

**Title: Construction Induction Training: how effective for the Housing and Civil Construction Industries in WA?**

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### **ABSTRACT**

Introducing practices to reduce the number of work-related injuries in the construction industry is a continual challenge, specifically in WA where the industry is adapting to the additional pressures of a second development boom this century. In 2006, Worksafe WA responded by introducing mandatory certification in safety awareness training for all employees, before they could begin work on a construction site. This paper reviews the impact of this training on the housing and civil sectors of the industry. It presents both the perceptions of the stakeholders from their survey responses and from the analyses the lost time injury/disease statistics. These interim findings indicate the training initiative has made a difference. Many respondents reported they believed their workplaces are safer.

**Key Words:** Mandatory training, safety training, construction industry.

### **INTRODUCTION**

This study focuses upon and reviews the development of mandatory pre-site safety training in the housing and civil construction sectors. A pilot study conducted specifically in the commercial construction sector was completed in 2010 (Bahn & Barratt-Pugh, 2010). This research is currently being extended into the remaining two construction sectors. This paper details the data collected from a survey distributed to the housing and civil construction sectors in early 2011.

In 2001, the Western Australian (WA) construction industry adopted a program of safety awareness training, commonly referred to as the 'Green Card'. In 2006/07, WA rolled out a local replacement competency-based certification programme, commonly referred to as the 'Blue Card' which required re-certification tri-annually. In 2009, WA adopted the national Construction Induction Training ('White Card') programme, based upon national competencies that form part of a training package within the Australian Qualification Training Framework (AQTF) which offers a statement of attainment, that validates life-long competency. The aim of these initiatives is to ensure that all workers in the construction industry (commercial, housing, and civil) complete a safety awareness course before working on a construction site. The progression of these training programmes has been

to develop the industry training culture towards mandatory, competency-based, and nationally accredited pre-site safety awareness certification. This study focuses upon the impact of these schemes on the stakeholders in the housing and civil construction industry with specific emphasis on the Blue Card and now White Card (CIT) initiatives.

The Construction Induction Training (CIT) program has been delivered in a variety of modes and in very diverse conditions across many different locations in WA. It has been 4 years since the initial roll out of the programmes, and it is timely that the effectiveness of this training is evaluated. The Construction Induction Training was developed by the Construction and Property Services Industry Skills Council (CPSISC) for the National Skills Council and is a legislative requirement by Worksafe WA. The programme is 80% funded for the industry by the Construction Training Fund (The Fund). The Fund is built from a levy on all major construction projects valued at more than \$20,000 in WA. Construction companies can apply for funding assistance for their employees to complete the CIT. The CTF has funded over 150,000 construction workers to complete a range of courses associated with OHS between 2006 and 2011.

## **BACKGROUND**

Research substantiates that safety training interventions have led to an improvement of safety behaviours and a reduction of hazards in the workplace (Kinn, Khuder, Bisesi & Whoolley, 2000; Dong, Entzel, Men, Chowdhury & Schneider, 2004; Gillen, Baltz, Gassel, Kirsch & Vaccaro, 2002; Varonen & Mattila, 2000). However the organisational management of safety is still a widely contested arena as Biggs, Sheahan & Dingsdag (2006, p.2) indicate that 'under current legal frameworks, construction companies are required to ensure that people in charge of works are competent to manage OHS obligations; however there is no nationally based or accepted framework that specifically articulates who needs to do which tasks and what competencies they require'. This is supported by Zanko (2006, p.4) who found that there is currently no clear understanding of what constitutes occupational health and safety management and without this definition in place there is ambiguity and uncertainty about 'what to do and what not to do'. Burke, Salvador, Smith-Crowe, Chan-Serafin, Smith and Sonesh (2011) note that safety-related problems in organisations are often training related or training relevant. In their study investigating how safety training and workplace

hazards impact the development of safety knowledge and safety performance they found that the method of safety training delivery has an effect. They argue that when training becomes more engaging it is more effective and results in “greater knowledge acquisition, a higher level of safety performance, and a greater reduction in accidents and injuries” (Burke et al, 2011:48). Goldstein and Ford (2002) argue of the importance of the positive transfer of training to the job that leads to relevant changes in work performance. So while there is evidence that training and engagement in safety learning is both required and has established a pattern of success, there remains no clear guidelines on how such interventions should be implemented and managed.

