



# SAFETY \$AVES

Equipment safety is a non-negotiable priority on pipeline construction jobsites. **Lycke Koersen, Maats, the Netherlands,** discusses how the benefits of equipment safety stretch from safe operation to economical savings.

Over the years, safety and health requirements have been standardised through numerous legislations. Equipment safety has shown massive growth in technique and solutions and the developments have kept manufacturers on top of the subject in designing and building equipment. Maats and Liebherr have always had safety high on their priority list. As a result, they occupy a leading position regarding inventive safety solutions and providing a comprehensive understanding of the added value of equipment safety. Providing a safe working environment will always be the main goal of safety measures, but the integration and optimisation of equipment safety presents clear benefits that go far beyond assuring the well being of operators and surrounding personnel.

#### **Safety solutions**

Maats and Liebherr have optimised equipment safety over the years through extensive research and development of new solutions. Numerous safety features and systems are specially developed and refined to assure safety during operation. Obvious primary safety features on Maats and Liebherr machines include the emergency stop, safety lever, ROPS/FOPS cabin, free fall device, load monitoring system and the logically situated safety steps



and handles. In addition, less obvious ingenious safety concepts are perfectly integrated in the machine layout. For instance, the boom with the hydraulic cylinder on the pipe layers is one of the 'hidden' features that contributes to machine safety. The cylinder allows for precise and accurate operation of the boom, and the boom and cylinder structure as a whole is designed to hold the weight of the machine, preventing it from rolling over in case the machine tips towards the load side.

Another important safety aspect is incorporated in the technical layout of the machines. Through highly economical and reliable wear-free systems (for example, a hydrostatic travel drive, load sensing hydraulic system) and by using high quality materials, risks of accidents due to breakage or technical failure are minimised, adding to the reliability and operational safety of the equipment.

Also incorporated in the machine layout are the ROPS cabin and the safe and efficient operating elements. The safety value of the enclosed cabin includes the 4point ROPS-structure as well as protection from weather, dust, noise and vibrations. By locating all operating elements in one place, the operator is provided with the safety and comfort of commanding all machine movements from one place. The

sensitive and precise control of the intelligent hydraulics allow for millimetre accurate control of all machine movements, adding an important value to safely carrying out work with the machine.

As the level of quality with which the machine is maintained is important to operational safety, the technical layout is optimised for maintenance. Maintaining the machine to the best possible level is the only way of assuring that all safety and reliability intended measures will optimally function. To allow thorough, safe and quick performance of all daily check-routines and other maintenance tasks, the technical layout is kept straight forward, low maintenance and wear-free. All maintenance points are guarded or enclosed for safe and quick reach, keeping maintenance easy.

With all safety features combined, Maats and Liebherr aim to provide the safest environment in all operating conditions. By securing safety and ease of operation and maintenance, the risk of accidents is highly reduced and circumstances are created in which all activities can be performed with the highest possible efficiency.

### Safety incorporated

Maats and Liebherr equipment is known for its high quality and reliability, two themes that automatically go hand in hand with safety. A significant part of the ingenious safety concept of Maats and Liebherr machines starts early on in the design phase.

Along with optimising the technical layout of the machine, adequate safety factors are incorporated into the calculations and high quality materials are used in the design. The use of Liebherr components is beneficial for both safety and economy. The high quality Liebherr components have long service lives and can be optimally integrated in the system. This perfect match in operation provides maximum technical reliability. Safety is optimised by minimising the risk of technical failure and, by effectively reducing downtime and maintenance costs, economy is increased.

Putting special care into the design and regarding operating conditions such as temperature, ground conditions



**Figure 1.** Boom and boom-cylinder, one of the 'hidden' but majorly important safety features on Liebherr and Maats pipelayers.



**Figure 2.** Operational safety and performance of the Liebherr RL54 are optimised through innovative solutions, high quality materials and the ingenious technical layout.



**Figure 3.** Maats bending equipment; The unique high strength of the construction is developed to withstand high bending forces and guarantee safe operation in all possible climates. The machine is equipped with numerous safety features and the layout is optimised for safety.

and stability, further eliminates the risk of accidents and technical difficulties. Risks caused by external influences are eliminated by optimising the layout (for example, an extreme low centre of gravity to assure stability), incorporating specially selected materials (for example, special steel quality to resist extreme temperatures) and using special components throughout the design (for example, the pipe layers' wide tracks for outmost stability). This allows the machine to be safely operated and remain fully operational, even under difficult circumstances.

