

CONTRACTOR SAFETY PREQUALIFICATION

The Significant Limitations

By David W. Wilbanks

SAFETY PREQUALIFICATION PRACTICES are increasingly recommended and used for contractor selection with the goal of reducing work site incident risk (Burroughs, 2015; Hannan, 2015). Whether prequalification is facilitated by the hiring organization or a third-party service provider, it is prudent to investigate the criteria commonly adopted. Does the practice actually provide the benefit desired, that is, safer contractors? The author recently examined the popular requirement of submission and review of contractor written safety programs and found the practice wanting (Wilbanks, 2018). Reliance on contractor loss statistics is another deserving discussion.

Contractor injury history may be the most valued safety prequalification criterion; a recent survey of steel industry safety professionals found that more than 75% of respondents considered it to be a very or an extremely important factor when selecting contractors (Wilbanks, 2017; Figure 1).

The same study also found that contractor injury history remained the single most important factor (Kendall's $W = .224$, $p < .05$) after respondents were asked to force rank it along with seven other possible contractor prequalification data points: employee training and certification; capacity to complete the work safely;

liability and regulatory history; related work experience; written safety programs; reputation; and financial stability. Interestingly, the volume of contractor incidents claimed to have been observed by the respondents during their careers did not significantly influence their perception of the importance of evaluating contractor injury history (Spearman rank order correlation test, $r = -.022$), or any of the other data points. Finally, a test was conducted to determine whether significant differences exist between specialists, managers and directors, and the importance of evaluating contractor injury history assigned by them; such differences were found to exist (Kruskal-Wallis H test, $X^2 = 6.648$, $df = 2$, $p < .05$). Inter-

estingly, safety specialists placed greater importance on contractor injury history than did directors (post hoc test, median 6.0 and 5.0, respectively). Yet both groups rated the factor highly, that is, at least 5 on a 7-point scale, with 7 reflecting the greatest importance. Thus, contractor injury history may be considered a gateway prequalification factor (Cauchon, 2014; Inouye, 2015; Philips & Waitzman, 2013; Sparer, Murphy, Taylor, et al., 2013). An unfavorable history may be immediately disqualifying.

Background: Contactor Injury History

The importance given to contractor injury history may be a function of the apparent objectivity afforded by quantifiable data. Commonly requested incident data include self-reported loss rates such as lost time, days away restricted or transferred, total recordable incidents and others (the "Terms and Definitions" sidebar defines key terms). The reported rates are often subsequently compared by hiring organizations or their third-party providers to North American Industry Classification System industry averages to judge contractors' relative performance versus peers.

Philips and Waitzman (2013) reviewed data provided by a third-party contractor safety prequalification service and found that historical lost-time incident rates and experience modification rates (EMRs) were predictive of current performance. However, Manuele (2013) regards loss rates as lagging indicators because their measures are variations of injury and illness frequency and severity calculations. As such, they are analogous to what a rearview mirror reflects; past performance is not prologue, whether judged bad or good. Manuele admits the utility of lagging indicators for confirming trends, but even this value is not guaranteed. Stricoff (2000) describes several factors contributing to erroneous conclusions when considering loss rates even when used to trend data. Rate outcomes must be measured over a long period to be statistically significant, otherwise a rate increase or decrease may simply be a response to random variation and not reflective of significant change in the safety system. But, in terms of injury and illness rates, time is a function of hours worked more than linear time. It is a reality that particularly disadvantages the average contractor.

Practical Limitations to Self-Reported Loss Rates Small Numbers

A small construction contractor with 10 employees and one injury incident would incur a rate of 10.0 assuming a 200,000-hour rate basis and an average hours worked per annum per worker of 2,000 (40 hours per week multiplied by 50 weeks). This

KEY TAKEAWAYS

- Hiring organizations give great weight to injury history when conducting prequalification of prospective contractors. The validity and reliability of this practice are questionable, as the data are lagging, often statistically insignificant and normally not audited.

- Contractors have been known to produce false or underreported data, and overinterpretation of small numbers often undermines the utility of contractor injury rates.

- This article discusses the use of experience modification rate statistics such as injury rates, which presents unique challenges that are not readily solved. The author recommends alternative criteria.

