SAFETY COMMUNICATIONS MANAGEMENT IN CONSTRUCTION CONTRACTING

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This paper outlines the adaptation of communication theory and the development of safety communications management in construction contracting. Effective and efficient safety communication is essential in raising safety awareness and reducing incident frequency in the construction industry, and has the resultant effect of decreasing costs and increasing contractor profitability. Management should work hard at analysing organizational safety communication and removing barriers to effective and efficient safety communication by applying improvement techniques. To ensure continual improvement of safety communication an integrated total safety communications management system is proposed based on proven Total Quality Management and behaviour-based safety principles. Implementation of this requires complete, visible and long-term top management commitment to succeed.

Keywords: communication, construction, contracting, safety.

INTRODUCTION

Construction has a poor safety record and both injury and death regularly occur that not only affects contractor employees but also sub-contractors, suppliers and the general public (Stranks 1991). To reduce accident numbers and associated costs, improved communication techniques should be utilized to raise safety awareness. This paper identifies pressures and benefits of improving safety communications, and analyses communication to identify barriers to efficient and effective communication. The paper goes on to propose a safety communications management system, and outlines the research objectives guiding the next phase of the research.

Pressure to improve safety communication has increased because of new safety legislation, increased magnitude of fines levied against breach of legislation, and pressure from clients, unions and employees (Stranks 1991, Carpenter 1999). Current legislation such as the Health and Safety at Work Act, CDM Regulations and the Construction (Health Safety and Welfare) Regulations, have focused attention on the need to improve safety communications by ensuring employers and employees can be heavily fined for breach of legislation (HSE 1995, 1996b, 1996c, Construction Health and Safety Group 1998). Emphasis on improving safety communication has been applied by the client, as the CDM Regulations state only competent contractors with good safety records should be employed (HSE 1996b).

External stakeholders, such as investors and insurers have applied pressure in the form of reduced investment and increased insurance premiums for contractors with a poor safety record. Unions, safety representatives and workers are also becoming more aware of how work affects their health and the need to improve safety at work (Stranks 1991). Competition has increased for contracts forcing contractors to

improve company safety records. A good safety reputation is an essential marketing tool.

BENEFITS OF IMPROVING SAFETY COMMUNICATION

There are many knock-on effects of accident occurrence such as reduction in morale, productivity and loss of key clients and contracts, all of which result in direct and indirect costs that reduce contractor profitability. Direct costs which can be accurately measured and encompass fines for breach of safety legislation, insurance premiums, claims from injured parties and legal/court costs (Stranks 1991). Indirect costs, are more difficult to quantify and include treatment of injured parties, lost time costs, production costs, and liquidated and ascertained damages due to delays experienced by the incident (Stranks 1991).

From a total loss approach increased incident frequency results in system downgrade, that causes losses which increase cost and reduce profitability. Implementing an integrated total safety communications management system should reverse this effect and serve to promote, publicize, educate and reinforce safety issues that act to continuously improve a contractors organizational safety communications culture. As a result, the improvement of safety communication can provide immeasurable benefits for contractors by reducing accidents, lowering costs, improving productivity and providing improved value for the construction client.

THEORY OF THE COMMUNICATION PROCESS

The communication process was proposed by Shannon and Weaver in 1948 and is made up of several discrete functions that interact as communication takes place. It comprises the sender, message transmission, the receiver and a noise factor. The *sender* initiates communication and is responsible for encoding the message into a series of symbols in a written, verbal or non-verbal medium that both sender and receiver can understand. After encoding the message is *transmitted* to the receiver using a formal or informal communication channel. Formal channels follow lines of organizational hierarchy, are directive in the downward direction and used to receive feedback in the upward direction. Informal channels are usually called the grapevine and do not adhere to organizational hierarchy, transmitting information in any direction (Thomas *et al.* 1998).

On receipt of the message the *receiver* decodes the symbols and attempts message interpretation. Here communication can break down, as the receiver may not assign the same meaning to them as the sender, thus to complete a two-way communication process the receiver should provide feedback to the sender, which indicates if further explanation or clarification is required. *Noise* can occur at any stage of communication and acts to interfere with or distort the message, resulting in reduced communication fidelity that causes confusion and misunderstanding to both sender and receiver.