In 1997, the United States Occupational Safety and Health Administration developed a Union-based ten-hour hazard-awareness training program (Smart Mark) for the construction sector. This program is the most widely used construction safety and health awareness training course in the US (Sokas, Nickels, Rankin, Gittleman & Trahan, 2007) and is frequently incorporated into apprenticeship training courses. The program delivery includes active interaction, questions/answers, and mock-up construction settings within 13 modules selected on the basis of relevance to each particular construction trade. Sokas, et al. (2007) evaluated Smart Mark to assess the strengths and weaknesses of the training materials, to determine the most commonly encountered hazards and the impact the training may have had, and to determine whether interactive instruction and the inclusion of supervisors impacted the training. The evaluation method was a web-based survey of outreach trainers of Smart Mark. Their findings included: identifying electrical safety and fall protection as the two most useful modules; a little over half of the work sites improved safety practices by either changing their safety policies or work practices; and supervisors included in the training had no impact. The researchers recommended that this last aspect of the evaluation requires further exploration. In addition, Kinn, et al. (2000) conducted a study with plumbers and pipe fitters in Ohio and found that workers who had received a site specific safety induction<sup>1</sup> had fewer injuries, although the impact of the safety awareness training could not be determined. In 2010, Shaikh completed a PhD

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<sup>1</sup> Inductions carried out at individual work places to address specific hazards such as safe handling of machinery.

study into the impacts of safety training on Newfoundland fishermen's knowledge and attitudes toward safety and found that the group moved from a general aversion to support for continual training in safety. There is therefore evidence that well targeted training interventions not only have an impact upon worker practices but also have an impact upon attitudes to safety or the safety culture within organisations.

Worksafe WA took a step towards addressing safety culture issues by introducing a mandatory safety awareness induction, the 'Blue Card' in 2006/07, for all construction workers. The aim of the Blue Card is to ensure that all construction workers have minimum training in general site safety including working at heights, working in confined places, general lifting, and working with hazardous materials before they work on any construction site. The Construction Induction Training does not replace company, site specific, or job role inductions, but is additional to them. In 2009 there was a move to replace the state Blue Card with a national training program Construction Induction Training (White Card). The reasoning behind this move was that the previous Blue Card was only valid in WA and did not reflect the need for more universal and transferable national competencies. Therefore, Worksafe WA moved to a national minimum safety standard for all construction workers. The changes from the state Blue Card to a national training program (Construction Induction Training) may have future ramifications for the learning practices and organisational outcomes. The state Blue Card required renewal and re-training every 3 years, however the national Construction Induction Training provides workers with a unit of competency within a certified training package and thus does not require reassessment.

### **MANDATORY TRAINING PROGRAMMES**

We live in an organisational society. As actors within society and within our organisations we are subject to rules, guidelines and regulations that are in place to both protect individuals from the actions of others and to protect individuals from their own actions. As Locke indicated social governance, and in this case organisational governance, is about achieving balance where individuals conform to certain rules for the greater good, giving up specific freedoms so that a more collaborative

goal can be achieved (Locke, 1971). In this case the greater goal is that all employed in construction return home safely every night. However as we know and as statistics tells us, our goal is far from being achieved as the by-lines at the end of our local news broadcasts continually remind us. Making rules and achieving compliance is a continual management dilemma. In terms of construction safety the challenge is significant because of the increasing dimensions of construction sites, the transient nature of the multiply contracted workforce and the increasing mechanisation of practices. It is therefore understandable that faced with continued incidents and a failure to achieve the safety goal, the industry and regulators strive to implement initiatives that increase regulation that are designed to achieve greater safety results. While all incidents are investigated and lessons are learned about specific risks, it is still the lack of compliance over normal working activity that remains the area most in need of improved standards and practices.