SAFETY N s of Loss Rates

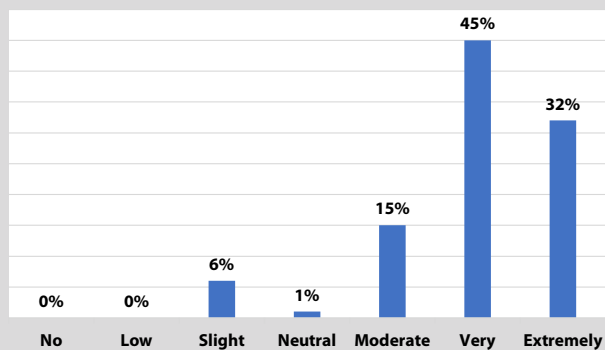


is relevant because while OSHA, for example, does not require injury recordkeeping by all employers with 10 or fewer employees, companies hiring contractors frequently do. Moreover, the average number of full-time workers per establishment in the U.S. over a recent 18-year period was approximately 16, and the average size firm (which could contain multiple establishments) was approximately 22 workers (Choi & Spletzer, 2012).

A single injury for such employers would produce a rate between 4.5 and 6.3. U.S. Bureau of Labor Statistics (BLS, 2016), however, reports the average injury and illness rate per 100 full-time construction workers in 2014 was 3.6. This becomes especially relevant when considering a company subjecting contractors to prequalification using loss rate criteria and employing 100 workers would report a rate of 1.0 for a single injury. That is about five to 10 times lower than the prospective contractors' injury rates, and all prospective contractors exceed the reported national average. Disqualification of all three contractors is likely since each performs worse than the comparison group and far worse than the hiring organization. Table 1 (p. 24) summarizes this example.

FIGURE 1
VALUE OF CONTRACTOR INJURY HISTORY DATA

Proportion of safety professionals rating the importance of evaluating contractor injury history during contractor prequalification.



Note. Adapted from "Safety Prequalification Factors for the Selection of Contractors Within the Steel Industry," by D. Wilbanks, 2017, Dissertation, Indiana University of Pennsylvania, ProQuest.

TERMS & DEFINITIONS

Contractor: A contractor is an independent firm but working at the behest of another firm that exercises overall responsibility for the operations at the work site (Pegula, 2014).

Contractor injury history: Injury statistics reported to prospective hiring organizations by contractors or other parties on the contractor's behalf. This can include frequency and severity rates, experience modification rates and other loss indices.

Contractor safety prequalification: A "pre-tender process used to investigate and assess the capabilities of contractors to carry out a contract satisfactorily if it is awarded to them" (Hatush & Skitmore, 1997; Truitt, 2012).

Days away, restricted or transferred (DART): Nonfatal workplace injuries and illnesses requiring recuperation away from work, transfer to another job, restricted duties at work or a combination of these actions (BLS, 2005).

Experience modification rate (EMR): An organization's actual claims history over a 3-year period, excluding the last 21 months, versus insurance industry predictions (Brahmasrene & Smith, 2008).

Hiring organization: A public or private company, corporation, firm, enterprise, authority or institution, or part or combination thereof, whether incorporated or not, that has its own management functions, consisting of one or many facilities that hires contractors for the performance of workplace projects or tasks. Adapted from definition for *organization* provided by ANSI/ASSP Z10 (2017).

Incident rate calculation: An incident rate is a measure of frequency (OSHA, 2019) representing the number of injuries and illnesses occurring within a base population (usually 100 full-time workers) over a given period (usually 1 year). Formula: (number of injuries and illnesses x 200,000)/employee hours worked = incident rate.

Multiple rate examples include: Lost-time accident (LTA) rate; DART rate; and total recordable incident (TRI) rate.

Lost-time accident (LTA): A workplace injury or illness that involves 1 or more days away from work (OSHA, 2001).

Note. Adapted from "Safety Prequalification Factors for the Selection of Contractors Within the Steel Industry," by D. Wilbanks, 2017, pp. 20-23. Dissertation, Indiana University of Pennsylvania, ProQuest.

