

AUTOMATION OF VISUAL INSPECTION

Organisation

Slovalco, a.s.

Introduction

Aluminium manufacturing needs anodes made of carbon. The plant produces anode blocks composed of calcinated petrol-coke, liquid coal tar pitch and mix of scrap material. Mixed material is formed to block-shaped anodes by a vibrating compactor. Blocks are around 0.5 m high, over 1.5 m long and weigh one tonne. A worker used to stand at the end of the production line for the whole shift visually inspecting the blocks to detect manufacturing defects such as cracks or holes. Output is around 20 blocks per hour so every three minutes the worker inspected a block and had to squat down to the level of the block to mark the block with the identification number. There is a draught at the workplace and it is cold in the winter. There were 12 persons rotating in this position from the 80 workers of the production unit.



Figure 1 Marking the block with chalk in squatting position

Photo by Slovalco a.s.

Aims

The company decided to redesign the visual inspection process in order to achieve better working conditions. The direct targets were the unfavourable working conditions: 8 hours standing, bending over 29,813 times a year while marking the blocks, draught and cold working environment in the winter. Further targets were the burden of musculoskeletal disorders (MSDs) and the sickness rate due to cold.

What was done, and how

The company has installed video cameras besides the conveyor. The video signals are sent to a separate control room. A high-pressure painting device with a printer replaced the marking of blocks with chalk. There was no problem encountered.



Figure 2 Workers inspect a block from the control room

Photo by Slovalco a.s.



Figure 3 Automated printing device marking the blocks. Photo by Slovalco a.s.

What was achieved

Risks from unfavourable ergonomic conditions were eliminated. Workers can inspect blocks from the comfort of the control room. Industrial cameras have eliminated the need to stand for 8 hours beside the conveyor. The painting-printing machine has replaced squatting down for marking. Workers have to go out to the conveyor area only once an hour. They reject faulty blocks at the end of the shift by pressing a button. The one-off investment costs of the high-pressure painting device, the printer and the camera system were SKK 1,485,721 (c €44,200).

The intervention is part of a programme of changes that aim to improve working conditions in the production line. In ten years, sickness absence rate fell from 3.10% to 1.85%.

Further information

Slovalco, a.s.

Priemyselná 14, SK 965 48 Žiar nad Hronom, Slovakia

Tel: (421-45) 608 99 99

Fax: (421-45) 608 88 88

Contact person: Jozef Pilnik

Email: jozef_pilnik@slovalco.sk

www.slovalco.sk

Transferability

This practise can be easily transferred to other companies involving similar tasks.