BARRIERS TO EFFECTIVE AND EFFICIENT SAFETY COMMUNICATION

Effective communication results in both sender and receiver achieving mutual understanding, and communication is made efficient when mutual understanding is achieved at minimum resource expenditure (Schermerhorn *et al.* 1994). To achieve effective and efficient safety communication and maximum benefit from a total safety

communication management system, management and employees should attempt to remove all barriers. There are 9 main barriers as follows:

Absence of feedback
Feedback informs the sender if the receiver requires further safety information or safety issue clarification. If feedback is not provided communication effectiveness is reduced and management assumes that mutual understanding of the safety issues has been achieved (Gibson *et al.* 1994, Thomas *et al.* 1998). Feedback ensures management can take proactive action, educate and reinforce safety issues.

Frame of reference and selective listening
A sender or receivers frame of reference will mean they encode, decode and interpret messages differently dependent on their education, relationship with sender or receiver, attitude and experience. Safety communication effectiveness and efficiency can be reduced if sender or receiver experience frame of reference problems, as mutual understanding will not be achieved (Gibson *et al.* 1994). Another problem experienced is selective listening, which involves the receiver ignoring any safety information that conflicts with their perception of safety issues, preventing mutual understanding and only partial communication of the safety message.

Sender credibility
If the receiver does not see the sender as a credible source of safety information premature value judgements will be made and mutual understanding will be prevented (Gibson *et al.* 1994). Sender credibility is influenced by trust, confidence, and past experience and takes a long time to develop. It needs to be maintained by management to achieve any degree of safety communication improvement.

Technical language and jargon
Communication involves the sender transmitting the safety message in symbols which are interpreted by the receiver. If the receiver does not attach the same meaning to the symbols as the sender, mutual understanding will not occur (Gibson *et al.* 1994, Bowditch and Buono 1994). The construction industry is well known for technical jargon. However, if used to communicate safety information to those with no past experience, confusion and misunderstanding may occur.

Filtering
Filtering of upward communication so management perceives the safety situation on site as positive is very common within the construction industry. This is because the safety situation is poor (Gibson *et al.* 1994, Thomas *et al.* 1998). Filtering ensures the middle and lower level management are seen to be performing well but provides upper level management with an inaccurate scenario of the true situation, preventing proactive action to improve safety communication and control on site until an incident occurs.

Status differences
In the construction industry, where sub-contracting is heavily utilized, management status differences can lead to a number of problems. Receivers of lower status can perceive management as more knowledgeable and accept safety messages without questions or feedback (Gibson *et al.* 1994). Also management may dismiss feedback from those of lower status by adopting a 'what do they know' attitude. This denies site

staff and sub-contractors the opportunity to input possible practical improvement ideas.

Time pressures
Pressures to perform safety training, and provide safety information quickly to reduce associated costs and losses of productivity, are always present. This may lead to limited safety meetings and training. Safety communication under time pressures at best leaves employees with confusion and misunderstanding if the information is actually received at all (Gibson *et al.* 1994).

Information overload
Too much safety information means that employees cannot sort, or use all information provided and this results in selective filtration, omission or queuing of important information until overload decreases (Gibson *et al.* 1994). Overload can reduce communication effectiveness and efficiency as messages can be ignored or lost. Urgent safety messages can be delayed and mistakes made in subsequent feedback.

IMPROVING THE SAFETY COMMUNICATION PROCESS

To achieve effective and efficient communication and achieve full benefit from a total safety communication management system barriers need eliminating. This requires continual effort using the following techniques;

Encouragement of feedback and use of active listening
To improve safety communication, management should encourage feedback that provides cues notifying if explanation or clarification of safety issues is required. Two-way communication is also a valuable source of practical safety improvement ideas provided by site staff. Management should actively listen to site staff and aid them to provide feedback in a non-confrontational manner. This involves listening to message content, and actively responding to the message in the context intended by noting all verbal and non-verbal information cues provided during feedback (Gibson *et al.* 1994). To complete the process management should then reflect back what they think site staff were trying to express. Communication performed in this manner is more time consuming but ensures safety communication fidelity is maintained.

