
DQRA

dynamic 3D risk watcher and activity planner

EPSC 2021

Dr. Joar Dalheim

VP Technology

Vysus Group

Vysus Group

- Carve-out of Lloyd's Register Group, LR's Energy business
- New name, same people, same competence, same commitments:
- A standalone engineering and technical consultancy, offering specialist asset performance, risk management and project management expertise

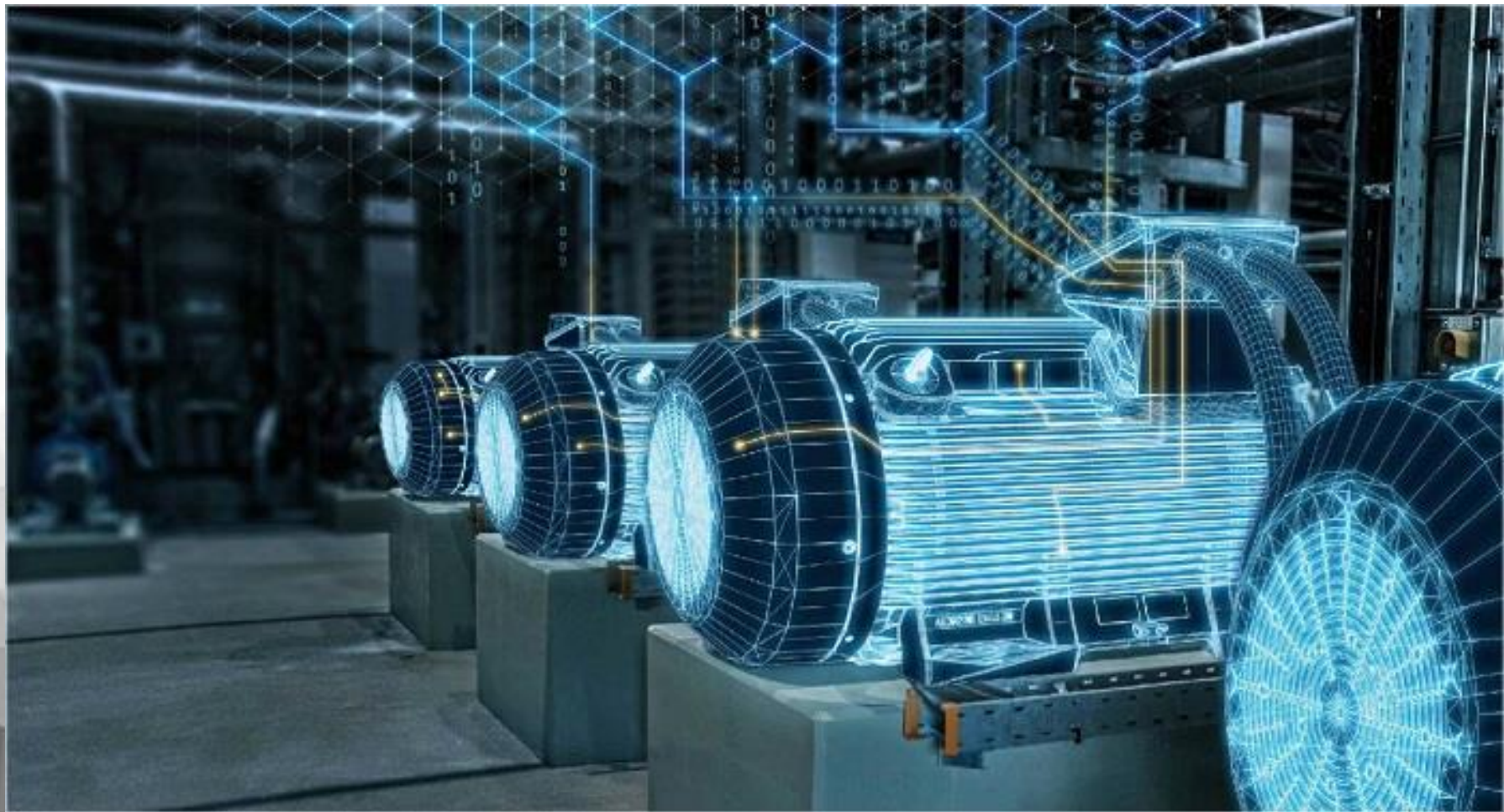
DQRA - where we aim to add value

Operators: Are you comfortable that you understand the risk sufficiently for your responsibility to safely execute the scheduled task for the day?

Activity planners: Are you comfortable that you understand the risk impact of the activity plans you are considering for your asset?

Managers: Are you comfortable that you can assure and document safe and cost-efficient decision making processes for your asset portfolio?

Digital is now..



Context of DQRA

Situation: Vast number of data available through the digital platform

Complication: No current risk models are able to instantly present the effect of changes in available data in terms of risk

Solution: DQRA represents a new methodology presenting live risk based on real time status of big data available for the digital twin

