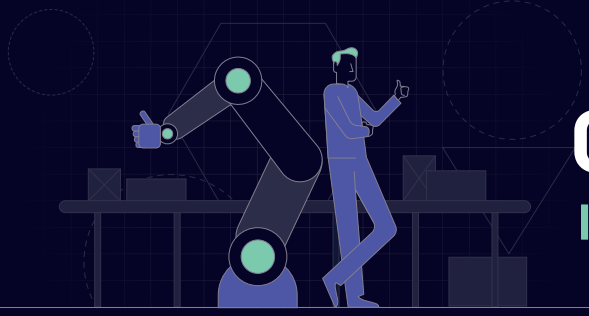


Collaborative robots

Identify risks to prevent them

Several risks identified

Risk of physical impact
Collision, crushing

Specific risks
Burns, intoxication

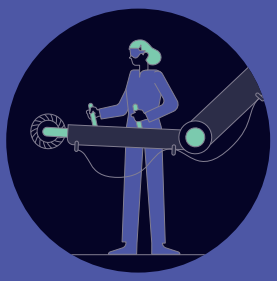
Risk of musculoskeletal disorders
Pain in wrist, shoulder, back...

Psychosocial risks
Mental overload, isolation

Organisational solutions

Training

Develop new skills.



Activity monitoring

Limiting awkward postures.

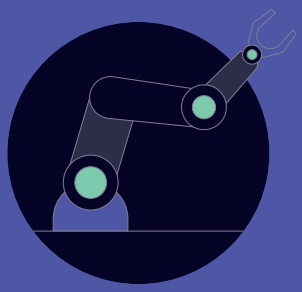
Change in organisation

Rethink collective work.

Technical solutions

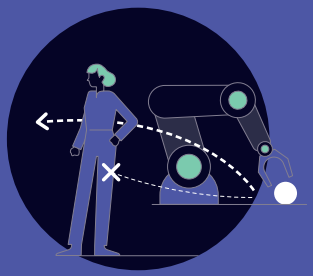
Limit on power and effort

The robot stops immediately in case of collision.



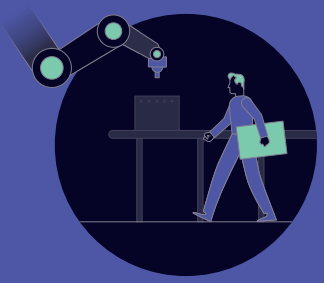
Changes to the robot's physical characteristics

Lighter weight, no sharp edges or angles, no risk of jamming.



Speed and separation monitoring

The robot avoids the operator if necessary using another trajectory.



Safety-rated monitored stop

The robot slows down when the operator gets closer and stops if necessary to avoid collision.

Other risk reduction measures (physical barriers, light curtains, etc.) should be added to these solutions if needed.

Conception : L'Unique Équipe - Septembre 2020

More information at: **inrs.fr/robotscollaboratifs**

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