However, while the risks and incidents are clearly understood by managers and operatives the silver bullet remains: what form of learning is most likely to improve and sustain safety behaviour in an ever more complex construction workplace environment? Here we face the equally complex world of learning theory with more than a century of discipline history and divergent agendas when focusing upon current best practice. Much of our social learning is carried out as a voluntary activity with all the inherent advantages of personal motivation, however issues of health and safety cannot be left to individual choice and they are in the vanguard of those that are often positioned as mandatory learning (NOHSC: 3020, 1994). The inherently dangerous environments of construction sites, despite safety initiatives now confront new employees with complex and multiple challenges that are very different from their social life outside. Compliance with safety regulation should be positioned as an imperative and given the highest priority. Mandatory programs rather than voluntary learning appears to be offer a more appropriate course. In addition, mandatory learning and regulatory certification that must occur *before* an operative is allowed onto a construction workplace. However, we are aware that mandatory programmes often provide an illusion of complete and continued compliance that is seductive and easily consumed and simultaneously a challenge for those managers and operatives who intend to subvert the system and achieve certification without learning.

Mandatory approaches to learning discard the long history of individual learning research that stresses the imperative of personal motivation and contextual relevance in achieving changes of personal knowing and subsequent actions (Knowles, 1990; Kolb, 1984; Lave & Wenger, 1991; Rogers, 1969). However learning design often privileges institutional control of the selection of learners, the content of learning, the goals of learning, the methods and location of learning and the subsequent certification processes. Such learning patterns position the learner more as the passive recipient rather than an active participant. So in terms of introducing mandatory pre-site safety training for the construction industry, there are several academic questions that remain about such a process and practice: Is such a regulated, often de-contextualised, certificated learning process, with its inherent pedagogic limitations justifiable in terms of safety training? If we can justify a mandatory approach in this context can the processes be orchestrated to provide learners with ownership, an active role in the process, relevance for the learners, and produce a learning interaction that guides and embeds learning that will endure during subsequent work practices? In short is mandatory learning for compliance compatible with effective learning practices (Noone, 2008)?

While the statistics and questionnaires associated with this study will indicate the broad level of acceptance and impact of the scheme, it is the subsequent interview stage that will indicate what forms of learning have developed within the mandatory training structure. The challenge for the industry is on the one hand to 'sell' the imperative of pre-site certification and yet design learning experiences that are not all about compliance. The goal is not certification but enduring safety behaviour on site. Given the programme is compulsory how can the interaction be designed to be contextually relevant and meet individual needs? Learning compulsion so often privileges content acquisition and marginalises individual needs. Will these construction industry programmes embed valuable long term behaviour patterns or just return short term administrative goals?

## METHODOLOGY

This study focused on collecting industry perceptions of the value and effectiveness of the *training system*, the associated relevance of the *training activity* and the subsequent *workplace impact*.

The analysis of the quantitative data for this paper will focus on industry perceptions of the relevance of the training, and recommendations that may improve the effectiveness of subsequent system developments and inter-industry relations.

The study utilised a mixed mode data collection as both social perceptions and recorded data are relevant to the phenomena under investigation to evaluate the training programme. Three key research questions that drove the study were: Having experienced the Construction Induction Training system in the construction industry during the past 3 years in WA:

1. How effective has the Construction Induction Training certification system been for the industry?
2. How effective have the Construction Induction Training practices been for the industry?
3. How has the Construction Induction Training system impacted upon organisations and safety in the industry?

Each research question investigated the issues, benefits and barriers associated with the scheme as well as gathering the perceptions from a range of stakeholders about the value they place on the scheme. This study was designed as a case study of the Construction Induction Training intervention within the housing and civil sectors of the industry in three phases; planning and literature review; broad survey instrument to stakeholders; deep interviews with stakeholders. Each phase gathered evidence that informed the construction and focus of the subsequent stage in an iterative fashion. The study also developed through an action learning approach, collecting data and reviewing the findings collaboratively with a reference group established for this study. Members of the reference group were made up of representatives of Worksafe WA, the Construction Training Fund, the Master Builders Association, the Housing Industry Association, the Australian Workers Union, the Construction Forestry Mining and Energy Union and ECU. The reflections on the data collected both informed subsequent data collection, and also developed recommendations to fine-tune the current practice of the Construction Induction Training system. While the FB&L researchers drove the study, the CTF provided access to the network of companies involved, while Worksafe WA provided the study with legitimate State authority incident and fatality statistics for the commercial construction sector. Table 1 indicates the sample purposively selected for the research project to explore the research questions.