Regulation of information flow and balancing of repetition
To prevent overload, management should regulate information to an optimum level in terms of quality and quantity coincident with that of the user (Bowditch and Buono 1994). Regulation involves providing safety information on a just-in-time basis, so the user only receives new and updated safety information and training when needed. Regulation should be used to balance repetition, which is used to ensure that if a message is misunderstood other messages carry the same information and increase the probability of mutual understanding (Bowditch and Buono 1994). Repetition can lead to premature value judgements and selective listening if information becomes monotonous which should be avoided.

User oriented communication
Managers should realize that site staff, visitors and the general public will have a different viewpoint from their own. Thus to achieve effective communication, safety messages should orientated toward the user through anticipation of how it will be decoded. This enables management to tailor subsequent communication to users level

of education, value system, attitude and experiences. In doing so management can attempt to remove several barriers consisting of frame of reference, selective listening, sender credibility, value judgements and information overload.

Appropriate and effective timing of message transmission
Safety messages should be delivered to users at an appropriate time avoiding information overload and physical distractions such as tea, lunch or finishing times (Bowditch and Buono 1994). Depending who the message is being transmitted to this may involve using off-site locations such as hotels, universities, community halls or specialized safety training facilities. This will increase resource expenditure but should be thought of as a positive business investment not an increase in costs or loss of production.

Improvement of upward and downward communication
To improve upward communication, management should implement employee suggestion schemes, open door policies, participative decision-making and carry out thorough employee safety surveys (Gibson *et al.* 1994). Participative decision-making can also improve upward communication and ownership, as employees are actively involved in developing a site-specific safety communication system. An efficient and speedy way to measure the attitude of employees toward safety is to carry out an employee survey. The results from an employee survey are usually more representative if the survey is carried out anonymously and has the positive affect of allowing management to accurately target particular problems (Bateman *et al.* (1996).

In order to improve downward communication management should become receiver-oriented when communicating safety rules, regulations, procedures and performance appraisals. Safety issues are made up of complex and technical content and management may choose to use verbal communication backed up by a written handout or viewing of safety video's to reinforce important points. If the safety message is more straightforward then management may choose to use a written media campaign such as posters and handouts to communicate safety issues. Whatever improvement method is used, it should be aimed at promoting employee ownership, as this is a critical factor in the success of any safety communications system (Hidley 1998).

THE WHAT, WHO AND HOW OF IMPROVED SAFETY COMMUNICATION

To achieve safety communication success management should work diligently at applying communication techniques outlined in this paper to continually eliminate barriers. These techniques should be used to improve *'what'* information is being communicated, to *'whom'* and *'how'*.

What management communicates
Management should by law communicate a large amount of information to employees, site visitors and the general public, but to avoid information overload and confusion it is recommended that the four R's of rules, regulations, responsibilities and risks make up the bulk of information communicated (Bateman *et al.* 1996, HSE 1996a; 1997).

Safety *rules* outline the company's philosophy and commitment to safety and all employees, site visitors and general public should understand it is high priority issue.

Top level management should show visible safety commitment to foster full employee commitment and co-operation. There are many *regulations*, laws and standards applicable to the construction and all need communicating if safety objectives are to be achieved (HSE 1996a, Bateman *et al.* 1996). To avoid overload, communication of regulations should be planned along 'just-in-time' principles so only required regulations are communicated in a clear, concise and correct manner when needed (Thomas *et al.* 1998). All employees should be fully aware of their *responsibilities* and should be provided with all information necessary to carry them out in a safe manner (Bateman *et al.* 1996, HSE 1996). Management should also provide information, instruction and training so employees can carry out their responsibilities fully aware of *risks* to safety, measures to prevent them and emergency procedures in event of risks being realized.

Who management communicates with
The organization should ensure safety of both those employed and not employed by the company who may be affected by construction work (HSE 1995). To ensure that the organization is 'up-to-date' with legal and technical developments a constant stream of safety data needs to be maintained. Practical information can be obtained from the Health and Safety Executive, Construction Industry Training Board, RoSPA, Building Employers Confederation, British Safety Council, and safety periodicals and journals among many other sources.

