UNDERSTANDING THE ROLE OF LOCAL SAFETY GROUPS IN MANAGING SAFETY PRACTICES BETWEEN MICRO CONSTRUCTION FIRMS AND PRINCIPAL CONTRACTORS

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Construction projects incorporate the input of a range of tradesmen and different sized firms, ranging from micro to large organisations. Working practices of micro construction firms are carried out in an informal manner while larger organisations tend to adopt more formal on-site management techniques. Many micro firms seek to develop long-term relationships with large principal contractors and a major strain on their relationships stem from the difference in safety management techniques they employ. Faced with a fundamental shift in their style of safety management, workers of micro construction firms must successfully negotiate this challenge. Against this background, records from the Health and Safety Executives show year on year reductions in accident and incident rates in the East Midlands, an indication that the safety practices on projects are being implemented more effectively. Some of this success has been attributed to the efforts of local safety groups, such as Nottinghamshire Occupational Safety and Health Association (NOSHA). As such, it is important that the interdependencies between large principal contractors and micro firms, and the role that safety groups such as NOSHA play in managing this relationship are better understood. This paper presents interviews conducted with some members of NOSHA. This is the first of two phases of empirical work. The roles that the members of the local safety group perform have been found to go beyond simply promoting safety awareness and safety knowledge on site. They have been found to help in conflict resolution among the various construction parties. Such practices help create a harmonious working environment and subsequently lead to long-term working relations.

Keywords: micro firm, informal practice, subcontractors, safety group.

INTRODUCTION

The need for improvement in safety practices and safety cultures on construction sites will always exist as long as the well-being of workers is at stake in the industry. Essentially, every construction firm, whether large, medium, small or micro receives encouragement from policy makers and other practitioners in the industry to create and maintain a positive safety culture on site (Langford *et al*, 2000).

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Aboagye-Nimo, E, Raiden, A and King, A (2014) Understanding the role of local safety groups in managing safety practices between micro construction firms and principal contractors *In:* Raiden, A B and Aboagye-Nimo, E (Eds) *Procs 30th Annual ARCOM Conference*, 1-3 September 2014, Portsmouth, UK, Association of Researchers in Construction Management, 381-390.

This paper focuses on micro construction firms working as subcontractors on large projects, thus forming part of the project supply chain. Micro firms are businesses employing less than ten workers (European Union, 2003).

The safety cultures of principal contractors (usually large firms) are different from those of the micro firms (Yapp and Fairman, 2006: 45). The approaches to safety can be broadly categorized as either formal (official procedures and policies) or informal (influenced by culture) (Hinze and Gambatese 1996: 161). Micro firms belong to the latter (Koch 2013: 699). When micro firms operate on large projects, they are forced to change their working practices as they are legally required to follow the rules and regulations set by the principal contractor (Joyce, 2007). In order to prevent disagreements between principal contractors and subcontractors, some principal contractors use safety consultants who help maintain the goals and objectives of the project without compromising safety. Safety Groups UK, a nationwide group dedicated to promoting awareness and safety knowledge, has numerous branches and affiliates helping projects in different areas of the country (Safety Groups UK, 2014). In Nottinghamshire, the group is represented by Nottinghamshire Occupational Safety and Health Association (NOSHA). This project looks at how members of NOSHA help micro firms when they are operating on large projects as subcontractors.

In this paper is a model labelled as the 'Pybus curve' will be used to study safety cultures of construction firms and the evolutionary stages that safety culture is known to go through. A literature review on site safety management is presented, whereby the relationship between main contractors and subcontractors is discussed. This is followed by a section on the research methods adopted for the study. Findings and analysis of fieldwork is then presented and discussed with literature.

THE 'PYBUS' CURVE

The Pybus curve is a model that shows three evolutionary stages of the safety culture of construction firms (Pybus 1996: 18). The Pybus curve has been adopted as a major theory for studying safety cultures and safety management among construction firms by renowned researchers in the field (see Finneran and Gibb, 2013; Lingard and Rowlinson, 2005; Pybus, 1996). Figure 1 shows the stages of change in safety culture.

