widely used, PRISM's fatigue model goes further in predicting fatigue by using additional inputs such as PRISM's AlertMeter test, shown below, which measures neurobehavioral performance in real-time. Employees take this brief test prior to work or during break periods to assess their alertness in that moment, against a pre-established individual baseline.

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Outputs Through Reporting

The scientific foundation for fatigue modeling comes from laboratory experiments in which temporal profiles of fatigue for healthy subjects under imposed sleep restrictions or simulated time zone shifts are measured using objective neurobehavioral tests. Most fatigue models are used for scheduling purposes only; therefore, the vast amount of data that PRISM has been able to compile and analyze by engaging employees in real time demonstrates a significant advantage in its ability to accurately predict fatigue as well as assist the User in analyzing the data for a variety of purposes.

The fatigue model's Process Flow also assists PRISM provide the following features:

1. Evaluating Schedules
2. Quantifying Fatigue Level on Demand
3. Recommending Countermeasures
4. Understanding Variable Job Types
5. Tracking Individual Levels
6. Tracking Actual Hours Worked
7. Understanding Off-shift Work
8. Understanding Shift Changes
9. Evaluating Post-shift Fatigue
10. Comprehending Job Class Changes