*Insert table 1 here*

## FINDINGS

### Incident and fatality statistics

The Construction industry has the fourth highest incident rate per 1000 employees over all Australian industries. The number of workers compensation claims has steadily been on the rise in the construction industry since 2003 with the peak in 2004/05. In addition in 2006/07 the number of workers compensation claims is only 355 less than the peak in 2004/05 and had risen from the previous year. Figure 1 displays the incidence rate and number of workers compensation claims 2000/01 – 2006/07.

*Insert figure 1 here*

Limited statistical analysis that breaks down Australian lost time injury and diseases (LTI/Ds) figures on a state and territory basis is available. Only WA, NSW and Tasmania publish their statistics. In NSW and Tasmania the construction industry in 2006/07 experienced a higher than average incidence of workplace injury (New South Wales Workers Compensation Statistical Bulletin, 2006/07; Work Cover Tasmania, Feb 2008).

Worksafe WA is particularly vigilant in this area in WA and has statistics available for the construction industry as a whole in WA. Worksafe WA has also drilled down the overall construction figures to identify Lost Time Injury and Diseases (LTI/Ds) workers compensation claims for the housing and civil construction sectors as separate entities. Residential building construction is classed as ANZSIC code 4111 (housing) and 4112 (residential buildings under 3 storeys); civil construction (roads and bridges, for example) is classified as ANZSIC code 4121.

Table 2 displays the LTI/Ds for the construction industry in WA per 1,000 workers. The overall total for one or more days lost time injuries/diseases are decreasing since a peak in 2006-07. Housing construction has shown a steady reduction; however, residential building construction (which includes construction of multiple storey residences up to 3 storeys) and road and bridge construction

(civil construction) have had an increase in 2008-09 and these figures are incomplete. Housing construction completions have reduced in Australia as a consequence of the Global financial crisis. In the civil construction sector and the residential building construction sector there has been a rising trend in the 2008-09 year compared to the previous year and these figures are incomplete. However the numbers for 2007-08 and 2008-09 are less than the 2006-07 where injuries peaked.

*Insert table 2 here*

Between 2003/04 and 2006/07 employment grew in Australia as did overall incidence of fatalities from injuries sustained while working from 2.6 deaths per 100,000 employees in 2003/04 to 2.8 deaths in 2006/07. Table A2, appearing in the appendix, shows statistics of all Australian worker fatalities in 2006/07. Construction fatalities from injuries sustained by working in 2006/07 in Australia are the highest for all industries with 53 of workers dying in 2006/07. In addition the number of non-fatal claims in the construction industry in 2006/07 was 13,965; making construction the third highest industry with injured workers (Safe Work Australia, 2009). This indicates a rising trend in workplace fatalities in the construction industry, although it is not a significant increase given the significant number of new commercial construction projects in WA during this time.

Between 1997/98-2006/07 the construction industry had the second highest number of fatalities resulting from workplace injury and fatalities resulting from workplace disease, and had a worse record than all Australian industries except mining. In NSW occupations that experienced the highest incidence rate of work related fatalities during 2006/07 were road and rail transport drivers, skilled agricultural and horticultural workers, and construction trades persons (13.6 per 100,000 employees (New South Wales Workers Compensation Statistical Bulletin, 2006/07, p.7).

### **Questionnaire findings**

An online questionnaire was developed with the reference group and distributed in December 2010 to 821 recipients: CEOs and supervisors in the housing and civil construction sectors addresses supplied by the HIA and CCF databases. Only 6 surveys were completed online. In order to increase

the response rate the same survey was posted in April 2011 to the 821 recipients, 45 questionnaires were completed. Combining all surveys we had a 5.5% completion rate. The low response rate is an indication that online questionnaires and mailed surveys are not supported by a participant group that is particularly manual in their work practices, not regularly working with computer and perhaps over surveyed. The response to the online survey is a specific result that the research team will investigate further in relation to response rates, methods of distribution and the characteristics of subject groups. However, even with the low response rate saturation of responses was reached. 36.5% of the completed surveys were from companies operating in the commercial sector; 25% in the civil sector and 38.5% in the housing sector. 60% of the completed surveys were from companies operating in the Perth metropolitan area; 31% in regional WA and 5% in remote areas in WA. Of those surveyed 10% had been employers for under five years, 20% employers 6-10 years, 22% employers 11-15 years; 17% employers 16-20 years and 27% employers for 20 years and over. The numbers of employees the surveyed companies employed ranged from 1-300 employees. 58% employed under 20 employees (micro-sized companies); 29% employed between 20-49 employees (small sized companies), 8% employed 50-199 employees (medium sized companies), and 5% employed 200+ employees (large sized companies).