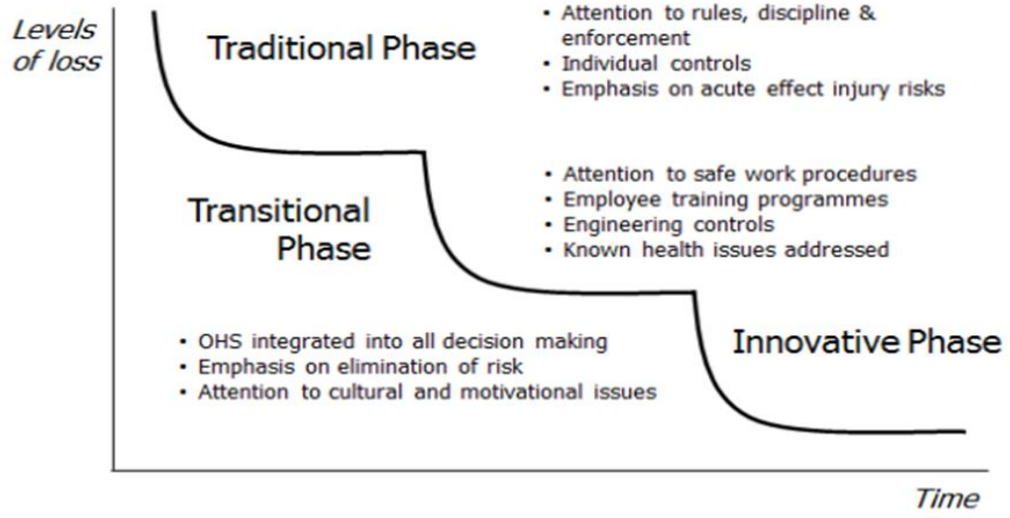

Figure 1: The 'Pybus' curve – Stages in the evolution of a culture of safety (Pybus, 1996: 18)

As illustrated by the Pybus curve, the evolution of a culture of safety occurs in three conceptually distinct stages, namely: the traditional, transitional and innovative

phases. These different phases start from a point in time where losses through injuries and ill-health are at the highest. The traditional approach to health and safety is essentially reactive, as hazards are dealt with as they arise and there is a strong emphasis on discipline and tactics such as enforcing the use of personal protective equipment (ppe) (Finneran and Gibb 2013: 6). At the transitional phase, there is a more proactive approach to managing hazards. Procedures are established in an attempt to prevent injuries and accidents (Lingard and Rowlinson, 2005). The innovative phase on the other hand, fully integrates health and safety into all business making decisions, and every attempt is made to eliminate hazards or minimize workplace risks using technological solutions (Finneran and Gibb 2013: 6). Lingard and Rowlinson (2005) suggest that small construction firms fall into the category of firms in the traditional phase. However, this postulation may not be applicable as relatively small businesses (especially micro construction firms) have been known to use informal approaches (see Marlow *et al*, 2010), thus using less formal rules, and discipline and enforcement of policies as shown in the figure 1. Micro firms and large firms will fall into different sections of the Pybus curve due to their different safety cultures and safety practices (Finneran and Gibb 2003: 11). At best, there may be a combination of the different cultures operating on site, that is, if the large firms' rules and policies do not completely overrule the practices of the other contractors as prescribed in the Construction Design Management (CDM) Regulations.

The next section covers site safety management and how parties interact on site.

SAFETY MANAGEMENT ON CONSTRUCTION SITES

In the UK, safety matters on construction sites fall under the jurisdiction of the Health and Safety at Work etc Act (HASAW) 1974. The Health and Safety at Work Act 1974 states that designers and manufacturers of a given project must demonstrate reasonably practicable effort in identifying and eliminating risks. Reasonably practicable in the context of the act refers to the weighing of a risk against the trouble, time and money needed to control it (HASAW, 1974). Besides this act, there are also the CDM Regulations 2007 which are more specific to the construction industry and lay out specific roles and responsibilities for all parties involved in a construction project. In addition to the legal requirements, large construction companies have their own systematic approaches to safety management within their organisations and on their sites (Sherratt *et al* 2013: 624). The CDM Regulations 2007 states that safety policies and procedures of the principal contractors 'trumps' the working practices of the subcontractors (for example, the micro firms carrying out specialist tasks on site) (Joyce, 2007). In other words; policies of the principal contractors, who often happen to be large companies, supersede those of the subcontractors (which may include micro firms). This rule makes the difference in safety management approaches between the large and micro construction firms even more prominent as one party is forced to adapt their working practices.

Large construction firms tend to have several management layers, along with several departments and perhaps regional offices, and for this reason a firm ordinarily has formalised policies and procedures to cover its large number of workers (Hinze and Gambatese, 1996). On the other hand, smaller companies and micro firms where the owner, superintendent, foreman and lead carpenter can all be one in the same person, can likely do fine by following proper safety arrangements even though the arrangements may be informal (ibid). Small firms and projects do not require the types of procedures and practices required by large organisations as long as the firm’s

operatives incorporate measures that will ensure safe working conditions (HSE, 2010) and this is reflected in the difference in safety cultures. As such, it is understandable how there can be a conflict of ideas when micro firms have to operate on large projects whereby they have to follow the formalised policies of the larger companies. Managing this difference can become problematic when the different cultures clash.