Benefits

Utilise the opportunities from digital transformation

Avoid situations that can potentially stop production

Improve your processes with regard to risk management

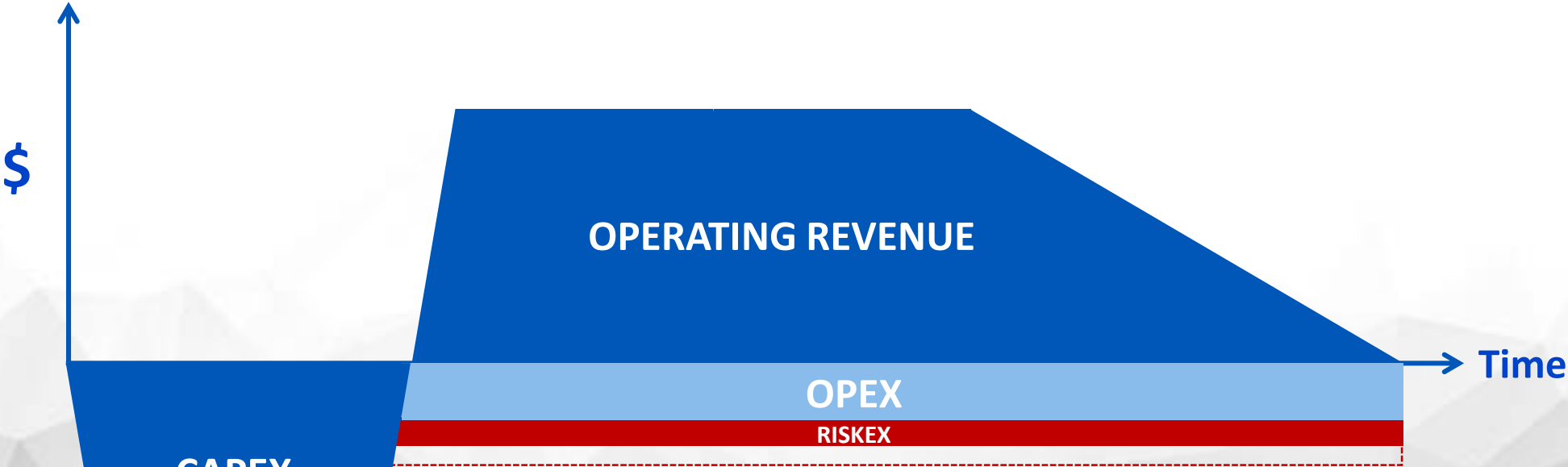
Optimise and prioritize activities

Don't pay for unnecessary OPEX



Reducing your OPEX will increase shareholder value

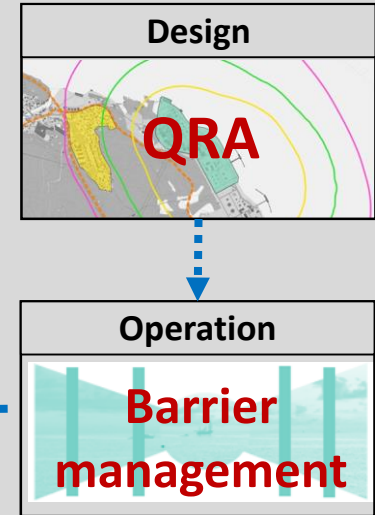
Don't pay for unnecessary RISKEX



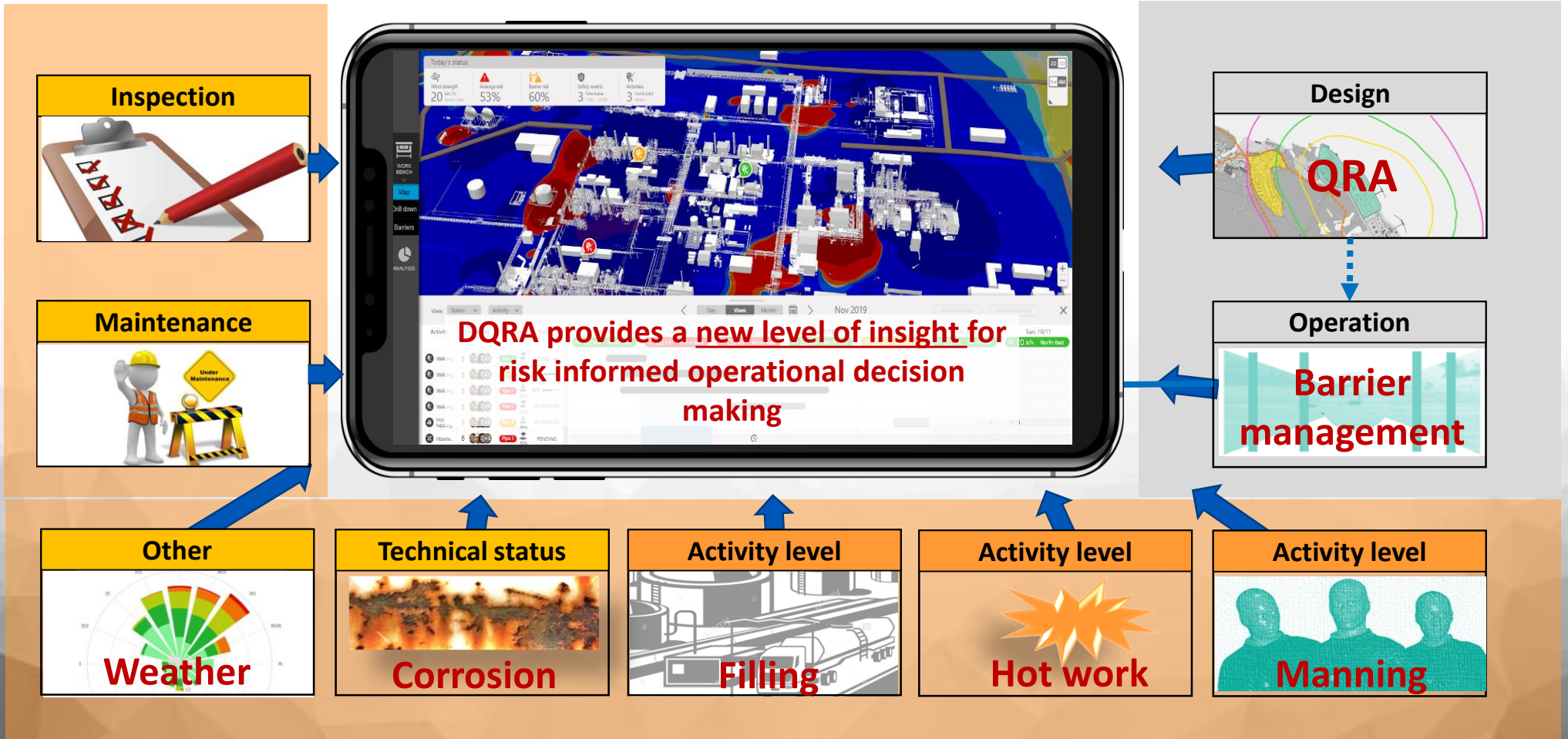
Reducing your RISKEX will increase shareholder value

DQRA outlined

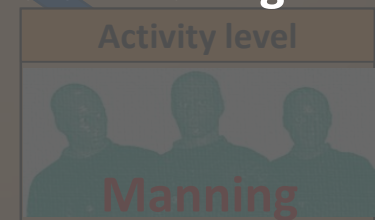
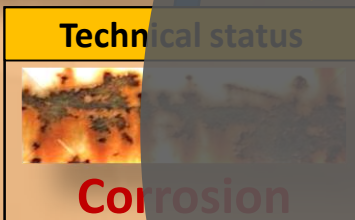
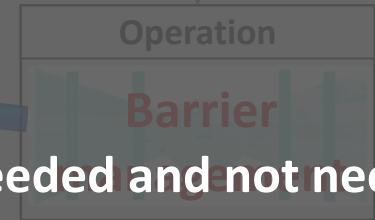
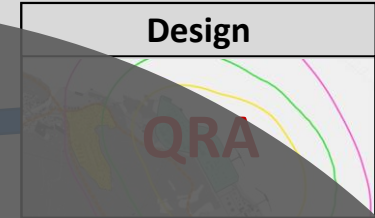
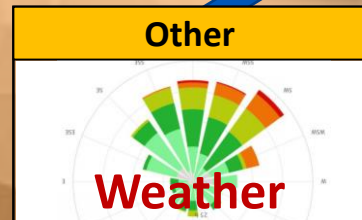
Current practice:
Operational decisions practically decoupled from their impact on risk