TABLE 1

COMPARISON OF HYPOTHETICAL CONTRACTOR INJURY & ILLNESS RATES

| Employer | No. employees | No. injuries or illnesses | Expected hours worked* | Incident rate** |
|--|---------------|---------------------------|------------------------|-----------------|
| Contractor A | 10 | 1 | 20,000 | 10.0 |
| Contractor B | 16 | 1 | 32,000 | 6.3 |
| Contractor C | 22 | 1 | 44,000 | 4.5 |
| National average: Construction workers | | | | 3.6 |
| Hiring organization | 100 | 1 | 200,000 | 1.0 |

Note. *2,000 used as an average for hours worked per employee per year. **Calculated using 200,000 as the rate basis.

analysis. Were this untrue, any consideration given to granting variances when specified contractor injury and illness limits are exceeded would be unjustifiable.

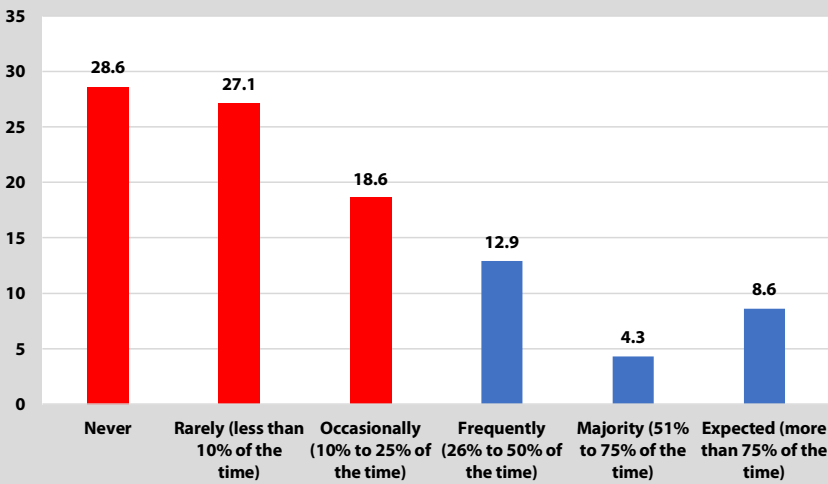
Underreporting

Kozlovska and Strukova (2012) express concern that hiring organizations' preoccupation with loss history measures may disadvantage the contractor that endeavors to faithfully report workplace incidents, while providing advantage to less conscientious contractors. Contractor concerns about the injury rate criteria being viewed as unfair and arbitrary increase with the emphasis given them (Stricoff, 2000). As a consequence, "people learn how to make the numbers 'come out right,'" as there is little incentive to fully disclose all incidents (Ng, Cheng & Skitmore, 2005). Philips and Waitzman (2013) say, "competition not only begets improvement, it stimulates cheating." In their study of 38 contractor companies, Probst, Brubaker and Barsotti (2008) observed an average of 3.11 injuries per 100 workers were officially recorded in the respective OSHA injury and illness logs. However, a detailed audit of workers' compensation medical claims records revealed a rate of 10.9 injuries was accurate. Other studies have identified documented cases of fraudulent injury reporting within contractor organizations (Gochfeld & Mohr, 2007; Wilbanks, 2016). Among the few benefits that prospective contractors gain by submitting incomplete or inaccurate data to hiring organizations is an improved possibility of winning work or, specifically, the promise of not being excluded from it. For some, this has proven reason enough.

FIGURE 2

PERCENTAGE OF TIME AUDITS CONDUCTED

Percentage of the time that loss statistics are audited at the contractor's physical workplace by steel industry safety professionals or by others on their behalf.



Note. Adapted from "Safety Prequalification Factors for the Selection of Contractors Within the Steel Industry," by D. Wilbanks, 2017, Dissertation, Indiana University of Pennsylvania, ProQuest.

The safety professional tasked with establishing contractor safety prequalification criteria can simultaneously make two reasoned arguments. The first is that it is illogical to accept performance from a prospective contractor that is worse than the national average. The second is that it is illogical to reject a contractor for a single perhaps benign event. Such an event could include a foreign body in the eye at a windy, dusty work site even though sealed eyewear was worn and properly donned. Another could be a lost-time incident from a trip-and-fall event occurring on a sunny day where dry conditions, proper footwear, a sidewalk in good repair and no substandard acts were evident. In these examples, the clearly drawn lines meant to separate the wheat from the chaff routinely give way to practical reality. Hiring organizations grant variances to prospective contractors to get themselves out of the corner they have painted themselves into. This convention is equivalent to looking the other way. It can also be capricious, or at least subject to the individual decision-maker's judgment rooted in personal experience that cannot likely be reliably repeated by others, or even by the original decision-maker.