Within the organization, effective upward, downward and lateral communication of safety information is of paramount importance. Communication should be clear, concise and correct and duplication and repetition avoided by developing a balanced information system that is continuously monitored, controlled and updated (Bowditch and Buono 1994). Employees should feel comfortable communicating with management when risks are greater than planned, safety performance indicators are ineffective and safety precautions impractical.

Management communications extend outside the organization and sub-contractors, visitors, neighbours, and general public should be aware of the dangers inherent in construction (Preece *et al.* 1998). This may involve informing visitors of rules, regulations, responsibilities and risks, notifying neighbours of working hours, increased noise levels and vehicular activity. Particularly during holiday periods it is vital to inform schools and community groups that dangerous work is being performed and all children should not enter the site.

How management communicates safety information
For safety communication to be effective it has to be understood, which is governed by the safety information to be communicated, the target audience and environment where information transmission takes place. There are two main communication media comprising of written and verbal that can be used separately, or in combination depending on message content. Communication through management action is also important and includes safety inspections, formation of safety committee's, incident investigation, and school/community group liaison (Preece *et al.* 1998).

Written safety communication
Safety handbooks should be readily accessible, contain information that communicates rules, regulations, and risks to employees, and referenced to further safety information. Handbooks should be provided to all employees in a bound format so complete updated copies can be issued, which ensures all employees are

updated of legal and technical information changes. Manuals should communicate more specific safety information such as how to operate machinery, accident reporting and dealing with emergency situations. Full manuals should be located in principal contractors and sub-contractors site accommodation and should be accessible to all employees.

Notice boards should use to transmit information of short-term importance such as general safety performance, hazard refresher information, accident and incident report summaries, procedure updates, minutes of safety review meetings and safety inspection reports. Notice boards should not be used to display detailed procedures, as they will not be read. Posters should also only be used to communicate general safety information and should in no way used as a substitute for safety training. Posters should be linked to current safety campaigns and displayed in areas where they will receive most attention. It is very important to update notice boards and posters by removing obsolete material, as employees will not take the time to search through out of date material.

Newspapers and safety newsletters should communicate more detailed safety information to employees. Articles should capture interest or an excellent communication opportunity is lost. Articles should be visually attractive and report information of human interest such as achievements, interviews, and personal profiles. Articles should also contain behaviour corrective information such as injury prevention and accident report summaries, humour should be used to emphasize safety messages and the writer should not afraid to be controversial in order grab reader's attention.

Suggestion schemes are a method of improving upward communication. All suggestions need to be evaluated and feedback should be given informing employees of action to be taken. Emphasis should be placed on the provision of practical solutions to safety problems and they should in no way be used a substitute for a hazard reporting system.

Verbal safety communication
Verbal safety communication is potentially much more effective than written, as information transmitted can be questioned via feedback, leading to greater mutual understanding. Management should regularly engage in verbal communication with staff and sub-contractors, and should not remove themselves from difficult questions and arguments as they may provide important practical information of safety communications effectiveness. Safety meetings are also vitally important to the safety effort as they update management on the organization's safety objectives, new standards and expected performance. Presentations at local schools and community centres should also be carried out to disseminate the safety message informing local children and families of dangers inherent while construction is in progress. Communication with local press and media should be carried out to publicize any site safety issues that may place neighbours and the general public at risk.

Safety communication through management action
Management should visibly show total commitment to safety communications in order to maintain credibility with staff and sub-contractors and set standards for all others to aim for. In conducting regular formal safety inspections and taking action on all safety issues arising, management are communicating their safety commitment through action. Safety committees chaired by senior management visibly shows

interest and support that management is committed to safety as a high priority. Questioning of staff and team members on safety related matters also demonstrate management's own interest and stimulates employees interest so they are prepared to answer any further enquiries. Recognition of good safety performance by presenting safety awards, safety performance appraisals and organizing social event with a safety theme, can also further demonstrate management safety commitment.

