



2024 HSE & CSR Workshop

«Human-Machine Interfaces»

Answers to the questions



1. What is **d**angerous (in the human-machine interaction dynamic)?

Danger	Potential Solution
Unexperienced people / Operator.	Training.
Different way of communication.	Alignment in standards / signals.
Line of authority.	Right of withdrawal (Stop work Authority).
Overconfidence about experience.	Award correct behavior.
Lack of Inspections / Maintenance.	Safety Due register.



2. What do we do that is difficult (to implement or work around)?

Difficulty	Potential Solution
Convincing employees to utilize new safety equipment.	Training personnel about the benefits of the new technologies and equipment is for their own safety instead of controlling them.
Making time for equipment training / maintenance,	Management has made the investment but now needs to make the time to provide the proper education on how to use the equipment by training.
While working in various environments and outdoor conditions personnel are not recognizing transitions in temperature, soil, slopes, etc.	Recognizing changes in environments and outside conditions. Create protocols to make adjustments.
Overconfident in machinery. Machine failures.	Create protocols to calibrate and maintain regularly. Create Preventative maintenance schedule.
Language barriers. Improper language on equipment user interfaces and OMM's (operator maintenance manual).	Verify that there is proper language on OMM documentation and equipment user interface for each country working in.
Bottle necks in pipeline construction creates stress physically and financially.	Pre job investigations into where these bottlenecks potentially are and how to prevent. Possibly use AI?



3. What do we do that **doesn't** make sense (in application today)?

Doesn't make sense	Potential Solution
Now that we have digital dashboards it does not make sense to have machine controls and dashboards in a single language.	Demand equipment manufacturers offer multi language user interface options like on other digital devices.
It doesnt make sense to jump from the machine.	Increased awareness and improved / targeted training.
Now that we have technology it doesnt make sense to use human spotters.	When appropriate use technology rather than a hu,an spotter
It does not make sense to trust technology completely.	Technology should supplement human factors not supplant human factors - trust but verify.
It does not make sense to invest in safety solutions <i>only</i> AFTER a serious incident has occured.	Be more proactive in our safety investment strategy
It does not make sense to invest in safety solutions and forego an equal investment in culture.	Always bundle « soft solutions » with hardware investment.
It does not make sense to expect people with limited real world experience vs virtual experience to adapt to real world situations.	Change expectations – and related decisons and actions.



4. What we can do differently (from what is being done today)?

Today's approach	Different approach
The risk analysis is mainly based on the operator (visual skill / camera tools) or the pedestrian capabilities to avoid the interaction leading to an accident.	The 55% risk not correctly appreciated by the operator or the possible human mistake (operator / pedestrian) could be eliminated with the support of AI / detector scans to avoid accidents.
Some detection tools are not usually installed on the equipment except when the manufacturer wants to improve its own equipment or the client requests it, as norms or standards don't require.	Having norms requiring detection tools on the equipment to improve safety standards (i.e. ABS is mandatory in Europe only since 2004).
We relay on human skills to stop other people of being in danger if they approach a working equipment → people that care about their colleagues.	The use of AI / detector scans might avoid to rely only on human skills.
Clients are usually not requesting specific approach on HMI to the contractors, while they are often focusing on CO2 reduction (stage V mandatory).	An approach common to ESG and Safety might improve working conditions: when contractors are forced to some ameliorations as their competitors, improvements are faster.



5. What do we do that is delightful (or going well)?

Delightful	Repeat and Replicate
Incident and Injury Free Jobsite / No Incidents. Pause/Stop Work Culture.	Management commitment and consistency / Resources. Participation / Behavioral Safety / Mindset.
Scheduled Inspection and Maintenance.	Clear Instructions / Color- Coding / Craft Skills.
Barricading & Human Detection Systems.	Investment and Research & Development. Job Site Awareness.
Incentive and Rewards.	Fair Culture Program / Allocation of Budget.
PTW / JSA / Start Work Check.	Training and Commitment of Personnel.
Continuous Machine and Personnel Monitoring.	Check and analyze the extracted data for development. Sharing the data analysis.
Operator Certification / Simulators.	Develop common programs for certifications (ISO), share simulator resources.
Delightful Working Conditions. Personnel and Management Favorable Interaction.	Employee Welfare oriented Company Culture and Infrastructures.