Table 3 illustrates the responses to the statement that the CIT provided a good first step to developing safety awareness for their staff. 33% of respondents strongly agreed, 45% agreed, and 12% were undecided. However, 6% disagreed with 4% strongly disagreeing with the statement.

*Insert table 3 here*

The respondents were asked whether they believed that the CIT provided benefit to their staff. 53% agreed with this statement and 16% strongly agreed. 18% were undecided. However 8% respondents disagreed and 4% strongly disagreed (Table 4).

*Insert table 4 here*

The respondents were asked if they perceived that after their staff completed the CIT there was a measurable benefit to their business. 37% agreed with this statement, with a further 12% strongly agreeing and 30% undecided. However, 20% of those surveyed report no measurable benefit to their business by completion of the CIT by their employees (Table 5).

*Insert table 5 here*

45% of respondents believe that the CIT assisted their business by reducing accident/incident rates. 55% of respondents did not (table 6).

*Insert table 6 here*

In summary, the sample indicated in general that the training was valued as a first step in safety awareness for the industry. Figure 2 shows that 90% of the sample accepts that the cost of the training is minimal with assistance of the CTF. 95% of the sample agree that trainers should have industry experience, 97% believe they should have a formal qualification and 100% value trainers with accreditations and industry compliance. 78% believed the CIT is 'a good first step' to safety awareness for the industry. 81% stated there was adequate time spent by trainers delivering the course. 79% believed the CIT provided benefit to their staff. 49% believed that by having their staff complete the training there was a measurable benefit to their business. 45% stated that the training assisted their business by reducing accident rates; however 55% of the sample disagreed with this statement. Although there were several negative comments about the online training delivery mode 36% of the sample looked for this type of delivery when they chose a training provider.

*Insert figure 2 here*

The interview stage of the study is currently underway and this will provide deeper evidence of how the CIT is received and what forms are the most successful in learning terms for the industry

participants. It is this final stage that will contribute to assessing if what appears to be a successful mandatory approach to learning has developed more relevant and participative modes of delivery.

### **CONCLUSION**

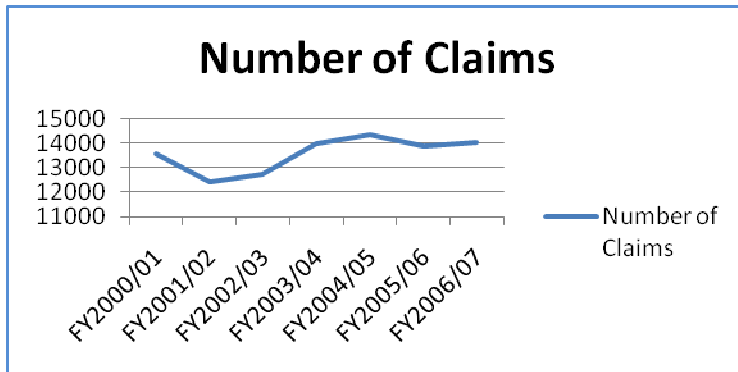
Work-related fatalities and injuries are on the rise in the housing and civil construction industries; however, Western Australia has just been through a construction boom with a significant increase in construction projects requiring an increase in workforce numbers. It is expected that with the increase in workers in the industry there would have been a more significant increase in LTI/Ds. While there can be no hard evidence of the extent to which the CIT is responsible for decreasing LTI/Ds, this study provides evidence that the introduction of pre-site safety training has gained broad acceptance within the industry. The current form of mandatory learning has contributed to increased safety awareness across the industry and has contributed with other changes to have a positive impact upon safety within the industry.