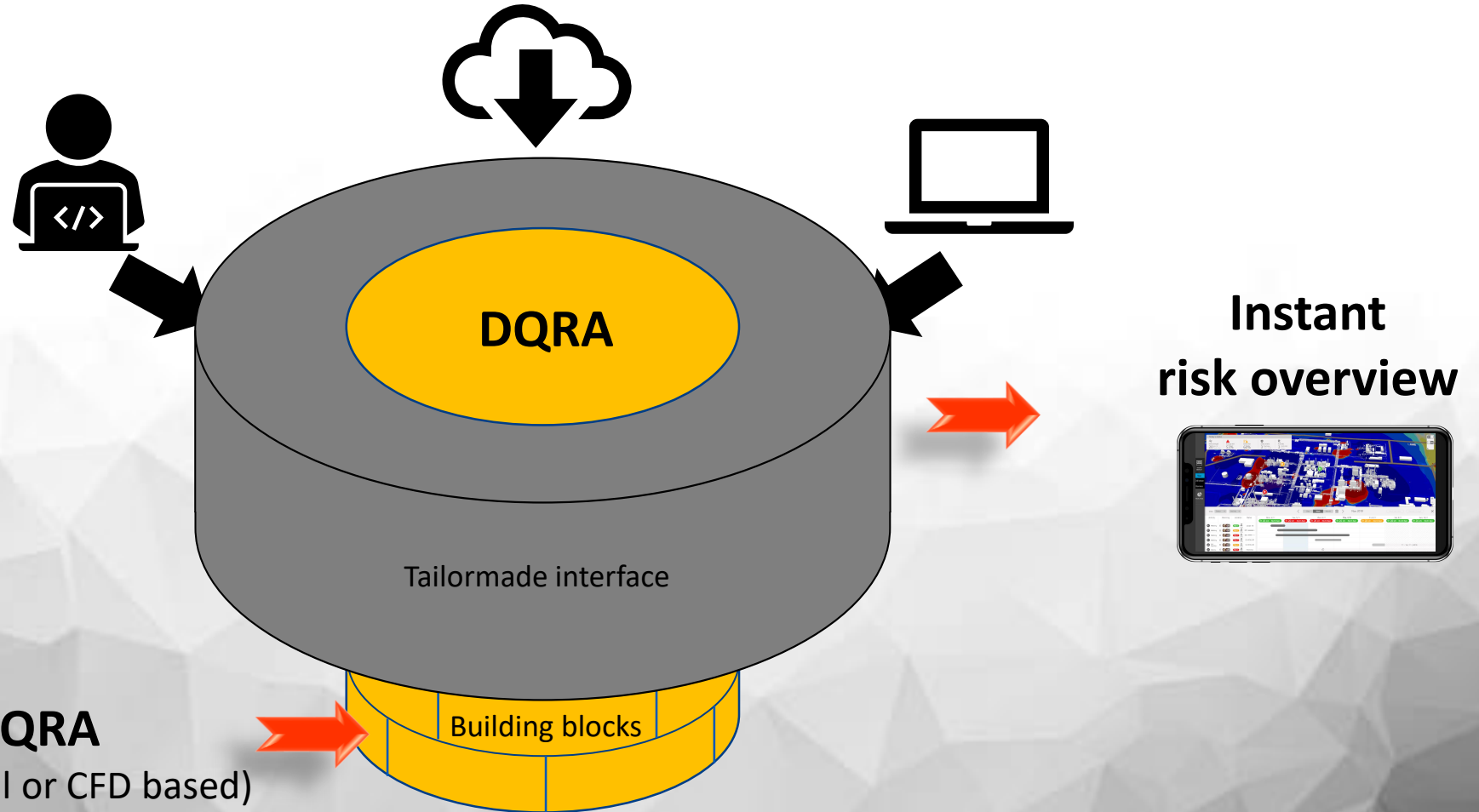
DQRA outlined



DQRA outlined

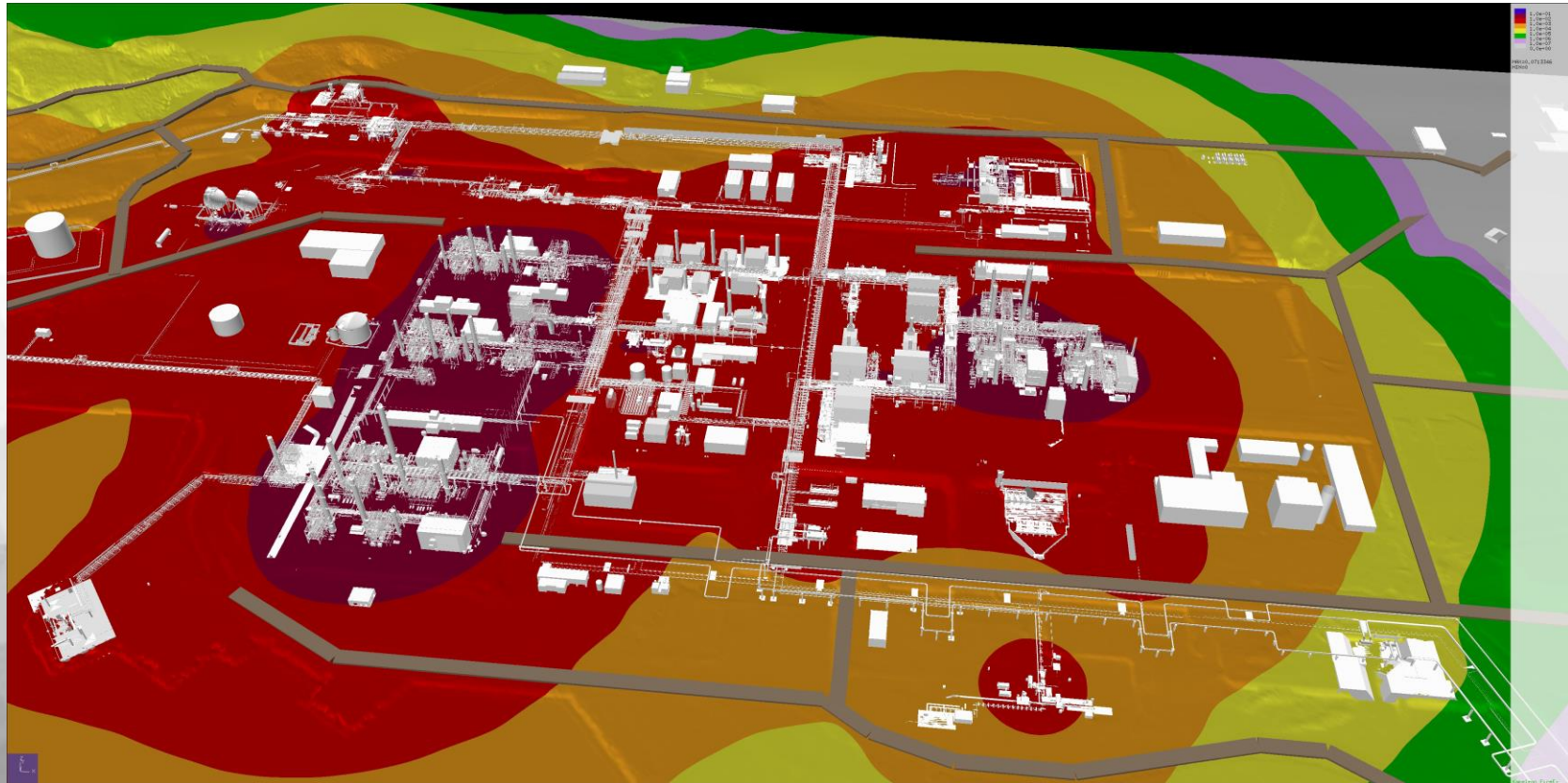


DQRA layout



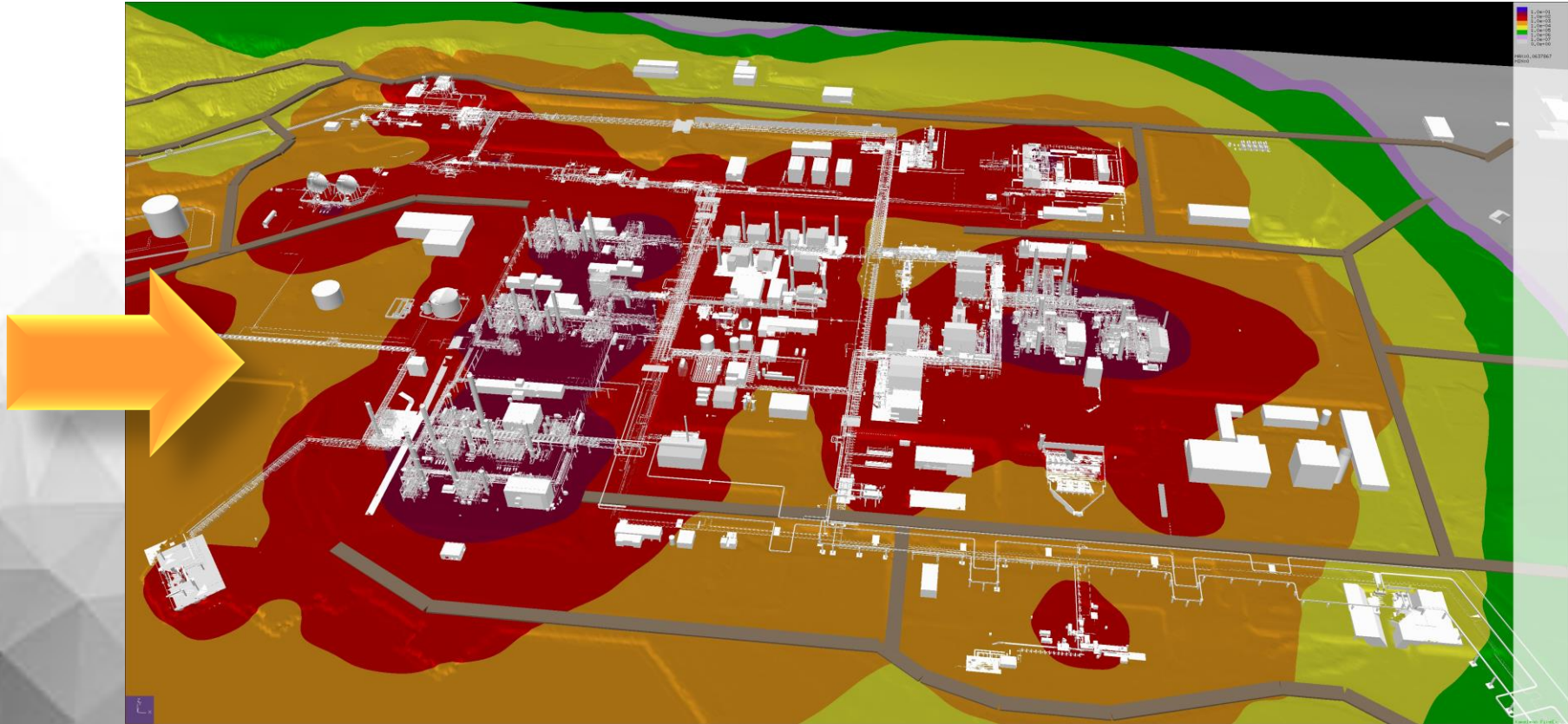
Example: Year average risk

Risk from standard QRA



