Two general strategies for reducing the risk of developing work-related musculoskeletal disorders are engineering and administrative controls. Engineering controls involve physical manipulations of hazards or routes of exposure to physical hazards while administrative controls change the duties or the design of the job (Norman and Wells 2000). Engineering controls are the preferred strategy because they diminish the exposure. However, if an engineering control cannot be implemented immediately, or, not at all, than an administrative control may be used. Job rotation is frequently recommended as an administrative control for reducing musculoskeletal injury risk and fatigue (Jonsson 1988, Putz-Anderson 1988, Vander Doelen and Barsky 1990, Hazard et al. 1992, Wands and Yassi 1993, Grant et al. 1997, Kuijer et al. 1999). Many benefits have been ascribed to job rotation, including: a cross-trained workforce, increased motivation/innovation, reduced boredom and monotony, reduced work stress, reduced absenteeism, lower turnover rates, increased ability to handle change, increased production and reduced cumulative trauma disorders (e.g. Triggs and King 2000). However, a review of the literature did not find any studies which had rigorously evaluated job rotation in order to quantify its benefits in reducing risk factor exposure.

The general principle of job rotation is to alleviate the physical fatigue and stress for a particular set of muscles by rotating employees among other jobs that use primarily different muscle groups (US Department of Labour, 1993). For example, an employee may unload pallets at one workstation, primarily a low back challenge, and then rotate to another station and perform light assembly work, primarily an upper limb challenge. The rotation may occur at fixed intervals within a day, such as every 2 h, or changes may occur between days. Rotation schedules that involve different operational tasks but use the same muscle groups and joints in the same way from task to task cannot be expected to have a risk reduction benefit (Jonsson 1988, Van Velzer 1992, Wells et al. 1995).

It has been proposed that by decreasing the amount of time the same muscle groups and joints are exposed to loading, the physical workload is reduced for any one worker (Putz-Anderson 1988, Vander Doelen and Barsky 1990, Wands and Yassi 1993). It is assumed that by spreading high loads over several workers, rather than having the same worker exposed continuously to high risk, that the risk is averaged over the workforce and an overall reduction in risk occurs. Indeed, this may be the case for individuals who rotate out of high demand positions and decrease their exposure, but job rotation also requires that other workers rotate in to fill these positions. Therefore, rotation results in more individuals becoming exposed to the risk factors (Henderson 1992, Stoffman and Sykes 1999). In order to determine the effects of rotation on injury risk it is necessary to first quantify the risk of injury for performing those jobs that do not involve rotation but that would be included if a job rotation schedule were implemented. The risk of injury associated with performing the job(s) created by rotation must then be quantified. Comparing the injury risk estimates between these two scenarios allows the effects of job rotation to be evaluated.

The Low Back Pain Reporting (LBPR) approach is a strategy that the authors have developed, and are reporting in this paper, to ensure that both peak and cumulative spinal loading risk factors are considered when analysing a job. The strategy utilizes a custom software program (4D Watbak, University of Waterloo, Waterloo, ON, Canada) to quantify the peak and cumulative loading exposure experienced when performing a job for an entire shift. The magnitudes of these risk