

## **Safety Professionals' Role in Preventing Construction Safety Contract Issues**

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### **Introduction**

Construction worker safety and health continues to be a major concern for the construction industry. Past research studies have found that including safety requirements in contracts could improve project safety performance (Hinze 1997; Gambatese 2000, and Huang 2003). At the same time, failure to include certain safety requirements in construction contracts can lead to disputes. Contracts are essential to the construction process. In the simplest of terms, a contract may be defined as an agreement between two or more parties that is enforceable by law. A more complete definition would also address the desirability of using a written format, the necessity of an offer and an acceptance, an exchange of consideration, and a requirement for competent parties (Rajendran et al. 2013).

Many construction practitioners see the contract as a legal reference document to be pulled out only when there is a dispute. However, it is the authors' opinion that the use of the contract as a planning tool can prevent some disputes on a construction project. Contract disputes can be associated with any or all of four major aspects of a construction project: cost, quality, schedule, and safety. A recent study found that contract disputes can be attributed to safety management (Rajendran et al. 2013).

The construction industry employs thousands of safety professionals with the majority working for contractors - general contractors or subcontractors. Construction safety professionals, whether representing owners or contractors, can play a significant role in preventing contract disputes related to safety management by making sure that specific clauses related to safety issues are incorporated into the contract before it is signed by the two parties (Rajendran et al. 2013). However, current literature does not reveal the safety professionals' level of participation in contract writing process, and it does provide evidence whether their involvement can reduce

contract disputes. The primary objective of this paper is to determine the construction safety professionals' current level of involvement in contract writing as it pertains to safety and management and its impact on contract disputes. In addition, the paper provides real-world examples/case studies of contract safety issues experience by construction safety professionals, and how they resolved those issues. Finally, the paper provides recommendations and best practices on how safety professionals can help construction project management to avoid contract disputes.

## Methods

The authors used data from two sources to meet the paper's objectives: (1) historical data from a questionnaire survey response from 47 construction safety professionals and project managers that identified the various contract issues associated with construction safety management (Rajendran et al. 2013), and (2) qualitative data from seven construction safety expert interviews. The construction safety professionals who participated in the survey and the interviews were from the northwestern U.S.; hence the results cannot be generalized to the entire U.S. construction industry. The authors recommend further study with a larger, more diverse population from across the country to address this limitation. Furthermore, the small survey (n=47) and interview (n=5) sample size limits the ability to generalize the results to the entire construction industry. The authors recommend further study with a larger number of projects and firms to address this limitation and achieve statistical validity. However, the recommendations listed in this paper are a good start to address this issue.

### Survey

Rajendran et al. 2013 used a questionnaire survey, to identify the common contract issues associated with construction safety management, and to investigate the frequency and severity of contract issues relative to safety management. The survey also requested data on the level of involvement of safety professionals in contract writing, which was not used in Rajendran et al. 2013. The aforementioned data along with the contract frequency and severity data was used in this paper to identify the construction safety professionals' level of involvement in contract writing and its impact on contract disputes. The survey questions whose responses from Rajendran et al. 2013, included in this paper are:

1. What is the level of involvement of your safety professionals in contract writing as it pertains to safety and health issues on a Likert-type scale of 1 to 5 as follows: "very little" (1), "little" (2), "moderate" (3), "high" (4), or "very high" (5)?
2. What percentage of your company's contract disputes can be attributed to safety issues?
3. How much time (%) does your company spend annually resolving contract issues pertaining to safety related areas?
4. How much cost (%) does your company incur annually resolving contract issues pertaining to safety related areas?

### Expert Interviews

In order to meet the secondary objectives of the paper, a qualitative approach was followed to obtain real world examples of construction safety contract issues, and strategies used to solve them. Construction safety expert interviews were also used to identify the construction safety professionals' role in preventing construction safety contract issues. Based on literature, in order

to qualify as an expert, persons must meet five criteria: (a) minimum of 10 years construction safety management experience, (b) minimum of 10 years of construction contract experience, (c) safety related degree, (d) at least one construction safety related certification such as CSP, CIH, or CHST, and (e) member of a professional safety association such as American Society of Safety Engineers. The authors interviewed seven experts with a total construction safety experience of 114 years and combined total construction contract experience of 146 years.