By incorporating safety as a key element throughout the entire design process, quality and efficiency is guaranteed and a highly important value is added to both operational safety and economy.

### **Understanding = safety**

Incorrect use of equipment can easily lead to dangerous situations, accidents and costly downtime. To fully benefit from the intended effects of any safety measure, it is important that the equipment is controlled in the correct manner. A large part of equipment safety is formed by the information that is provided to the operator. Therefore, to ensure safe operation, an operator must fully understand the possibilities and capacity of the machine.

The first step towards such understanding is the quality of instructions and information provided to the people working on the machine. Through adequate commissioning, instructions and onsite training, Maats and Liebherr provide service personnel and operators with the knowledge they need to optimise both operational safety and performance. A well instructed operator is able to safely perform tasks and use the machine to its fullest potential.

The second step towards safe operation is the layout of operating elements of the Maats and Liebherr machines. The well balanced operating elements have a simple and logical layout that allows for intuitive use. The comfort of initiating all primary machine movements with ease raises the level of safe operation as the operator is able to focus on the tasks to be carried out.

A comprehensive understanding of how to operate a machine means a good understanding of risks, the ability to avoid dangerous situations and the capacity to optimise safe operation, economy and efficiency of the machine. Combined with the precise and intuitively controllable operating elements, the operator is provided with the right know-how and tools to largely increase productivity and performance.

### **Comfort is not a luxury**

Highly contributing to the safety and efficiency of machine operation are ergonomics and comfort, but both are generally considered as being

mainly favourable for the employee. Paying attention to an ergonomically correct workspace is often seen as an imposed obligation, and providing an additional level of comfort may be dismissed as a luxury. Such perceptions largely underestimate the benefits that can be gained by the employer.

Allowing the operator to carry out his work free of injuries is initially a health issue, but pays off on several other fronts as an ergonomically correct and comfortable workspace contributes to both the safety and the efficiency with which the machine is operated. By eliminating risks such as injuries, fatigue and distraction of external and circumstantial factors, the operator is allowed to fully concentrate on his job. This means fewer mistakes and a highly optimised performance.



**Figure 4.** The Liebherr SR714 welding tractor has an extra long undercarriage, wide track shoes and extreme low centre of gravity, providing utmost stability and low ground pressure to guarantee safe operation and optimal use in all ground conditions.



**Figure 5.** The Liebherr SR714 consists of numerous innovative solutions such as the fully hydraulic-driven concept, several emergency stop buttons, centrally located function controls and ROPS cabin with heater and air conditioning.



Maats and Liebherr profoundly contribute to raising the level of comfort and ergonomics by paying attention to the basics, including seating comfort (air suspended seat, adjustable seat elements), visibility (all-round vision cab, tilted seat for comfortable and clear view on the load) and logical controls (precision controls, intuitive single-joystick control). Adding additional features such as air-conditioning, additional working lights and a back-up alarm are also examples of relatively small adjustments that increase operator performance. If operators are given the right tools, they are able to perform their work to the best of their abilities, regardless of any external conditions

Even though it is often presumed to be costly and complicated, raising the level of comfort and ergonomics actually concerns slight adjustments that can be easily made. In addition, the adjustments will contribute to safe operation and are proven to be profitable. An operator that works in a conditioned, comfortable environment is able to perform with greater levels of concentration. Therefore, providing an operator with a clean, safe, comfortable working environment and the correct tools will help to accelerate and optimise safety, production and productivity.

## Summary

The clear benefits of equipment safety stretch from safe operation to economical savings. Over the years, the importance of equipment safety has evolved from being underestimated to being highly profitable. It is now considered as one of the key aspects in defining the quality of pipeline construction equipment.

Maats and Liebherr incorporate safety and provide quality pipeline equipment through an interplay of various factors and innovative solutions. By emphasising quality and safety on all levels, factors such as technology, reliability, economy and efficiency automatically stimulate one and another to higher levels. Pipeline construction equipment is an important and valuable factor in pipeline projects and by assuring quality, Maats and Liebherr machines allow equipment to be utilised as a highly profitable stepping stone in the complex process of pipeline construction.

In synergy with all other major focal points, safety is a proven and significantly important factor in serving the main purpose of pipeline construction equipment: adding an important value to the profitability of your project. 