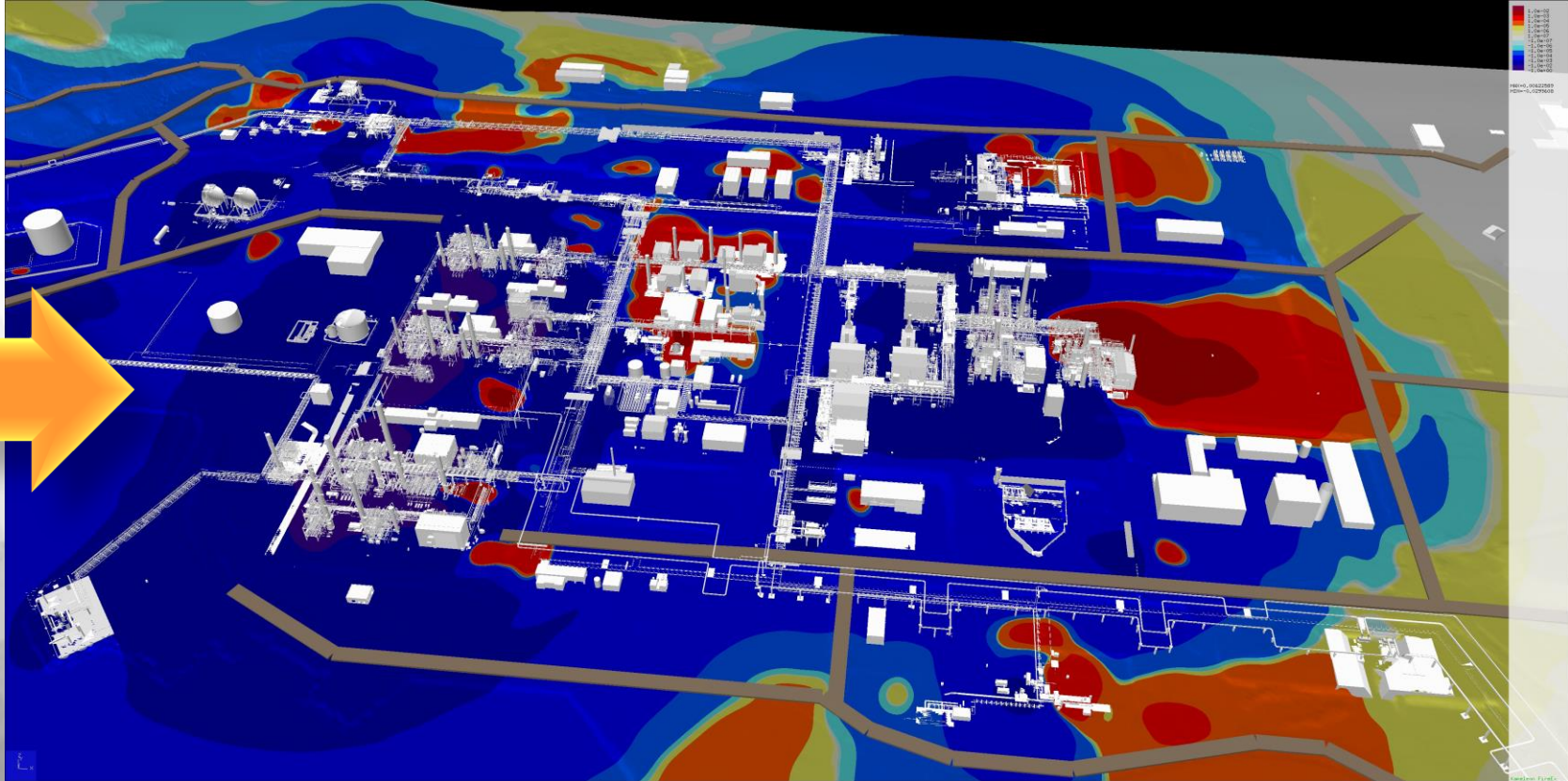
Example: Risk with strong wind from west (262.5°)

Average risk goes down due to strong wind



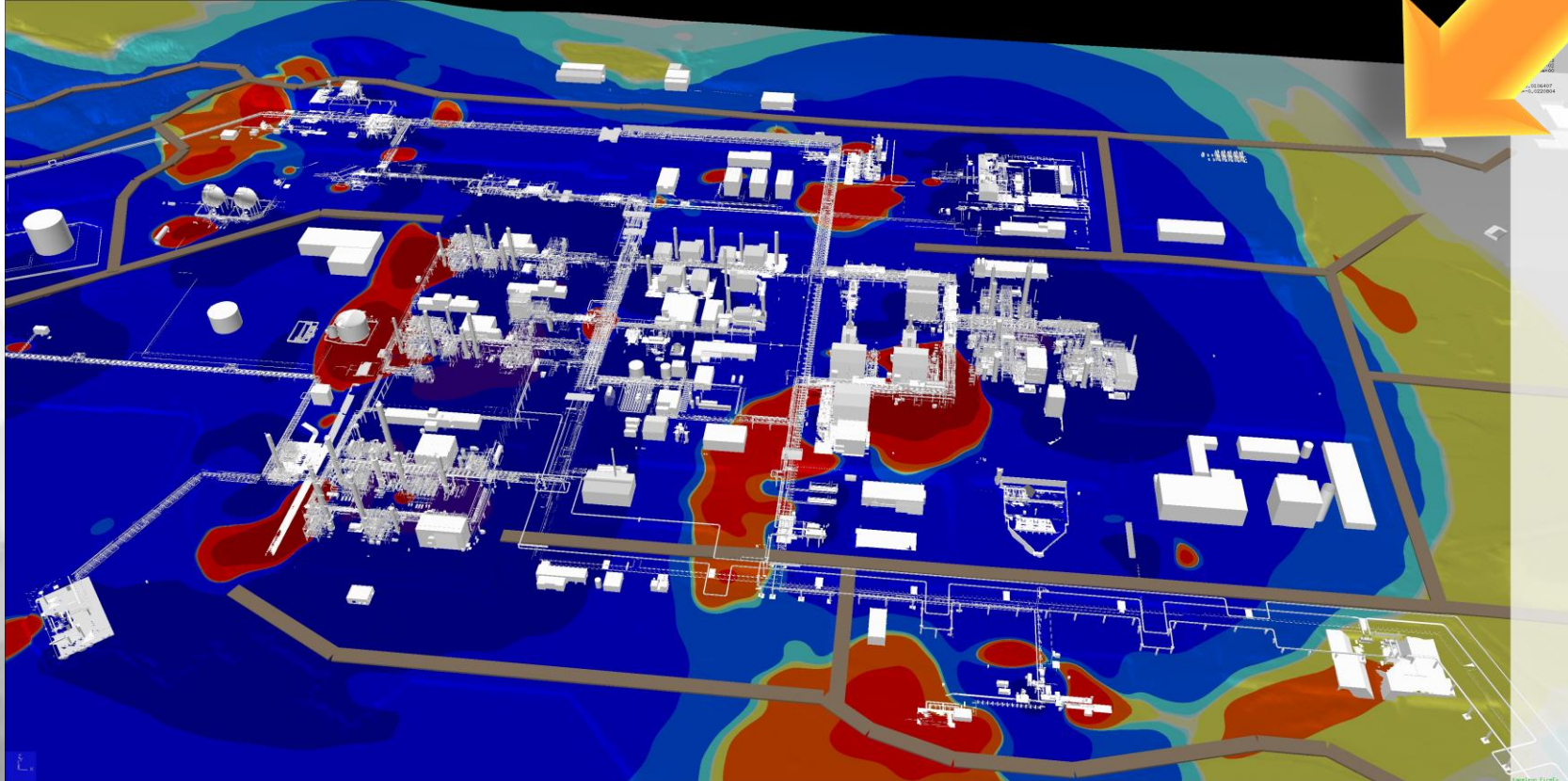
Example : Risk difference with strong wind from west (262.5°)