Regardless of circumstance or severity, injury and illness rates for contractor populations are often statistically insignificant due to the limited time (hours worked) represented. The consequence is that the resulting data is invalid for meaningful comparative

Consider the case of Pacific Gas and Electric Co.'s (PG&E's) selection of Cleveland Wrecking Co., an employee of whose was killed during the demolition of a power plant (Cox, 2014). Cleveland Wrecking did not faithfully disclose its injury incident history, which was subsequently found through independent investigation to be greater than any of the other four competing bidders. This provided the company with an undue advantage when the hiring organization compared bidders' scorecards. PG&E's prequalification process may be judged to be without practical worth, perhaps due to its lack of rigor in evaluating contractor loss history. Safety professionals responsible for contractor safety prequalification should grow circumspect about the importance given to self-reported incident rates. As the following discussion makes clear, PG&E is not alone.

Lack of Audit

Note that prospective contractors self-report injury and illness rates other than EMRs (Yemenu & McCartin, 2011) and these are often taken at face value without meaningful verification. This observation is supported by recent research in which safety professionals were asked the percentage of the time that audits are conducted at the contractor's physical workplace by the safety professionals, or by others on their or their organization's behalf, to verify the accuracy of submitted injury or other loss statistics (Wilbanks, 2017;

TABLE 2
EMR SHORTCOMINGS

| Authors | Criticism |
|--|---|
| 1) Everett and Thompson (1995) | <ul style="list-style-type: none"> • The EMR is a complex approach. • The EMR cannot fairly compare the safety records of different contractors. • New contractors are forced to pay higher premiums since they are not experience-rated. |
| 2) Hinze, Bren and Piepho (1995) | <ul style="list-style-type: none"> • The EMR value is decreased as the project size is increased. • Highly paying contractors will have lower EMR values. |
| 3) Coble and Sims (1996) | <ul style="list-style-type: none"> • The EMR can be vulnerable to fraud by contractors to obtain low premiums in three ways: <ol style="list-style-type: none"> 1) manipulating the payroll of workers; 2) misrepresenting work classification; 3) manipulating company ownership. |
| 4) Hoonakker, Loushine, Carayon, et al. (2005) | <ul style="list-style-type: none"> • The EMR is a lagging indicator. • The EMR is based on worker classification and not on jobs, which impedes interpretation of results. |

Note. Adapted from "An Expert System for Strategic Control of Accidents and Insurers' Risks in Building Construction Projects," by K. Imriyas, 2009, *Expert Systems With Applications*, 36(2), pp. 4021-4034.

Figure 2). Respondents believed such audits were not normally carried out approximately 75% of the time; 12.5% of the total respondents were unable to judge the question at all.

Third-Party Services

Contrary to possible general perception, third-party contractor qualification service providers do not typically verify the validity of contractor self-reported data. Rather, the industry practice is generally to confirm that requisite forms (e.g., OSHA Form 301) are submitted and are void of form or manner errors such as data field omission, undated or missing required signatures (W. Robinson, Browz, personal communication, March 11, 2016; K. Vickers, ISN, personal communication, May 28, 2015; K. Reeves, PEC, personal communication, March 11, 2016). This subtle but important nuance should be considered when the word *verify* is encountered within third-party prequalification service literature. In fairness, third-party providers would likely deliver a commensurate service if hiring organizations were willing to accept the costs of a statistically significant audit. The rarity of audits, whether by third-party providers or hiring organizations, may be because of increased transaction costs (Waar & Bröchner, 2006). Few organizations are apparently willing to accept the increased cost required to conduct audits to verify with confidence the validity of self-reported loss data.

EMR: A Preferred Alternative?

EMRs available through National Council on Compensation Insurance (NCCI, 2017) are considered an important alternative to self-reported loss rates because they are calculated using the most recent 3-year loss experience data. This is also because EMRs are independently calculated and reported comparing the insured to its peers. But Brahmasrene and Smith (2008) note that EMRs, too, are subject to interpretation foibles. Less-severe/more-frequent injury claim histories result in greater deterioration of an entity's EMR than less-frequent/more-severe injury claims; it is a counterintuitive reality. Also, EMR calculations favor companies with greater revenue over those with lower revenue, although no difference in safety efforts or results may be in evidence. Imriyas (2009) provides a concise summary of EMR shortcomings (Table 2).

