УДК 811.111:621.865.8

SAFETY IN ROBOTIC PRODUCTION

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The development of robotic systems leads to the need for creation of new human secure systems and standards that will define relationships between a human and a robot within robotic manufacturing.

According to the research of injury cases in German enterprises every few days an employee working directly with robots gets into dangerous situation. Every 40–50 dangerous situations lead to an accident. About 16 % of injuries are head injuries which have the greatest danger. The largest number of accidents happens during direct work with robots such as reprogramming, repairs, tool installation and removing. That's why it is really important to develop the rules of safe work with industrial robots. One of the most crucial standards was made in 2011. It is called "ISO 10218 Robots and Robotic Devices – Safety Requirements for Industrial Robots". This standard laid the basis for safe interaction with robots. This kind of standards updates every five years. The extended standard called ISO/TS 15066 was published in 2016 and it is the main standard now. The main difference from the pr**e**vious standard is the description of sensitivity threshold of human body parts which allows manufacturers to develop force-limiting systems.

The first industrial robots could move only according to the program and there was no difference for them if there was a person in front of their trajectory. This kind of robots is used even now. And in this case the most important thing for human protection is to divide industrial robot and human workspaces. Also we can program a robot in such a way that it will have information about safe and dangerous stages of work for human being. Basically light indicators will be provided to the system (red light for dangerous stages, green light for safe, yellow light for changing period). For more protection we can equip this system with controlled fence which is locked when a red indicator is on and opened when a green indicator is on.