While average risk has goes down, it increases downwind of leak sources



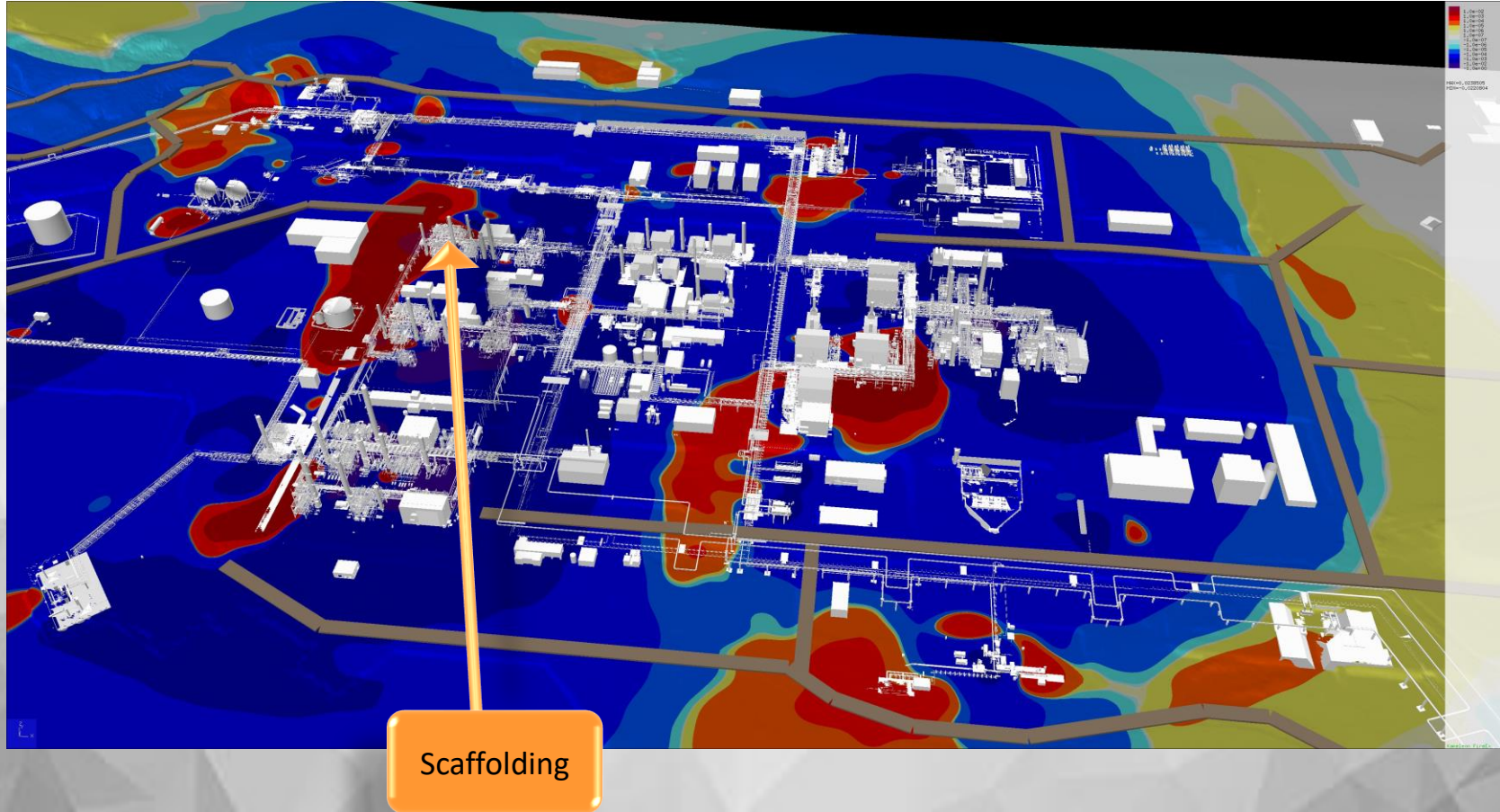
Example : Risk difference with strong wind from NE (52.5°)