Integration of parties on site

Large construction projects often involve numerous activities on site. Construction supply chains on larger projects typically involve hundreds of different companies supplying materials, components and wide range of construction services (Dainty *et al*, 2001). Integrating the supply chains on site can become problematic if not carried out properly (Briscoe and Dainty, 2005). Partnering arrangements have been successfully carried out between clients and main contractors rather than extending down the chain to subcontractors and suppliers (Ochieng and Price, 2010). Briscoe and Dainty (2005) notice an improving trend in integration in partnering practices and this development includes subcontractors. However, there are still some difficulties facing smaller firms including micro firms who attempt to play a fuller role in the integrated supply chain (Manu *et al*, 2013).

In their study, Briscoe and Dainty (2005) found the following as the key attributes deemed to be the most important for a successful integration of the construction parties:

6. Managing communication
7. Managing information
8. Mechanisms for problem resolution
9. Engineering added value in projects
10. Alignment of supply chain systems
11. Ensuring high quality standards
12. Securing commitment to the client and project objectives
13. Establishing long-term supply chain relations

Whilst the above list is not in order of significance, some of the attributes can be grouped together as they fall within the same area. For example, managing communication, managing information, and mechanisms for problem resolution, can all be placed under a common theme of effective communication. Furthermore engineering added value in projects, alignment of supply chain systems, and ensuring high quality standards, can be labelled as quality assurance. And finally, securing commitment to the client and project objectives and establishing long-term supply chain relations, termed as establishing loyalty and long-term relations.

Briscoe *et al* (2001) explain that external experts can be used by contractors on site to help improve the management of matters. Some of these matters may include legal issues, safety issues, and other specific project requirements. The use of external individuals or parties is a step in the right direction as it has been found that some workers of micro construction firms at times want to voice out certain concerns on projects but are unable do so out of fear of unwanted repercussions (British Chambers of Commerce, 1995). Smaller businesses including micro construction firms may have concerns about the existing regulations put in place by principal contractors as they may find some of them complex, time consuming and even sometimes ineffective, but feel they are unable to raise these issues in fear of being 'marginalized' and subsequently being blacklisted by major contractors (Taylor, 2013). This 'paranoia'

may be at an all-time high with recent revelations suggesting that blacklists do indeed exist in the UK construction industry and have been used to reject several companies from attaining contracts (BBC News, 2013). Local safety groups have been operating in various regions of the country to promote awareness and knowledge about work-related health and safety risks and how to manage them (Safety Groups UK, 2014). Furthermore, through their consultants who visit sites, they create a harmonious existence between the different parties on site on issues relating to safety. They do so by bringing a wide range of people together to hear essential messages and to share experience, concerns and solutions (ibid). Their approach to helping improve project activities (related to safety) is in line with the Briscoe *et al*'s (2005) findings of principal contractors using external expert opinions on projects to ensure effective interactions and cooperation among the different parties involved in the supply chain. The underlying feature for improving most project practices is reliant on effective communication as it ensures that all stakeholders including clients, principal contractors and subcontractors are all satisfied (Dainty *et al*, 2006; Briscoe *et al*, 2005; Love *et al*, 2004).

Managing the principal contractor and subcontractor

Due to the presence of multiple organisations working in an interdisciplinary environment in construction projects, the task of aligning a common objective within a temporary team is fraught with difficulty (Dainty *et al* 2006: 30). These difficulties can be minimized or eliminated through effective communication. NOSHA thus help moderate communications and interactions between principal contractors and their subcontractors. That is, they act as independent parties with no conflict of interests in the relationships.

For the purpose of this research project, emphasis is placed on the construction phase of projects (rather than the design phase) and specifically, the interaction between the principal contractor and the subcontractor (micro firms).

Whilst there is the direct linkage between the principal contractor and the subcontractor, the use of external opinions (see Briscoe *et al*, 2001) has been found to be able to help relationships in projects. This could be a means of improving trust in the relationship as the parties can express their concerns to this mediating party with hope of receiving a fair arbitration. Berry *et al* (1994) recommend trust building and exchanging information on market needs as very important in the developing of meaningful, long-term relationships and adds that they can be attained through effective supply chain management. Safety Groups UK (2014) boasts of making such partnerships prosper for principal contractors and subcontractors in the long term.

