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Focus on IFA's work

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Ergonomic redesign of a crane operator workplace in a waste incineration plant

Problem

Crane operators in a newly constructed waste incineration plant (M1) complained about pain in the neck, shoulders and upper limbs. They suspected the cause to be the forward inclination of their working posture as they observed the waste grabber which they were operating.

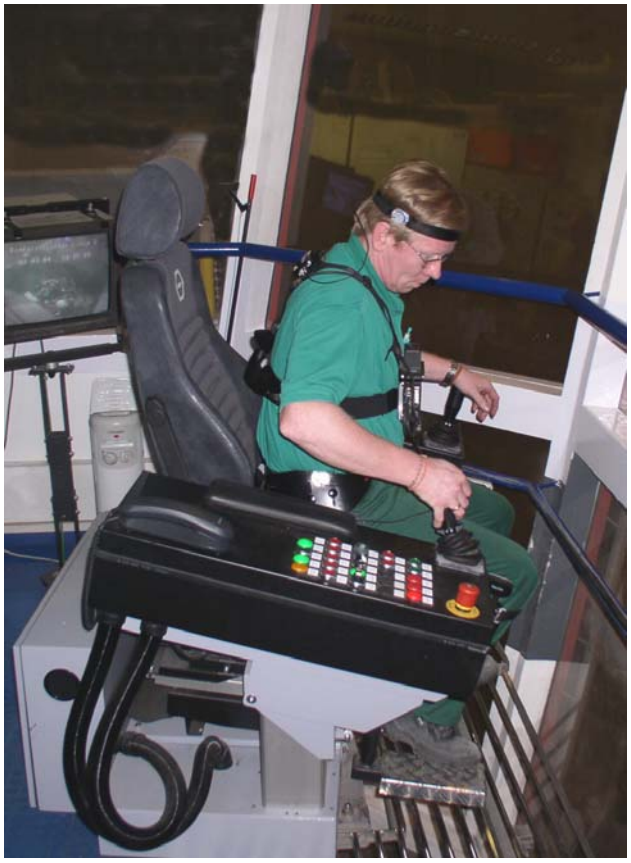
Since such complaints did not occur in another plant of supposedly identical design (M2), the company contacted the then Berufsgenossenschaft der Gas-, Fernwärme- und Wasserwirtschaft (BG responsible for the gas, domestic heating and water supply industries – BGFW), and ordered an ergonomic comparison of the two workplaces.

Activities

In 2001, preliminary studies were conducted in both plants. The IFA was given the task of measuring the crane operators' body postures. The researchers employed the CUELA personal measurement system (computer-assisted measurement and long-term analysis of musculoskeletal load) in order to record the positions and movements of the head, spine, pelvis and legs. The shoulder and arm movements were identified by analysis of the accompanying photographic and video documentation.

Results and Application

The analysis revealed that the crane operators in the new plant (M1) were required to work far more frequently and for longer periods in unfavourable postures than were their colleagues in the older plant (M2). In particular, they were required to work longer with the trunk inclined strongly forwards, neck bent, and shoulders hunched.



Crane operator with new seat and measurement system

The causes of these unfavourable, static body postures were to be found in the position of the crane operator's cab within the plant, and in the

crane operator's seat and control elements, which were poorly suited to this work.

Since changes to the design of the entire plant were no longer possible, the proposals for improvement focused upon a redesign of the crane operator seat. It was recommended that the seat and control elements be modified such as to permit forward tipping.

Following development and installation of a suitable seat, measurements were taken again in 2004 for evaluation of the intervention. A before-and-after comparison of the body postures in plant M1 revealed considerably improved results for the head, neck and shoulder regions. Consultation with the crane operators also revealed a considerable drop in the complaints previously expressed.

Since the acceptance of the new workplace was unreservedly high among the crane operators consulted, the intervention may be regarded as an example of successful combination of research and practice.

Area of Application

Operators of crane operator workplaces

Additional Information

- Ditchen, D.: Redesign of a crane operator seat in the waste incineration industry. In: Work-related musculoskeletal disorders: Prevention report. Ed.: European Agency for Safety and Health at Work. European Communities, Luxemburg 2008, pp. 50-53

Expert Assistance

IFA, Division 4: Ergonomics – Physical environmental factors

Literature Requests

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