Risk increase in different downwind areas



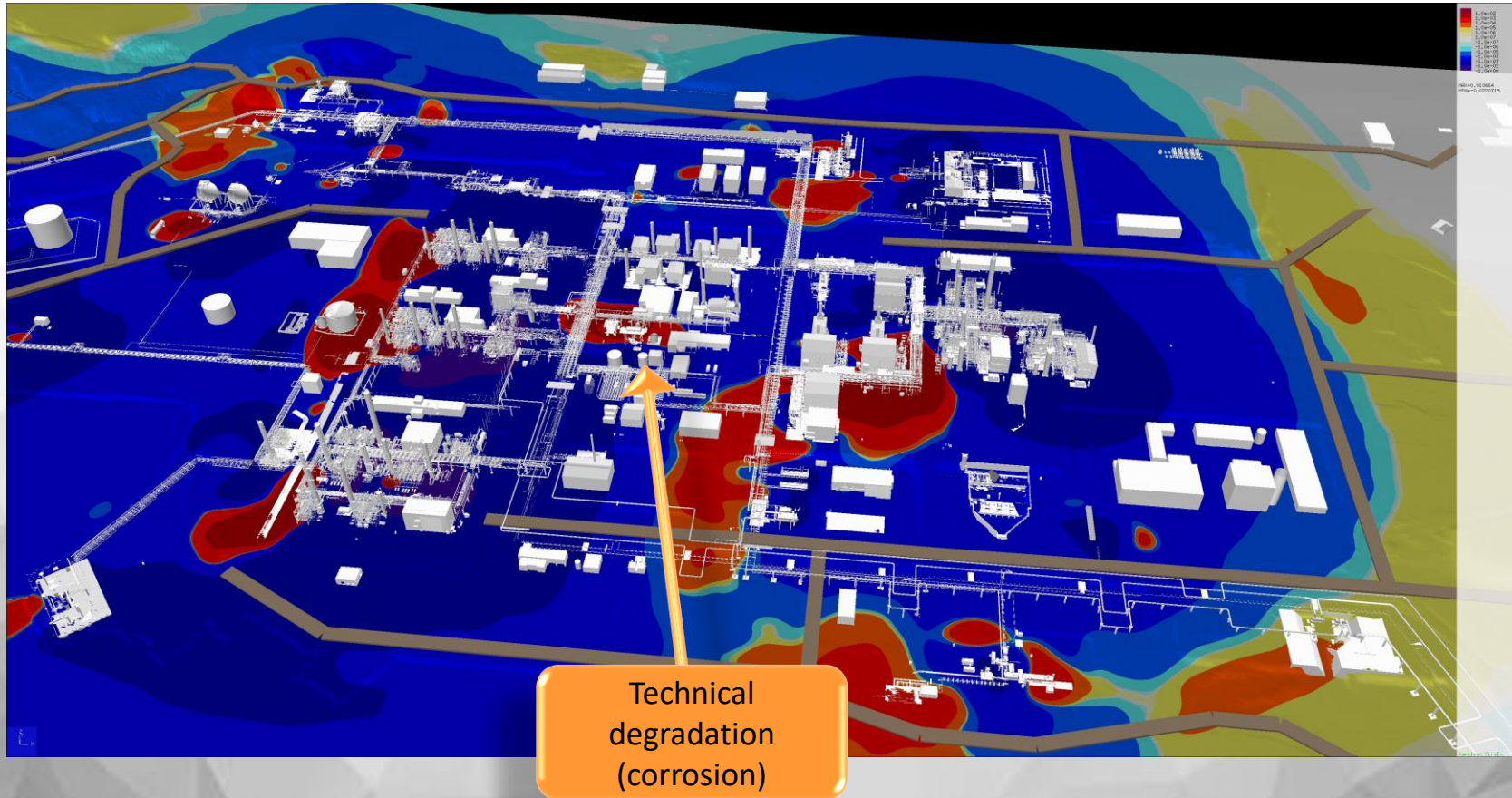
Example : Add work order in area

Risk increases around the area with work order



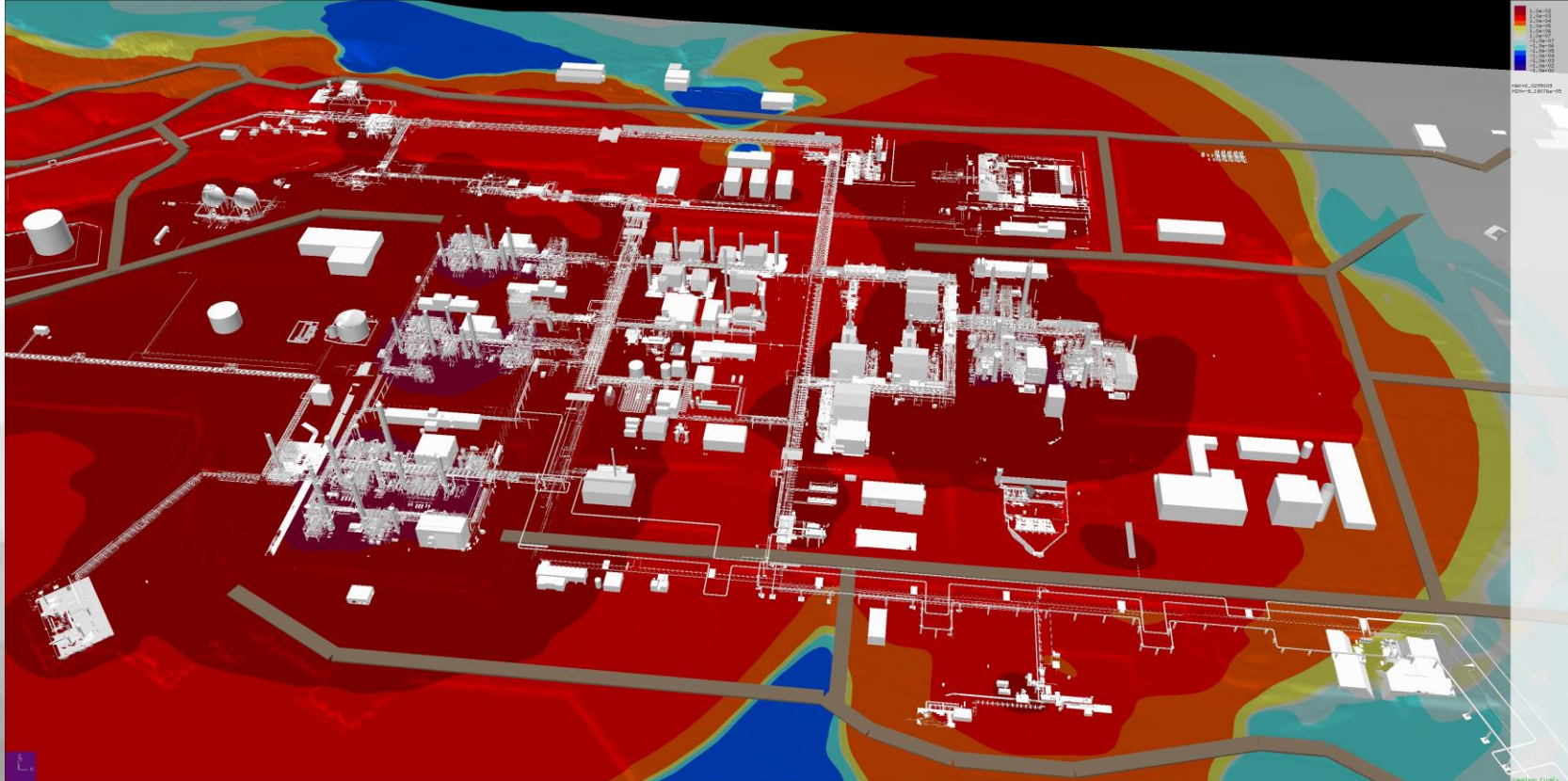
Example : Technical condition in another area

