M. RAJ, K. VARGHESE. ***Positioning of human resources in a construction environment using Zigbee.*** *Gerontechnology 2012;11(2):418;* doi:10.4017/gt.2012.11.02.290.00 **Purpose** The purpose of this work is to explore the feasibility and accuracy with which people can be located in a construction site using Zigbee technology. Such positioning systems will enable the tracking of workers and this is critical in work areas such as tunnels and other constrained spaces which can be hazardous. Furthermore, such systems can detect worker congestion and work in unallocated areas which can lead to better planning and improved productivity. Earlier work on positioning has explored technologies such as GPS, RFID, WLAN, Bluetooth[1-3]. The cost associated with most of these methods has been significant and limits widespread use within a construction site. Hence configuring a cost-effective technology was also a key requirement of this study. **Method** The investigation was done in three phases[4]. In the first phase the Zigbee system was configured in a laboratory environment and accuracy of positioning was established. In the next phase, the system was mounted on a construction helmet and tests were conducted within enclosed spaces of a construction site. In the final phase the system mounted on a helmet was worn by a worker and tested outdoors on a construction site. In all phases the factors affecting the position accuracy were analyzed. **Results & Discussion** The seven positions identified in the table of the final phase of investigation correspond to the division of the site into grids (*Table 1*). The total number of positions evaluated and the number of these positions which were correctly classified are specified in the table. It can be seen that the accuracy of the classification ranged from 74.3% to 93.3%. It was found that the accuracy varied based on the distance of the position from transmitters as well as proximity of the position to the edge of adjacent grids. Based on these investigation guidelines on the configuration and usage of Zigbee based networks for positioning construction personnel were developed. In addition to the technological feasibility a cost comparison was also done and it was found that the Zigbee technology could be implemented at about 1/10th of the cost of WLAN and other technologies. Although this technology was only tested on construction workers it is directly applicable for location of other subjects such as differently abled or elderly persons whose location needs to be monitored remotely.

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Table 1. Accuracy of system at test positions in actual construction site

Position	Total tests	Correct	Accuracy, %
1	32	26	81.3
2	35	26	74.3
3	26	21	80.8
4	28	24	85.7
5	33	27	81.8
6	30	28	93.3
7	33	26	78.8
All Positions	217	178	82.0