Rationale for research

Past research have looked into relationships between principal contractors and subcontractors (see Briscoe and Dainty, 2005; Love *et al*, 2004; Hinze and Gambatese, 1996). In addition, other researchers have studied the informal aspects of the safety practices of small and micro construction firms (see Aboagye-Nimo *et al*, 2013; Abdel Wahab *et al*, 2008; Dainty *et al*, 2005). However, researchers have not studied the role that local safety groups play in moderating the shift in environment and culture that takes place when micro construction firms are subcontracted on large projects. Furthermore, the role that these local safety groups play in the maintaining of long-term relationships between these micro firms and the principal contractors is understudied. Thus this research project offers much needed understanding on what

these 'unsung heroes' (in the form of local safety groups) are doing in the construction industry.

RESEARCH METHODS

Semi-structured interviews were carried out with two members of NOSHA. The interviewees are independent safety consultants for several major construction projects in the Midlands regions. They negotiate and communicate safety concerns between principal contractors and their subcontractors (usually micro firms) on site. In addition, these consultants carry out routine site inspections on sites and highlight safety issues that need to be addressed by all parties. Their roles in NOSHA include discussing site observations to raise awareness amongst the members of the association. They also learn effective solutions for problems from the other group members. Since the interviewer was not a member of NOSHA, interview questions were derived from an external point of view thereby eliminating a potential conflict of interest or researcher bias.

The semi-structured interviews covered the views of the NOSHA members on the safety cultures of micro construction firms and how these firms operate when they have to work with principal contractors on large projects. Other areas of concern were how they create and maintain harmony between the two parties especially when there are misunderstandings due to the different techniques adopted in site safety. Whilst the Pybus model was not used explicitly in the interview questions, the respondents' perceptions of the safety cultures of micro construction firms were sought after. This was to help establish whether these micro firms follow the suggested stages of evolution in the model. Overall, the semi-structured interviews helped acquire rich and in-depth data on the safety culture of workers of micro construction firms. Furthermore, the chosen approach helped the project establish areas required for additional focus as this was the piloting phase.

Thematic analysis was the main method used for data analysis. Themes were identified from literature review and contents of the interview transcripts. Thematic coding of the transcribed data was carried out using QSR NVivo 9. Using the qualitative data analysis software helped the research project with organisation of their data (i.e. interview transcripts, relevant literature and personal reflections).The next section presents findings from the interviews with the NOSHA members.

FINDINGS AND ANALYSIS

Findings and analysis presented here are from the interviews conducted with two members of NOSHA. These members of NOSHA act as independent safety consultants on large projects in the Nottinghamshire were interviewed. The key findings presented in this paper cover their views on the safety cultures of micro construction firms, differences in practices on sites, managing communication, establishing long-term supply chain relations and approaches to problem resolution. NOSHA plays a key role as acting as 'middle men' when the need arises.

Safety culture of micro firms and the Pybus curve model

The interviewees acknowledged that the micro construction firms they work with do not use any formal rules and enforcement strategies. Furthermore, these micro firms rarely have encounters with authorities such as the HSE or local authority, and for this reason they are not concerned being asked to produce formal records. Thus the micro

firms cannot be characterized as being in the traditional phase on the Pybus curve. The traditional phase shows attention to rules, discipline and enforcement.

The micro construction firms according to the NOSHA members, show attention to safe methods of working and train their new workers to also work safely. However these are done in an informal manner, thereby leaving no official records on such practices. The respondents also pointed out that when workers have addressed safety concerns in the past, they did not recorded them and therefore, the only knowledge of this is committed to memory. Relating these findings to the transitional phase of the model, the micro construction firms exhibit some traits of this but the practices are not officially recorded and as such cannot be placed in this category.

The respondents explain that the safety practices of the micro firms are more dependent on their cultural and motivational issues. Also, the workers of the micro firms include safety in all aspects of their practices rather than treating it as a separate entity e.g. having an official method statement for their safety practices. The final phase of the model may be more receptive to the practices of micro firms. Aboagye-Nimo *et al* (2013) confirm the strong attachment of culture and informality to the safety cultures of small construction firms. From these findings, the notion that micro construction firms do not necessarily go through the three phases of safety culture evolution can be proposed for further exploration. They rather show attributes of firms in the innovative phase.

The respondents believed that the overall safety practices and cultures of small and micro firms had improved, but this did not mean they were working in a similar manner to large firms.

