

Portal to Digital Ergonomics

Through 'Portal to Digital Ergonomics' TNO Human Factors provides ergonomic consultancy to companies dealing with physical ergonomic issues. Nowadays communication technology suits well with the digital character of the TNO evaluation tools and makes it possible to provide this service via Internet. Technically speaking TNO acts as an Application Service Provider (ASP), meaning that a company gets served on demand, without having to train its employees or having to buy expensive tools. Consultancy by TNO can be best called in early in the design process because our digital techniques then employ their greatest advantage. The business model proposed means that a company sends a CAD file of a design to TNO, accompanied by descriptions of the future user population and the tasks they will execute. TNO analyses the modelled physical interaction between the user and the design, and returns the evaluation results, as well as options for design improvements, if any.

CASE: Maintenance of irrigation pipes in a gas filter system

On request of JGC Dordtse Engineering BV, a company operating in the process industry, a physical ergonomic evaluation was carried out on maintenance of irrigation pipes in a gas filter system. The heaviest task is to manipulate the long irrigation pipes by removing them from and placing them back into the filter. The heaviest part of the pipe reaches far out of the platform.

Product – Users – Task

Product

A filter with thirteen irrigation pipes which have to be removed for maintenance twice a year.

Users

country: Europe

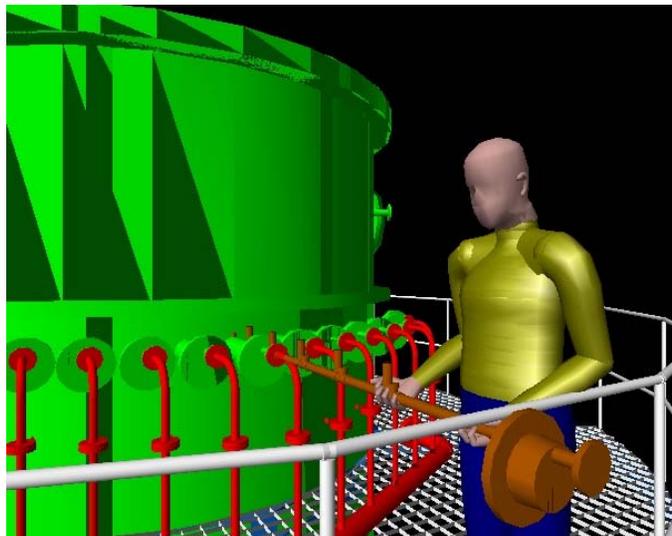
sex: male & female

age: 18-65 years old

Task

Moving the irrigation pipe in a straight line out of the filter and putting it down on the platform.

Replacing parts, lifting the pipe outside of the platform and rotating it in order to move it in a straight line back into the filter.



Evaluation & advice

Simulation software for Virtual Environments has shown that the irrigation pipes cause interference with the railing. The interference makes it impossible to take the pipes completely out of the filter. Evaluation of the workload with the internationally known NIOSH-method has shown that problems appear due to the distribution of the weight of the pipes, due to the removal of the pipes in a straight line and due to the limited space on the platform. Based on this evaluation TNO has given the following advice:

- Create an optimal work height for removing the pipes from the filter at 75 cm above the platform. This means that the plateau has to be positioned 25 cm higher. Consequently, the pipes will not interfere with the horizontal railing anymore.
- Develop a holder to be placed under the horizontal railing in order to support a pipe at the height of 75 cm above the platform during the removal.

Conclusion

The complete physical ergonomic evaluation for JGC Dordtse Engineering has been carried out within one day. The filter system was improved by JGC Dordtse Engineering in the early stage of the design process.

Information

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