DEVELOPMENT OF A SAFETY COMMUNICATION MANAGEMENT SYSTEM

Safety communications should be integrated with existing quality and environmental systems to avoid duplication and contradiction of standards. An integrated system should improve workforce morale, increase employee involvement in safe practices and reduce incident frequency rates. Total quality principles and techniques applied to safety involve all employees working towards continuous improvement safety communications to achieve a primary objective of zero accidents (Weinstein 1996). Behaviour based techniques involve all employees working towards continuous improvement by identifying and defining critical safety related behaviours that are to be actively communicated to all employees to achieve increased safe behaviour (Krause 1997). Combining the two management principle's provides a system that works towards a long range plan of continuously improving communications that identify and define critical safety related behaviour with a primary objective of achieving zero accidents (Weinstein 1998).

The system should be planned, structured and rigorously implemented so everyone is aware of the planned implementation. This requires a period of cultural and strategic alignment so the company's objectives become consistent with improving safety communications to reduce incidents. Alignment and improved communications should be driven by leadership commitment towards a zero tolerance safety culture. The system should promote effective communication as a high priority, and work toward removing all barriers to a free flow of safety information. A common safety language should be used by all in the organization.

Effective communication and training will advance employee's knowledge and skills. this should result in an increase in empowerment, employee's participating in work planning and safety, and sharing responsibility for a safer working environment. By emphasizing communication, the change effort and alignment needed is explained and marketed to those within the organization which will promote ownership which is a critical factor in success of the system. Communication initiated buy-in has two key aspects. The first involves people becoming actively engaged in safety-related behaviours needed for success and the second aspect creates a sense of practical realization that the systems objectives are achievable rather than ideological (Manzella 1997). In order for the system to reach maturity it needs to be part of management overall philosophy and should encompass ongoing training of site staff and management, also improvement of the system needs to be constantly monitored so that planned benchmarks are achieved, this requires constant employee feedback.

There should be a realization that effective and efficient communication may cause some work to be made more difficult particularly in middle management and at supervisors/foreman level who tend only to think of production. In order to avoid this, communication managers should be provided with clearly defined roles, accountability, resources and most importantly education and training on a 'just-in-

time' basis (Hidley 1998). Sporadic flavour-of-the-month safety communications campaigns should be avoided by concentrating on a more holistic lifecycle communications improvement approach (Rich 1997).

CONCLUSIONS AND FURTHER DEVELOPMENT OF THE RESEARCH STRATEGY

This paper has analysed the safety communications process and identified the barriers to effective and efficient communication with possible methods for their elimination. The who, what and how of safety communications was presented which leads to the outline proposal for an integrated safety communications management system combining Total Quality Management and behaviour-based safety principles. It is asserted that the system should be used to continuously improve safety communication and facilitate identification and definition of critical safety-related behaviour with a primary objective of achieving zero accidents.

The proposed system needs to receive visible commitment from top management to succeed with a realization that improved communications may make some tasks more arduous particularly for middle management and supervisors/foremen. The communication system needs to receive continual directed effort by all, avoiding sporadic flavour-of-the-month safety communications campaigns by concentrating on a more holistic lifecycle communications improvement approach.

In terms of the further development of this research project with construction contractors the objectives are to;
- explore how health and safety policies in construction firms have been developed and are communicated at a corporate and site level,
- the level of commitment to safety implementation at an organizational level,
- who the health and safety stakeholders are at project site level and assessment of their needs,
- what health and safety messages need to be communicated,
- how the effectiveness of health and safety communication may be assessed, how feedback and monitoring mechanisms may be implemented, and
- ways of encouraging participation to facilitate continuous improvement

The research will involve surveys of;
- construction safety officers to identify current practices, specifically focusing on safety policy development, implementation at the corporate level,
- project managers to identify and asses the safety communications needs of stakeholders at the level of construction projects,
- site safety officers to identify methods and messages currently communicated, and the extent of worker participation,
- in addition, in-depth demonstration case studies will be used to identify,
- techniques currently used to communicate safety and the outcomes expected,
- effectiveness of communications and levels of participation through survey of direct labour and sub-contract operatives.

The benefits of the proposed research are to improve health and safety communications at corporate, site and individual level, increase worker/management participation in health and safety issues, improve the safety performance of labour-

only sub-contractors and the effectiveness of training through more effective communication techniques used by construction companies It should also improve the health and safety culture of contractors.

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