

# **Predicting Safety and Judgment-Related Performance for Operations and Maintenance Employees**

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THE SCIENCE OF PERSONALITY

## Introduction

Hogan recently collaborated with an international diversified mining and materials company to identify personal characteristics associated with safe on-the-job performance and good work-related decision-making in Operation and Maintenance jobs. The goal of this research was to determine whether the Hogan Safety and Advantage reports (both based on the Hogan Personality Inventory; a measure of day-to-day behavioral characteristics) and the Hogan Judgment Report (based on cognitive and non-cognitive factors related to making decisions and receiving feedback) would predict safe job performance and good decision-making in the mining and materials industry.

This local criterion-related validation process consisted of a number of steps. The research study began when incumbent Operations and Maintenance employees, ranging from Managers and Superintendents to Operators and Tradespeople, completed predictor measures included in the research. Specifically, 65 employees completed all sections of the Hogan Judgment Assessment, and 61 employees completed the Hogan Personality Inventory. Next, supervisors rated each of these employees on a 33-question online Performance Rating Form (PRF), providing outcome ratings for 63 Operations and Maintenance employees on 6 questions about overall job performance, 10 items about job-related decision-making, and 10 questions about cognitive ability. Supervisors also had the opportunity to provide open-ended comments about each employee's biggest strengths and biggest challenges related to his/her decision-making at work.

Finally, we combined predictor and outcome data to examine the relationships between the Hogan Safety, Hogan Advantage, and Hogan Judgment scales and outcome ratings for 46 cases of matched data where incumbents completed all predictors and supervisors provided performance ratings. We summarize the findings of these analyses on the following pages.

## Results

### Hogan Safety Assessment Results

Three scales from the Hogan Safety Assessment, which uses the Hogan Personality Inventory (HPI) to evaluate safety-related behaviors, showed consistent and statistically significant relationships with multiple supervisor performance ratings, as did overall safety scores. Individuals scoring as Strong, Cheerful, Trainable, and higher on overall Safety tended to receive higher performance ratings than individuals scoring as Panicky, Irritable, Arrogant, and lower on overall Safety. Tables 1 through 4 below display significant results.

Table 1. Correlations between Panicky – Strong scale scores and Supervisor Performance Ratings

Supervisor Performance Rating Item	Panicky – Strong Scale
Please rate the employee's overall job performance	.35*
This employee exemplifies the values of our organization	.39**
Tends to consider how he/she contributed to mistakes	.31*
Addresses past mistakes	.29*
Learns from his/her past mistakes	.38**
Works hard to fully understand the nature of the situation	.35*
Seeks out and considers alternative decisions	.33*
Makes good decisions under stressful circumstances	.44**

*Note:* N=46; \* Correlation is significant at .05 level; \*\* Correlation is significant at .01 level.

Table 2. Correlations between Irritable – Cheerful scale scores and Supervisor Performance Ratings

Supervisor Performance Rating Item	Irritable – Cheerful Scale
I want new employees to model this employee's work behavior	.29*
This employee exemplifies the values of our organization	.36*
Seeks out coaching from others	.30*
Makes good decisions under ambiguous circumstances	.33*

*Note:* N=46; \* Correlation is significant at .05 level.

Table 3. Correlations between Arrogant – Trainable scale scores and Supervisor Performance Ratings

Supervisor Performance Rating Item	Arrogant – Trainable Scale
Please rate the employee's overall job performance	.33*
Tends to consider how he/she contributed to mistakes	.37*
Addresses past mistakes	.35*
Seeks out coaching from others	.35*

*Note:* N=46; \* Correlation is significant at .05 level.

Table 4. Correlations between overall Safety scores and Supervisor Performance Ratings

Supervisor Performance Rating Item	Overall Safety
This employee exemplifies the values of our organization	.30*
Overall, this employee makes good decisions at work	.33*
Learns from his/her past mistakes	.29*
Seeks out coaching from others	.31*
Makes good decisions under ambiguous circumstances	.29*

*Note:* N=46; \* Correlation is significant at .05 level.

### Hogan Advantage Assessment Results

Two scales from the Hogan Advantage Assessment, which uses the HPI to evaluate general employability, showed consistent and statistically significant relationships with multiple supervisor performance ratings, as did overall employability scores. Specifically, individuals with higher scores on Composure, Customer Focus, and overall Employability tended to receive higher performance ratings than individuals scoring lower on these dimensions. Tables 5 through 7 below display significant results.