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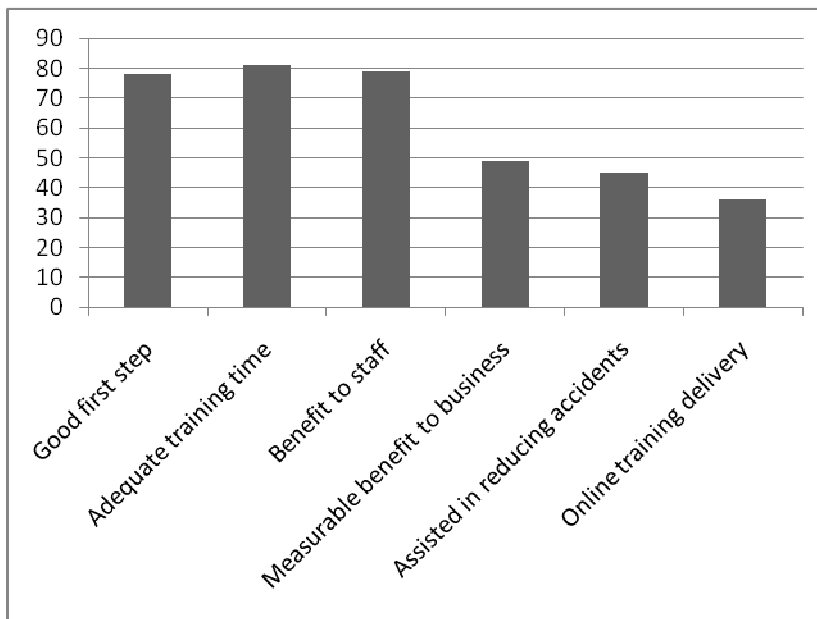
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FIGURES



Source: Adapted from Safe Work Australia, 2010

**Figure 1: The number of workers compensation claims 2000/01 – 2006/07 for all Australian workers in construction**



**Figure 2: Percentage of sample who reported benefits of the CIT**



## TABLES

**Table 1: The Sample**

Instrument	Sample frame
Incident Statistics	Tabulation and segmentation of the Housing and Civil Construction sectors records from Worksafe WA for the previous 6 years – Pre and during the Construction Induction Training scheme.
Questionnaire	Online distribution to HIA and CCF Memberships of approximately 821 CEOs and supervisors – 6 completed.  Mailed survey to HIA and CCF Memberships of approximately 821 CEOs and supervisors - 45 returned completed.

**Table 2: ANZSIC 1993 Edition codes 4111 House Construction, 4112 Residential Building Construction, and 4121 Road and Bridge Construction: LTI/Ds 1+ days lost**

Financial Year	House Construction	Residential Building Construction nec	Road & Bridge Construction	Total
2004-05	172	31	115	318
2005-06	166	34	152	352
2006-07	220	64	177	461
2007-08	211	51	152	414
2008-09p	193	58	159	410
<b>Total</b>	<b>962</b>	<b>238</b>	<b>755</b>	<b>1955</b>
5yr Avg	192.4	47.6	151	391

Source: Worksafe WA, May 2011

**Table 3: CIT is a good first step**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid SD	2	4.0	4.1	4.1
D	3	6.0	6.1	10.2
N	6	12.0	12.2	22.4
A	22	44.0	44.9	67.3
SA	16	32.0	32.7	100.0
Total	49	98.0	100.0	
Missing System	1	2.0		
Total	50	100.0		

**Table 4: Benefit to staff**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid SD	2	4.0	4.1	4.1
D	4	8.0	8.2	12.2
N	9	18.0	18.4	30.6
A	26	52.0	53.1	83.7
SA	8	16.0	16.3	100.0
Total	49	98.0	100.0	

Missing System	1	2.0	
Total	50	100.0	

**Table 5: Measurable benefit to business**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid SD	4	8.0	8.2	8.2
D	9	18.0	18.4	26.5
N	13	26.0	26.5	53.1
A	17	34.0	34.7	87.8
SA	6	12.0	12.2	100.0
Total	49	98.0	100.0	
Missing System	1	2.0		
Total	50	100.0		

**Table 6: CIT reduced accident/incident rate**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Yes	22	44.0	45.8	45.8
No	26	52.0	54.2	100.0
Total	48	96.0	100.0	
Missing System	2	4.0		
Total	50	100.0		