Areas with increased risk instantly detected



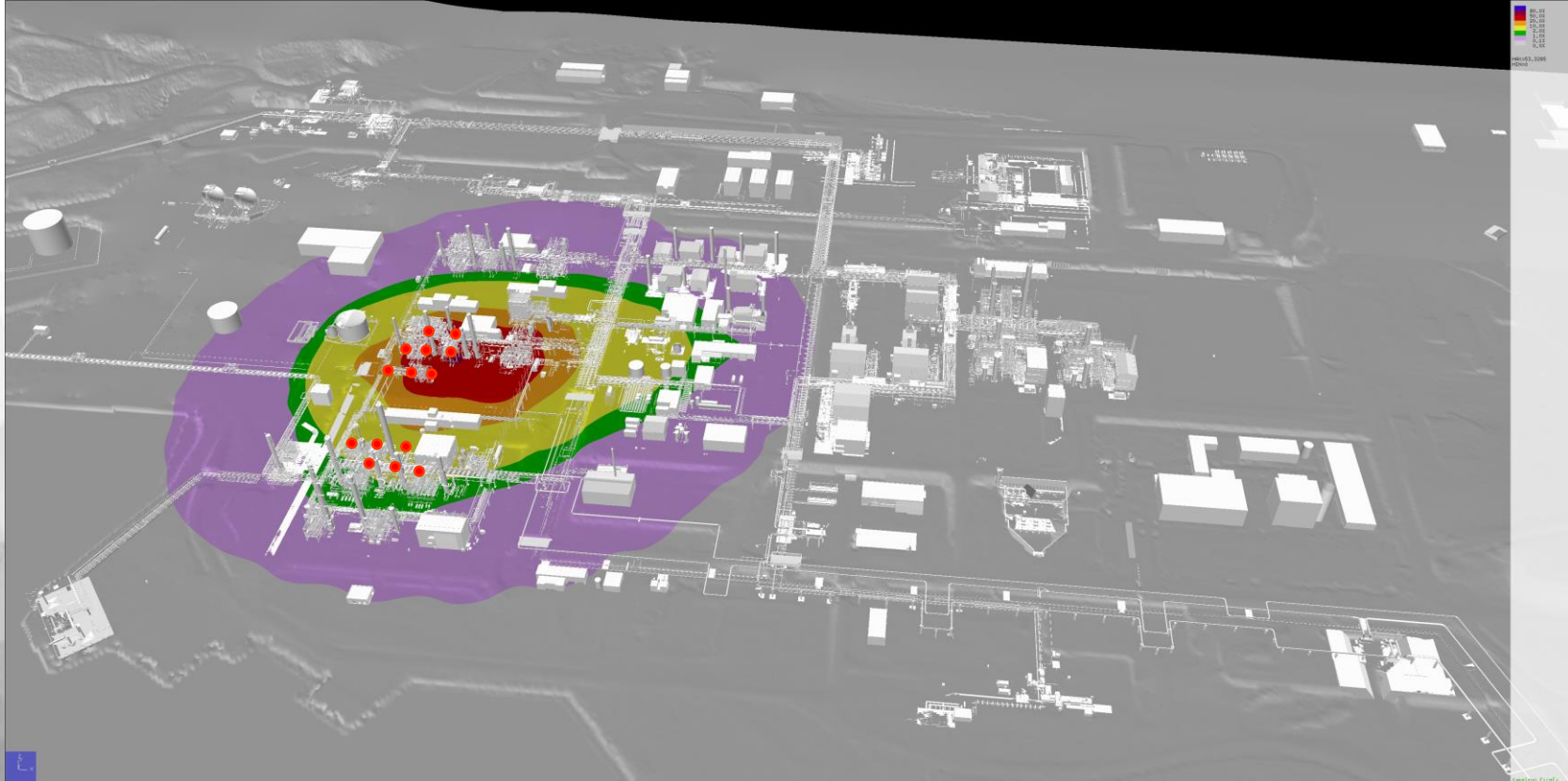
Example : Risk difference with low wind

Low wind increases risk in all areas

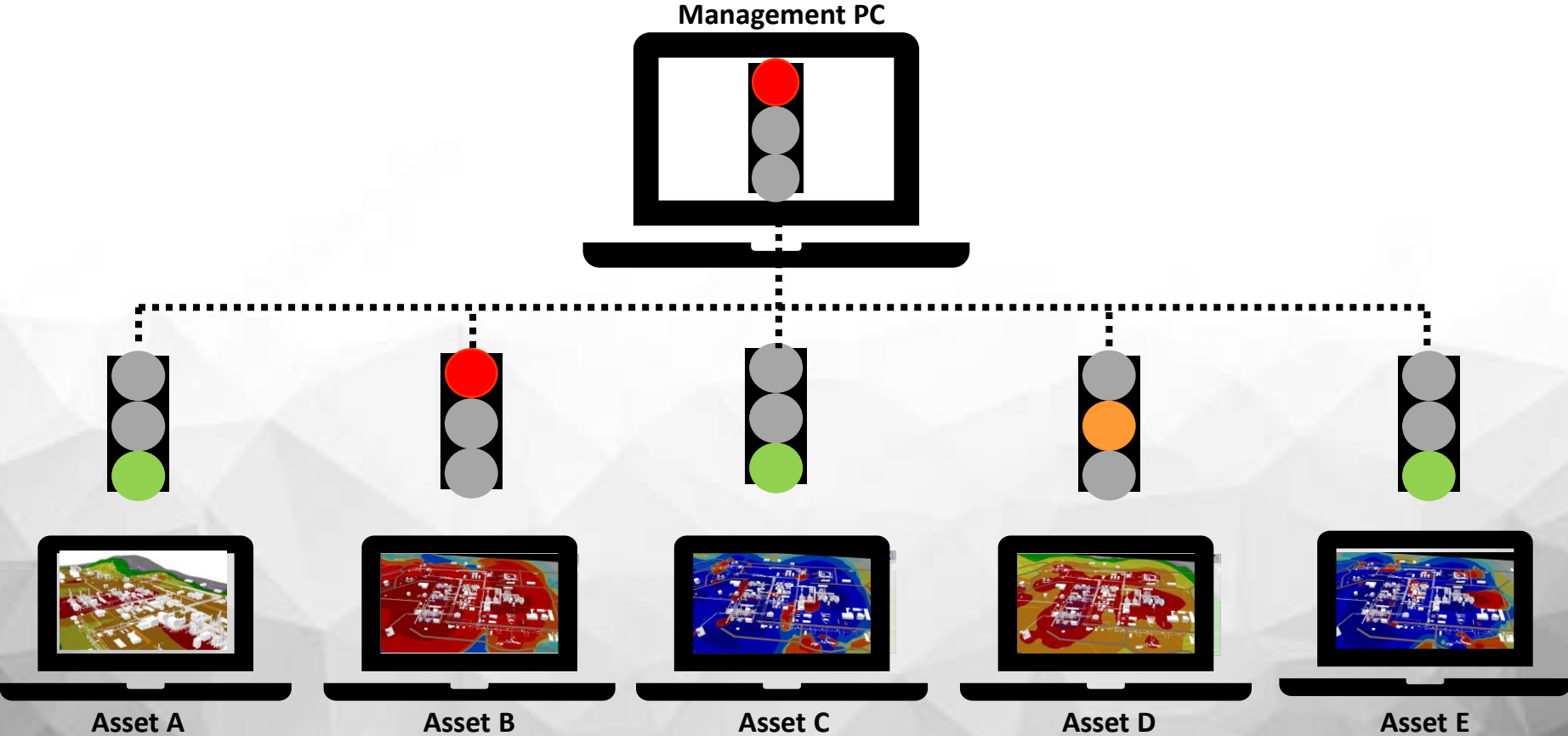


Example : Gas detection mode

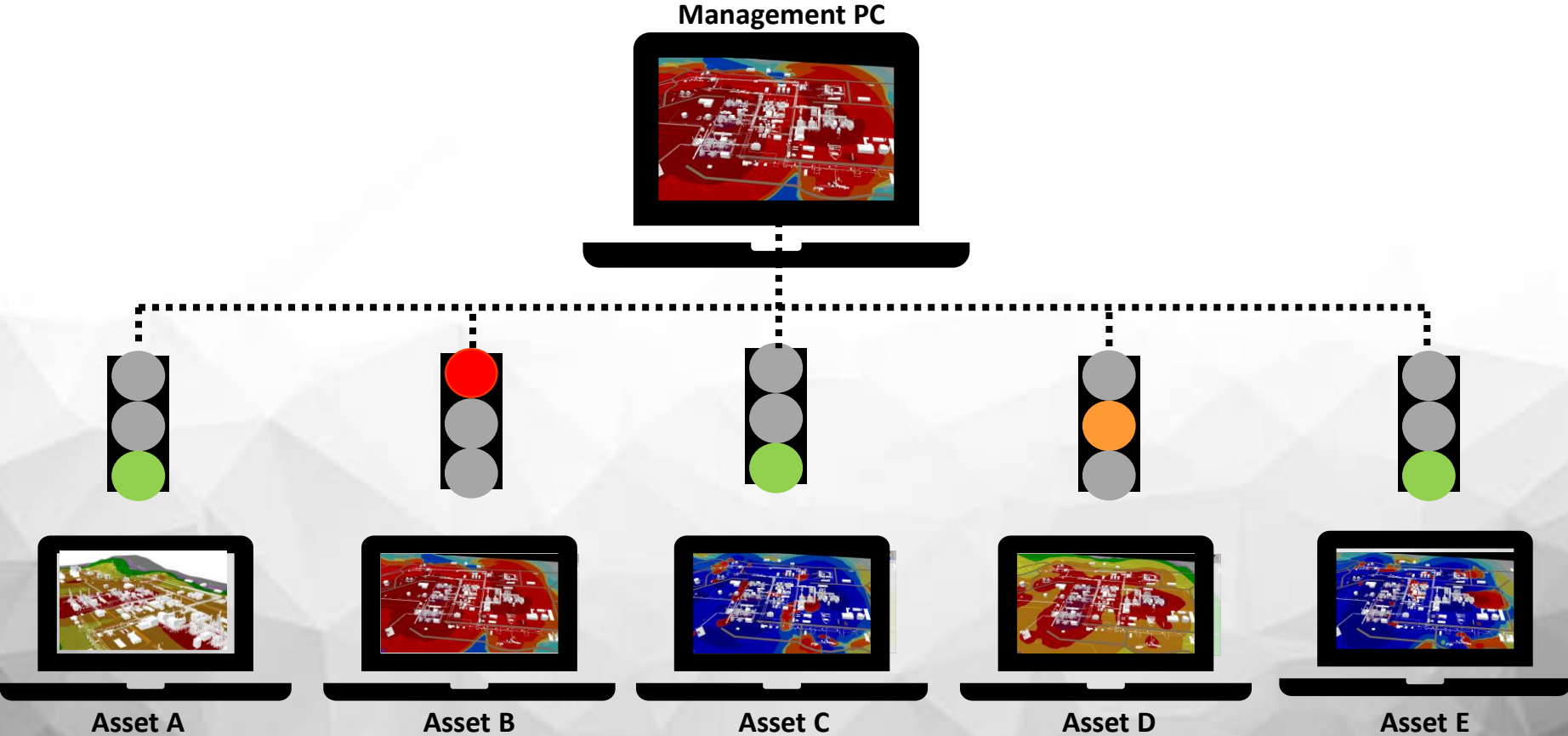
DQRA sees alarms and wind configuration



Senior management risk status aggregation



Senior management risk status aggregation





Today's status

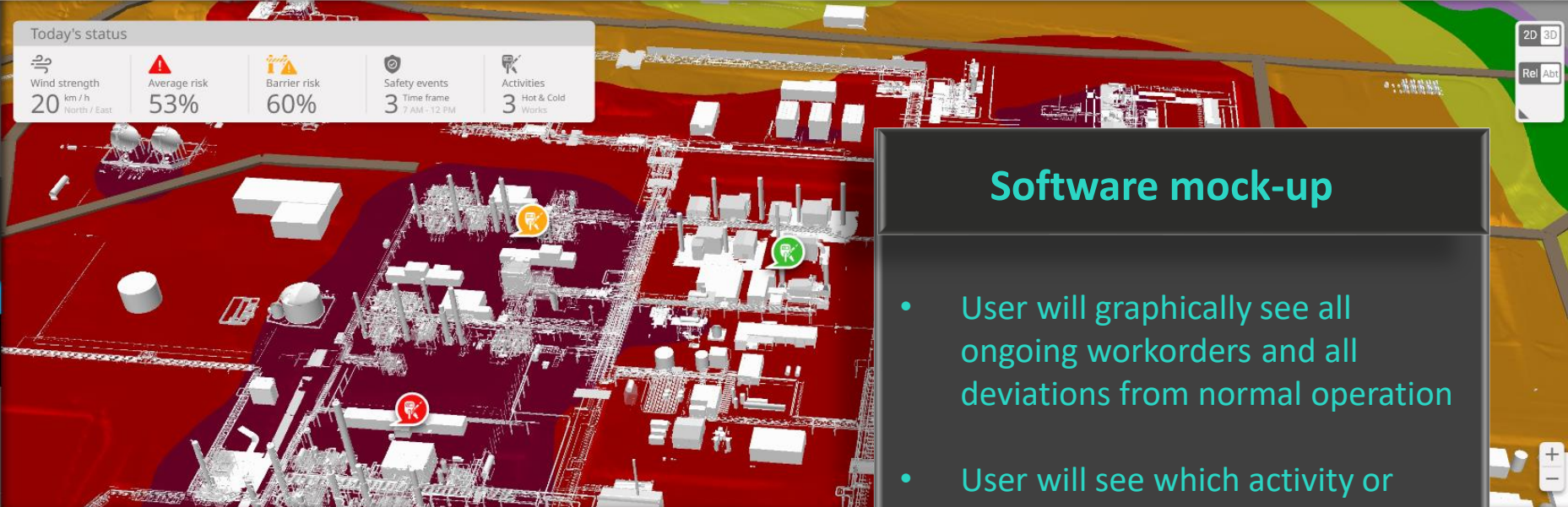
<p>Wind strength 20 km/h North / East</p>	<p>Average risk 53%</p>	<p>Barrier risk 60%</p>	<p>Safety events 3 Time frame 7-AM - 12-PM</p>	<p>Activities 3 Hot & Cold Works</p>
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Map

Drill down

Barriers



View: Status Activity

Day Week Month

Activity	Manning	Location	Status	Mon, 4/11	Tue, 5/11	Wed, 6/11
Welding	6	Pipe 3	DONE	20 k/h North-East	20 k/h North-East	20 k/h North-East
Welding	6	Pipe 3	80%			
Welding	6	Pipe 3	40%			
Welding	6	Pipe 3	SCHEDULED			
Hot tapping	6	Pipe 3	SCHEDULED			
Mainte...	6	Pipe 3	PENDING			
Welding	6	Pipe 3	SCHEDULED			

Software mock-up

- User will graphically see all ongoing workorders and all deviations from normal operation
- User will see which activity or condition that is driving the risk anomaly
- User will see risk prediction for coming days or risk history for passed days



Today's status

Wind strength
20 km / h
North / East

Average risk
53%

Barrier risk
60%

Safety events
3
Time frame
7 AM - 12 PM

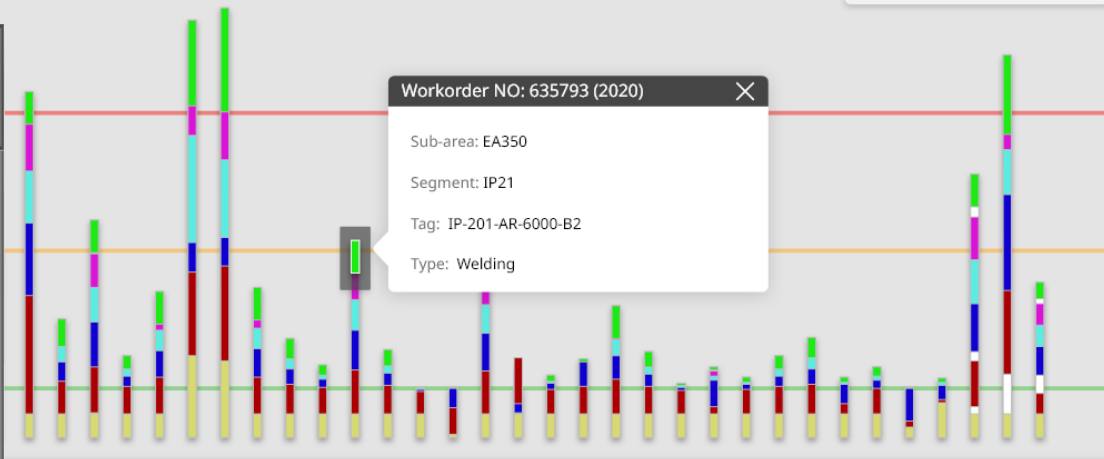
Activities
3
Hot & Cold
Works

Job type

- Job type
- Job type
- Job type