The authors used a written open-ended interview to provide an opportunity for the experts to share their experience and to put forth their thoughts on this issue. The following questions were addressed in the interviews:

1. Within your company, rate your level of participation in contract writing as it pertains to safety and health management on a Likert-type scale of 1 to 5 as follows: “very little” (1), “little” (2), “moderate” (3), “high” (4), or “very high” (5).
2. What is your perception on the impact of the safety professional’s involvement in preventing safety contract issues?
3. Please provide an example or case study of a contract safety issue you were involved in the last five years? How serious was this issue in terms of dollar and schedule impact? Explain how you resolved this contract issue? Please provide pictures or any graphics that will explain this issue.
4. Based on your experience, please list the different ways (best practices) safety professionals can collaborate with project management to avoid contract issues?

## Results and Discussions

### Safety Professionals and Contract Writing

Information regarding safety professional’s involvement with contract writing was solicited using the question, “What is the level of involvement of your safety professionals in contract writing as it pertains to safety and health issues on a Likert-type scale of 1 to 5 as follows: “very little” (1), “little” (2), “moderate” (3), “high” (4), or “very high” (5)?” The responses are reported in Table 1. Thirty eight respondents (81%) indicated that their involvement in contract writing ranged from moderate to very little. However, 19% of the respondents stated that they were highly involved with contract writing pertaining to safety management.

<b>Involvement in Contract Writing</b>	<b>Response (N=47)</b>	<b>Percentage</b>
Very Little	13	28%
Little	12	26%
Moderate	13	28%
High	3	6%
Very High	6	13%
<b>Total</b>	<b>47</b>	<b>100%</b>

**Table 1. Safety Professionals’ Involvement in Contract Writing**

Contract issue frequency and severity was assessed using three questions as previously noted. One survey question solicited information about the *percentage* of their company’s contract disputes attributed to safety management issues. These responses ranged from 0% to

25%. Another question requested information about how much *time* did their company spend resolving contract issues related to safety management issues per year. For example, if a company spent 1,000 hours on overall construction contract disputes, and safety issues contributed totaled 100 hrs, then the response would be 10%. The time spent ranged from 0 to 25%. The third question asked how much *cost* did their company incur annually resolving contract issues pertaining to safety management issues per annum. The total cost incurred ranged from 0 to 25%.

A simple analysis was conducted to examine the relationship between safety professional’s “level of involvement” and “frequency and/or severity” of contract disputes/issues associated with the respondent’s firms. The level of involvement categories such as “very little,” “little,” and “moderate” were included into one group, and “high” & “very high” were included in the second group. The corresponding contract disputes average frequency and severity data were calculated and tabulated in Table 2.

Safety professional’s involvement in contract writing would be considered to have a positive impact if the frequency and severity of contract issues decreased in firms, as the level of safety professional’s involvement increased. The authors compared the two groups of safety professionals as noted above, and it was found that firms at which the safety professionals involvement were higher with contract writing pertaining to safety management, the lower the frequency and severity of contract disputes/issues (Table 2). It should be noted that a statistical analysis was not performed due to the small sample size. The authors recommend further study with a larger number of projects and firms to address this limitation and achieve statistical validity. However, this simple analysis could be a good starting to explain the importance of safety professionals being involved in contract writing.

Safety Professionals Involvement in Contract Writing	Contract Issues Pertaining to Safety Management					
	Frequency (Proportion%)	N	Severity (Time%)	N	Severity (Cost%)	N
Very Little to Moderate	3.39	30	2.19	29	2.18	27
High to Very High	1.51	8	1.51	8	1.73	7

**Table 2. Comparison of Safety Professionals Involvement in Contracts Writing and Contract Issues Severity/Frequency**

Safety Professionals and Contract Writing – Expert Perception

In addition to the objective data presented above, an expert interview question elicited their perception on current level of involvement in contract writing and the impact of the safety professional’s involvement in preventing safety contract issues. All the seven experts agreed that the safety professionals can have a positive impact in reducing contract safety issues. Some of the responses are summarized below:

- Their involvement is very little, especially in smaller firms compared to large corporations. I definitely feel safety professional’s involvement in contract writing as it pertains to the safety section will have a huge impact in reducing contract issues.

- Safety professionals should be highly involved; however, currently most of them are not involved with contract writing as it pertains to safety management.
- Safety professional's impact on resolving contract issues depends on the project manager, owner requirements, superintendent, and when they are being brought into the project, i.e. before or after contracts are issued.
- Safety professional's involvement in contract writing is overall very lacking.
- Very few forward thinkers working ahead during the early phase of a project to include safety provisions in contracts to avoid disputes later down the road.
- Very little involvement, since the majority of the time the safety professionals are brought onboard after the project groundbreaking. Once the contract is executed safety professionals have very little control and have to live with the contract and deal with disputes later.
- Their involvement is lacking. Positive impact for sure.

