

# The usefulness of Critical Incident Technique (CIT) in eliciting plant competencies

A Pilot Study

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# The usefulness of Critical Incident Technique (CIT) in eliciting plant competencies

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Richard Snodgrass MSc, C Psychol, AFBPsS,  
Roxane L Gervais Ph.D, CSci  
Edward Corbett MSc, C Psychol  
Emma Wilde BSc

Health and Safety Laboratory  
Harpur Hill  
Buxton  
Derbyshire  
SK17 9JN

The Health and Safety Laboratory (HSL) conducted the research on which the present report is based for the Health and Safety Executive (HSE). The research was contracted to examine the relationship between competencies and the reasons for accidents and incidents involving construction plant operators. The present research is the Pilot Phase of the project and is meant to establish the efficacy of a critical incident technique method.

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# EXECUTIVE SUMMARY

## Purpose

To establish the efficacy of the critical incident technique (CIT) method, for the purpose of examining the relationship between competencies<sup>1</sup> and the reasons for accidents and incidents involving construction plant operators.

## Objectives

- To pilot the use of critical incident technique with a selected sample of plant operators in the construction industry.
- To pilot the analytical procedures to be used in the interpretation of the data.
- To produce a report with recommendations as to how to use this methodology.

To date, research has identified that issues of competence lie behind accidents/ill health in construction industry plant operatives (e.g. Choudhry and Fang, 2008). However, other factors may also be involved. The extent to which competence, or the lack of it, is responsible for accidents/ill health is not clear. Little is known of the exact nature of these issues since much of the evidence tends to be quantitative material, which gives limited information. In order to explore these issues, a qualitative approach is proposed as it is the research methodology that can generate richness of information in context.

The critical incident technique is qualitative in nature and thus provides a possible method to provide the quality of information necessary to understand the relationship between competencies and accidents/ill health. This pilot study will attempt to establish the efficacy of this method in determining this relationship for construction plant operators. The work is conducted in partnership with two other organisations, the Noordwijk Risk Initiative (NRI) Foundation, and ConstructionSkills.

## Methodology

Using the critical incident technique, this pilot study concentrated on plant operators in two categories; excavators and dumpers. These machines have been identified as plant that is most commonly used and which attract a high level of accidents. The preferred method for this study was qualitative, based on interviewing. All interviews were audio recorded. The resulting data were subjected to content and thematic analysis.

## Results

Two main learning points emerged from the pilot that illustrate the efficacy of critical incident technique for this type of work and working in partnership with external organizations. Firstly, the small numbers involved in the pilot mean that the data cannot be considered robust enough to draw firm conclusions. Secondly, indications are that there is a complex interaction of both technical and interpersonal skills that operate to help reduce/prevent accidents on construction sites.

Overall, the eighteen interviews yielded the following:

- Thirty-two critical incidents were identified from 15 interviews.

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<sup>1</sup> Competencies refer to both the behaviours and the minimum standard required to function effectively (Hogg, 2008)



- Only one of the 18 interviewees had personally witnessed a fatality; that was 20 years ago.
- Two interviewees gave third party accounts of a fatality.
- The interviewees gave accounts of 16 accidents.
- The interviewees gave accounts of 16 near misses.
- The interviewees were involved personally in 16 of the 32 critical incidents.

## **Recommendations**

The following recommendations are proposed to move the research forward:

- 1) Critical incident technique is a valid tool for this work, as it can capture detailed information about incidents, and could be used in any further studies. However, it is essential that any interviewer who is involved in the process is aware of the nature of the technique and how to proceed.
- 2) Discussions should be held with ConstructionSkills, especially in respect of the Construction Plant Competence Scheme (CPCS) to gather data in respect of existing and new competencies that could be incorporated into any future studies.
- 3) There is a need to progress with this work in the construction industry to build on those competencies that the literature has shown is relevant, and that needs to be explored further. The competencies outlined from the present research, is one step in that direction.
- 4) Any future work needs to be clearly defined, especially in terms of the recruitment of the participants, such as determining if they have experienced an incident. Further, they must be comfortable to disclose information.
- 5) Boundaries about the research process need to be established from the outset. The HSL and the HSE need to firm up working relations with external partners so clear expectations and roles are put in place from the outset.
- 6) Due to the possibility that flashbacks may occur when the participants are recalling the incidents, it is essential that the appropriate ethical issues are addressed.











































































## Overview of Incident

<b>No.</b>	<b>Topic</b>	<b>Answered</b>
<b>A</b>	<b>A. Interviewee (GENERAL)</b>	
1	Current JOB of interviewee?	
2	AGE of interviewee	
3	TRADE of interviewee	
4	How LONG has interviewee worked in the construction industry?	
5	What BASIC TRAINING has interviewee received? Refreshers?	
6	Trained WHEN and by WHOM?	
<b>B</b>	<b>B. People (specific to incident being recalled)</b>	
7	INSTRUCTIONS given before start of memorable occasion	
8	Interviewee EMPLOYED by the principle contractor	
9	Interviewee a SUBCONTRACTOR	
10	Interviewee EMPLOYED by a subcontractor	
11	What CARD did the interviewee hold	
12	OTHER PEOPLE involved?	
13	Basic TRAINING of other persons involved, refreshers?	
<b>C</b>	<b>C. Process</b>	
14	Process / situation – CLEAR and DETAILED?	
15	Was this process / situation a SPECIAL duty or NORMAL task?	
16	SITE LAYOUT?	
17	EQUIPMENT e.g. serviced, familiar, new, type, condition, deficiencies, etc	
18	How was the mechanical DESIGN of specific components?	
19	How did people REACT to the EQUIPMENT, e.g. turned something wrong way, overshoot, assembled wrong, misinterpreted instruments?	
20	What written PROCEDURE was involved?	
21	Was there CONFUSION, RUSH or AMBIGUITY	
22	Was it a POSITIVE or NEGATIVE outcome?	
23	Why do YOU THINK of this as positive - negative?	
24	Why do you think this CAME OUT positive - negative	
25	Is this example COMMON? Everywhere or just some places? Why? Why not?	
26	Involvement of MAINTENANCE people?	
<b>D</b>	<b>D. Circumstances</b>	
27	DATE	
28	TIME	
29	VISIBILITY (Daylight/dusk/night/fog/...)	
30	WEATHER	
31	SHIFT	
32	OTHER equipment involved	
<b>E</b>	<b>E. Others</b>	
33	Is there IMMEDIATE ACTION needed (on what)?	
34	Is there ANYTHING ELSE YOU WANT TO ADD?	









































































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