Table 5. Correlations between Composure scale scores and Supervisor Performance Ratings

Supervisor Performance Rating Item	Composure Scale
Please rate the employee's overall job performance	.29*
This employee exemplifies the values of our organization	.30*
Seeks out coaching from others	.34*
Makes good decisions under ambiguous circumstances	.34*

*Note:* N=46; \* Correlation is significant at .05 level.

Table 6. Correlations between Customer Focus scale scores and Supervisor Performance Ratings

Supervisor Performance Rating Item	Customer Focus Scale
Please rate the employee's overall job performance	.39**
I want new employees to model this employee's work behavior	.49**
This employee exemplifies the values of our organization	.48**
Overall, this employee makes good decisions at work	.34*
Tends to consider how he/she contributed to mistakes	.34*
Works hard to fully understand the nature of the situation	.30*
Seeks out and considers alternative decisions	.30*
Considers consequences and impact on others before making decisions	.32*
Makes good decisions under ambiguous circumstances	.43**
Makes good decisions under stressful circumstances	.36*

*Note:* N=46; \* Correlation is significant at .05 level; \*\* Correlation is significant at .01 level.

Table 7. Correlations between Overall Employability scores and Supervisor Performance Ratings

Supervisor Performance Rating Item	Overall Employability
Please rate the employee's overall job performance	.31*
This employee exemplifies the values of our organization	.38**
Learns from his/her past mistakes	.34*

*Note:* N=46; \* Correlation is significant at .05 level; \*\* Correlation is significant at .01 level.

### Hogan Judgment Assessment Results

Four scales from the Hogan Judgment Assessment, which evaluates decision-making tendencies, showed consistent and statistically significant relationships with multiple supervisor performance ratings. Individuals scoring as Strategic in their approach to decisions, Cool-Headed or Genuine in their reactions to negative feedback, and generally Receptive to feedback about previously unsuccessful decisions tended to receive higher performance ratings than individuals scoring as Tactical in their approach to decisions, Defensive or Superficial in their reactions to negative feedback, and generally Resistant to feedback. Tables 8 through 11 below display significant results.

Table 8. Correlations between Tactical – Strategic scale scores and Supervisor Performance Ratings

Supervisor Performance Rating Item	Tactical – Strategic Scale
Please rate the employee's overall job performance	.39**
Gathers essential information needed to make decisions	.32*
Makes good decisions under stressful circumstances	.32*
Deals with complex concepts comfortably	.40**

*Note:* N=46; \* Correlation is significant at .05 level; \*\* Correlation is significant at .01 level.

Table 9. Correlations between Defensive – Cool-Headed scale scores and Supervisor Performance Ratings

Supervisor Performance Rating Item	Defensive – Cool-Headed Scale
Please rate the employee's overall job performance	.33*
I want new employees to model this employee's work behavior	.31*
This employee exemplifies the values of our organization	.36*
Seeks out coaching from others	.38**
Makes good decisions under ambiguous circumstances	.33*

*Note:* N=46; \* Correlation is significant at .05 level.

Table 10. Correlations between Superficial – Genuine scale scores and Supervisor Performance Ratings

Supervisor Performance Rating Item	Superficial – Genuine Scale
Please rate the employee’s overall job performance	.30*
Engages in feedback to solve problems	.35*
Organizes and integrates information from across multiple sources	.32*
Seeks out and considers alternative decisions	.32*
Makes good decisions under stressful circumstances	.53**
Deals with complex concepts comfortably	.28*

*Note:* N=46; \* Correlation is significant at .05 level.

Table 11. Correlations between overall Receptiveness to Feedback scores and Supervisor Performance Ratings

Supervisor Performance Rating Item	Overall Receptiveness to Feedback
Overall, this employee makes good decisions at work	.33*
Engages in feedback to solve problems	.30*
Makes good decisions under ambiguous circumstances	.31*
Makes good decisions under stressful circumstances	.43**

*Note:* N=46; \* Correlation is significant at .05 level.

## Summary

Overall, these results provide support for using Hogan solutions to increase safe job performance and job-related decision-making for Operations and Maintenance employees in the mining and materials industry. Specifically, HPI-based solutions (i.e., Hogan Safety Report, Hogan Advantage Report) and the Hogan Judgment Report are associated with a number of supervisory-rated performance outcomes from overall job performance and modeling organizational values to making good decisions under ambiguity and stress. Based on these findings from a limited but valuable sample size, Hogan recommends conducting additional research with the goal of implementing these solutions to help companies in this industry hire job applicants who are likely to perform safely and make good decisions, and develop existing employees to increase self-awareness and performance around safety and decision-making at work.