#### Contract Disputes Examples – Expert Experience

The author's objective was to collect examples of contract issues experienced by the experts, and how they resolved them. In order to protect the confidentiality, anonymity, and propriety nature of the data shared by the experts, the authors have just listed bullet items of examples shared by the experts in this paper. The authors will expand on these items during the presentation at the ASSE 2013, or interested readers can contact the authors to obtain more information regarding these examples. The authors also recommend the readers to refer Rajendran et al. 2013 to obtain a comprehensive list of contract issues that should be included in the contracts/subcontracts. Some of the main areas of contract issues:

- Drug and Alcohol testing requirements.
- Multi-trade work area access.
- Requirement of training documentation.
- Six feed fall protection for all trades.
- 100% safety glass requirement.
- High visibility vest requirement.
- Safety professional requirement based on the number of employees.
- Energized electrical work requirement.
- Subcontractor corrective action plan requirement.
- Job Hazard Analysis requirement.
- Project management involvement with site inspection/safety meeting requirement.
- Crane critical lift threshold.
- Meeting requirements, and
- Ladder requirement.

#### Safety Professionals can Reduce Contract Issues

There are a number of ways that safety professionals can help greatly reduce the number of contract issues associated with safety management. Based on construction safety expert interviews, the author's professional experience, and literature review (Rajendran et al. 2013), some of the primary strategies are:

1. Owner safety professionals should clearly communicate their safety expectations for the project, so contractors can allocate resources appropriately in the bid. Construction safety

professionals should ensure they clearly understand the owner's Environmental, Health, and Safety (EHS) requirements, as well as their own.

2. Owner safety professionals should create a list of their EHS requirements that are above and beyond OSHA requirements. They should communicate these requirements with their contractors through the contracts.
3. Contractor safety professionals should be involved with their marketing departments early in the project procurement process to avoid commitment of unrealistic or unnecessary safety resource levels in an attempt to receive an award of a project.
4. Contractor safety professionals should become an active participant in the project procurement process as early as possible, preferably as early as the Request for Proposal (RFP)/Invitation to Bid stage.
5. Contractor safety professionals should be involved early-on in the project to familiarize themselves with the project scope, design, and all requirements pertaining to the project delivery process.
6. Contractor/subcontractor safety professionals should take an active role in the pre-bid meetings and communications that take place. Similar to owner safety representative, contractor safety professionals, should create and share a list of Owner and Contractor EHS requirements that are above and beyond OSHA requirements, and make it part of the subcontracts.
7. Safety professionals should continue their involvement in the early stages of the project by actively participating in pre-award meetings, reiterating the owner and contractor EHS requirements that are above and beyond OSHA requirements.
8. Safety professionals should ensure that appropriate contractual requirements and responsibility assignment clauses are included in the final contract.
9. Continued active participation by the safety professional must continue into and through the mobilization meetings phase of bringing a new project online.
10. Safety professionals should require a site specific safety plan before the contract award to review plan, and ensure the contractors have understood the site specific safety requirements.
11. Safety professionals should thoroughly review the contracts/subcontracts before the final contract is issued or executed, to ensure the inclusion of specific EHS requirements.
12. If safety professionals identify any contract issues during the construction phase, even though it is too late, they have to try to resolve them as soon as possible to avoid impacting project safety, cost, quality, and/or schedule.
13. Safety professionals representing various construction players can have one-on-one meetings to understand the EHS requirements of the project early-on with the project delivery process. Any challenges to implement and practice certain requirements can be discussed and brought up with their project management.
14. Within a contractor organization, safety professionals should ensure consistent EHS terms and conditions between all project managers and job sites. This strategy will avoid confusion among subcontractors working for the same contractor organization, but at different projects, under different project managers.
15. Safety professionals should also establish and maintain a trusting relationship with the procurement and project management team, to ensure important EHS contract requirements are not removed from the contracts for cost reasons.
16. Overall, safety professionals associated with construction should develop and maintain a contract EHS issues database (Rajendran et al. 2013) specific to each trade. This list could possibly serve as a reference document to contract managers and safety professionals when

writing the safety sections of construction contracts for each trade. Using this list may reduce disputes with respect to safety issues during construction operations.

## Conclusions

1. Safety professionals' involvement with contract writing as it pertains to safety management is generally lacking in the construction industry.
2. Based on a simple analysis presented in the paper, safety professionals' involvement in contract writing might reduce contract disputes/issues pertaining to safety management. Hence, safety professionals have a significant role in preventing contract issues associated with safety management.
3. Construction safety professionals should be involved during the project proposal phase, contract management phase, pre-award & pre-mobilization meetings; to ensure safety management expectations are clearly identified and communicated to help reduce the possibility of safety management related claims.

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