



UNIVERSITY OF  
**TORONTO**

# MIE1411H

## Ankh Morpork Postal Service Case Study Check-in

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## **1. Introduction**

The Ankh Morpork Postal Service (AMPS) has witnessed a significant shift in its operational dynamics over the past decade, with approximately one-third of its deliveries now comprising packages. This shift necessitates a thorough assessment of the ergonomic challenges associated with package handling within specified weight and size limits.

## **2. Physical Demands and Workplace Context**

The workplace context for AMPS mail carriers encompasses various factors such as task requirements, environmental conditions, equipment usage, and ergonomic considerations. These carriers are responsible for delivering both letters and packages within designated geographic areas, utilizing their trucks as operational bases. The physical demands of their role include lifting and carrying packages of up to 30kg, as well as navigating through diverse weather conditions similar to those experienced in Toronto. This case study will focus primarily on tasks associated with delivering letters and parcels, once the truck has parked a desired destination to deliver packages to a geographical area.

## **3. Analysis Approach**

Integrating various ergonomic assessment methods to comprehensively evaluate the challenges faced by AMPS personnel, with a primary focus on mitigating musculoskeletal disorders (MSDs).

### **a. REBA (Rapid Entire Body Assessment)**

This systematic method will allow for a quick evaluation of the entire body posture during package handling tasks, helping to identify ergonomic risk factors and potential improvements.

### **b. National Institute for Occupational Safety and Health (NIOSH) Lifting Equation**

$$RWL = LC \times HM \times VM \times DM \times FM \times AM \times CM$$

This would allow us to determine what the safe lifting limits would be. It considers twisting while lifting and hand-container coupling.

### **c. Liberty Mutual - Manual Material Handling Equations**

This could assess manual material handling tasks to determine ergonomic stressors and percentage of the populations suitable for the task. It includes the Snook & Ciriello data and considers pushing, pulling and carrying factors lacking in the NIOSH equation.

### **d. The Arm Force Field**

This can be used to predict manual arm strength (MAS) required for a wide range of body orientations, hand locations and forces applied in any direction.

- e. American Conference of Governmental Industrial Hygienists (ACGIH) Screening Criteria for Heat Stress Exposure

This heat stress screening tool will determine the level of heat stress exposure for workers.

## **5. Conclusion**

In conclusion, as the Ankh Morpork Postal Service (AMPS) adapts to increased package deliveries, it's crucial to address ergonomic challenges. AMPS mail carriers face physical demands like handling packages up to 30kg and navigating diverse weather conditions.

This analysis approach integrates various ergonomic assessment methods to minimize acute and chronic musculoskeletal disorders including slip-and-fall injuries. An outdoor environment assessment is warranted to identify additional hazards for the worker, specifically heat stress. From these assessments we will recommend implementing ergonomic training programs, enhancing or modifying equipment, and introducing weather protection measures to ensure personal safety.