"Even though practices have changed in recent times, small firms still operate differently."

They added that they still carry out their practices such as management and training in informal ways. The different cultures is one of the main sources of misunderstandings between both parties as the principal contractors are more comfortable using official rules and regulations. Using their expertise, the consultants of NOSHA and other safety groups talk to both parties, and try to explain and justify why some of these practices have to be allowed. The practice of using external experts is described Briscoe *et al* (2001) to be effective for integrating project parties.

Also, the consultants sometimes have the responsibility of playing 'Devil's advocate' when they have to ask the subcontractors to go against their usual style of work. The NOSHA members clearly state that there can be safety problems on the part of the principal contractors or subcontractors. In essence, the safety consultants support practices that will be safe and comfortable for both parties. However, some parties may not always be happy with such decisions.

Managing communication

As far as NOSHA's role in managing communication on large projects was concerned, the respondents stated that their presence in the projects enabled both the main contractors and the subcontractors to communicate more openly. Although the most effective means of communication is direct (Dainty *et al*, 2006), the complications of some situations do not make this the best method at all times. There are some concerns that the parties would rather discuss with the consultant representing NOSHA and this is then relayed on to the other party.

One of the main reasons why the micro firms would rather share their concerns with the independent consultant rather than the main contractor is a fear of damaging the long-term relationship they have. One of the respondents stated:

"Complaining could lead to commercial suicide."

He explained that workers of the subcontracted micro firms may have safety concerns about specific practices being carried out on site, but may have a problem with voicing out their opinions. This is because they fear this could create 'bad blood' between them and the principal contractors whom they need for a continuity of supply projects. Getting into disagreements with some of the project managers or site managers, who are representing the large company, can lead to a ***"commercial suicide"***. This is because the micro firm could be 'blacklisted' if they are deemed problematic to work with and hence will not receive future contracts, hence ending the prospects of the long-term relationship (see Taylor, 2013). Concerns about safety practices are thus conveyed through the safety consultants who try to handle the issues delicately in order to maintain the relationship. As stated by Briscoe and Dainty (2005), parties in the project may seek to build long-term relationships, and in the case of the micro firms, they may need the principal contractor more than the principal contractor would need them. NOSHA may be an important ingredient in keeping this relationship ongoing.

Approaches to problem resolution

In projects disagreements can arise when the different parties involved have different views that they feel strongly about. When such disagreements arise, it is in the best interest of the project and all the involved parties that it is resolved quickly and efficiently without the situation escalating (see Emmitt and Gorse, 2003). The NOSHA members agreed that if problems were not *"handled immediately"*, the aftermath would be detrimental to the whole project. The respondent recalled witnessing a situation between some subcontracted workers and the site manage. He stated that:

"...they were absolutely furious about this. In fact one of them had to be held back from punching the site manager."

In this instance, he was able to calm both parties and the project continued. The NOSHA member further explained that it is helpful that the parties in disagreement know that the mediator of a problem is independent and has no conflict of interest in the ongoing situation. The consultants had seen and heard of numerous issues that had occurred on site that escalated into more serious issues as there were no actual problem solving mechanisms in place. The consultants stated that when issues got so intensified, some subcontractors were not even concerned about mending relationships, and this point the relationship is broken beyond repair. This could also be because the subcontractors believe that they cannot conform to the working style of the principal contractor even in future projects. One of the accounts told about site conflicts was the avoidance of a physical attack that almost occurred following a disagreement between one of the subcontracted workers and the site manager (with the principal contractor). Regular consultation with independent bodies on site can help workers share their concerns, as such, matters do not have to get so aggravated.

CONCLUSIONS

This paper has shown the role of local safety groups in improving the relationships between micro firms working as subcontractors for principal contractors on large

projects. NOSHA is a safety group working in the Nottinghamshire region and have been creating and maintaining relationships for small and micro firms with large contractors. NOSHA have the responsibility of working as independent consultants and as such are able to work closely with main contractors and subcontractors, with safety as their main priority.

Using the Pybus curve model, this study has shown that micro construction firms do not follow the proposed evolutionary stages of safety culture. With this in mind, it is proposed that researchers use bespoke research methodology when studying micro construction firms rather than using standardised approaches. This is because the micro construction firms do not use standard methods at work and hence cannot be studied using conventional approaches. This pilot study has highlighted areas that need to be considered critically during the main empirical phase of the overall research project. Further interviews and observations have been scheduled with NOSHA members to explore further how they carry out their role of mediation on construction sites.

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