L.F. MARTIN, PHD, CIH, CSP
HSEQ ADVISER

Technical Review and Opinion Memorandum

To: Carol Setters, Predictive Safety

From: Linda F. Martin, PhD, CIH, CSP, CHMM

Date: February 21, 2022

Re: Technical Review and Professional Opinion: AlertMeter® and PRISM

Purpose of Review:

Evaluation of design methodology and functionality of the AlertMeter® and PRISM products

Documents Reviewed:

1. Research articles for predictive safety science used to design the methodology and functionality of the AlertMeter® and Prism products

2. Peer-reviewed research articles on Fatigue Risk Management Systems (FRMS) and bio-mathematical predictive models for fatigue

3. Predictive Safety documents summarizing quantitative and qualitative data collected during the use of AlertMeter® and PRISM products active work sites

4. Predictive Safety internal documentation regarding fatigue analyses, gaming methods, and biomathematical modeling; and,

5. Product documentation for both the AlertMeter® and Prism products.

Review:

The Predictive Safety AlertMeter® and PRISM product offerings belong to a class of workplace fatigue tools defined as FRMS. Generally, FRMS provide a data-driven set of management practices for identifying and managing fatigue-related safety risks. FRMS approaches consider sleep and work time and is based on ongoing risk assessment and monitoring.

Bio-mathematical models that predict fatigue have proved a useful addition to management strategies for fatigue-related risk (Dawson, Darwent & Roach, 2017). Circadian factors are primary components of the capabilities of successful FRMS biomathematical models, with

variations in the input into the models of sleep and work times, physical reaction times, and other proprietary input factors for prediction (Mallis, Mejdal, Nguyen & Dinges, 2004; Honn, Dongan & Dawson, 2019). When used in conjunction with organizational and worker commitment, workplace culture, and training, biomathematical predictive tools provide an exceptional assessment package for worker impairment and fatigue (Nasser & Chowdhury, 2021; Sprajcer, et.al., 2022).

The AlertMeter® and PRISM product proprietary mix of FRMS components (e.g., bio-mathematical models, self-report measures, performance monitoring) have been found to improve critical safety and fatigue key performance metrics (Ferguson, et. al., 2020; Fiscor, 2017; Professional Safety, 2019). A touch-screen application is used to administer a 90-second test that measures cognitive functions such as reaction time, decision making and hand/eye coordination. The AlertMeter® and PRISM tools provide an efficient and accurate system to identify alterness that deviates significantly from an employee's normal results.

Conclusions:

Few studies provide an evidence-base for the effectiveness of FRMS. However, Predictive Safety's AlertMeter® and PRISM products provide a proven technological solution when used in conjunction with established safety management system (SMS) to aid in reducing incidents and mishaps related to fatigue-related factors.

The AlertMeter® prediction tool and PRISM platform provides an exceptional solution to employer concerns regarding efforts to prevent incidents and employee concerns about privacy and safety measures. With biomathematical models that compare employees only to themselves, a greater degree of certainty can be made relative to possible fatigue-related impairment and individualized recommendations.

Management and safety professionals will find that predictive mathematical modeling of fatigue for work scheduling, proactive fatigue monitoring in the workplace, and reactive post-incident follow-up is an excellent adjunct to proactive safety efforts. The goal is to use AlertMeter® and Prism to assist companies to put in place procedures that serve to address fatigue before, during, and after potential fatigue-related incidents.

Opinion:

Based upon a review of AlertMeter and PRISM documents supplied by Predictive Safety, foundational science provided by peer-reviewed literature, and case studies of field use of the AlertMeter predictive modeling tool in conjunction with the PRISM platform, it is my opinion that AlertMeter® and PRISM solution is a sound companion to any company's impairment and/or fatigue-related assessment and mitigation efforts.

References

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