- Job type
- Job type

Software mock-up

- User can identify which anomaly is contributing to unacceptable Risk
- Graphics can be integrated with e.g. barrier management software



Nov 2019

Activity	Manning	Location	Status	Mon, 4/11	Tue, 5/11	Wed, 6/11	Thu, 7/11	Fri, 8/11	Sat, 9/11	Sun, 10/11
Welding	6	Pipe 3	DONE	20 k/h North-East	20 k/h North-East	20 k/h North-East	20 k/h North-East	20 k/h North-East	20 k/h North-East	20 k/h North-East
Welding	6	Pipe 3	80%							
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Welding	6	Pipe 3	SCHEDULED							

Summary - what can we achieve?

- **Operators** – deeper insight in safe execution of the work tasks of the day
- **Planners** – better use of operational expenditures through deeper insight in how planned activities and technical conditions actually influence risk
- **Managers** – assurance of operational decisions within acceptable safety boundaries
- **Regulators** – auditable safety management of major accident hazards



Quotes from dynamic QRA client

«Top score on all counts! We are very satisfied with the final product and its documentation. The partnership with Lloyd's Register in this project has been exemplary throughout the process»



equinor

Risk reduction: better and clearer decision support, increased risk-awareness

Increased ***flexibility*** of operation
- without compromising safety

Cost reductions: less time spent on assessments and less incidents

Simplifies the daily risk evaluation of planned activities

Thank you

Please contact:

Joar Dalheim

M +47 952 41 750

joar.dalheim@vysusgroup.com