Clayton (2016) makes clear that despite the significant benefits afforded by the EMR metric, its additional limitations include reliability. Only 35 states have adopted NCCI's rating system. The remaining are either independent bureau or monopolistic states. These include California, New York, Pennsylvania, Ohio, North Carolina, Washington and Michigan: not a small portion of the country. Clayton says, "The NCCI EMR offers an interstate rating that is only standardized for a portion of the country." This means that an EMR for a contractor that has multistate operations must be interpreted with the unique knowledge specific to the relevant states' calculation methodologies. These differences cannot be counted on to be insignificant. Clayton further notes, for example, that 18 states do not allow for experience rating adjustment (ERA). ERA discounts 70% of medical-only claims to encourage full claim submissions and to reward severity reduction efforts by insureds. All EMRs are not created equal and factually can be derived following significantly dissimilar calculation methods. And because EMRs do not provide a nationwide

(U.S.) solution, an EMR-based paradigm cannot aid hiring organizations and their contractors that operate outside its borders. In sum, EMRs are neither an international nor a national norm.

Conclusion

Workplace injury and illness data, however formulated, provides a small and perhaps clouded window through which to view a prospective contractor's expected safety performance. The utility of self-reported data depends largely on the honesty of the contractor, relegating its legitimacy to the honor system. Some will cheat and others will simply misstate data out of ignorance, misjudgment or human error. The scrupulous and meticulous are disadvantaged; the unscrupulous or careless are advantaged. A certified public accountant, for example, would be skeptical of self-reported financial information not subject to audit and would likely find the practice peculiar in any other context, including contractor safety prequalification. Likewise, pharmaceutical companies aspiring to promote new drugs for novel uses would never be permitted by the U.S. Food and Drug Administration to do so based on self-reported, unaudited data. Such would be regarded as reckless and harmful to the common good. Yet, self-reported loss data curiously remain coveted by hiring organizations when prequalifying contractors. Given the observations noted in this article, less and less of an excuse exists to rationalize continuing the tradition.

The author recommends that safety professionals disregard current and prospective contractors' self-reported loss statistics. If loss data are demanded, they should be used only when independently calculated and reported, or otherwise meaningfully audited. Remember that contractor safety prequalification is intended to introduce objective facts for comparison to established norms so that discriminant choices can be derived. Just as travelers cannot successfully navigate by a roving true-north, safety professionals or the organizations served cannot reliably navigate using contractor self-reported loss statistics.

This conclusion does not indict the integrity of contractors or their hiring organizations but, rather, is based on the reality that the data provided are not valid for the intended purpose. This is because they are frequently not statistically significant and are not (and perhaps cannot practically be) verified with efficacy.

The most compelling and, perhaps, underutilized alternatives are to verify contractor (Inouye, 2015; Wilbanks, 2017):

- employee training and certification: Documented education, training and experience demonstrating the competence of those performing tasks;
- related work experience: Minimally comprised of contractor's technical expertise; knowledge of regulations; time in the field, including the number of years working on similar projects; total and average work volume on similar projects; and working in similar geographical and weather conditions (Doloi, 2009; Mahdi, Riley, Fereig, et al., 2002);
- liability and regulatory history: The prospective contractor's recent history of regulatory compliance violations and investigations, in addition to litigation history in which the prospective contractor is either the litigant or defendant;
- capacity to complete the work safely: The current position of the contractor to perform the proposed project and broadly includes management ability, adaptability and coordination, and current resources and workloads (Mahdi, et. al, 2002);
- pretask/prejob planning: Method used to identify and assess the risk of the work to be done, and to ensure that adequate control measures are implemented before work activity is begun;
- monitoring: "Periodic assessments during the contract term, which varies from daily checklists and/or safety talks to weekly walkthroughs, monthly and yearly assessment" (Inouye, 2005);
- postjob evaluations: Structured, objective methods to assess a contractor's satisfactory completion of work (e.g., safely, on-time, required quality standards met, on time) as a primary input for considering the contractor for subsequent work. **PSJ**

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