5 benefits of 5G

Levente Nemeth

HUSTEF 2022

NOKIA

Agenda

- This presentation explains 5 unusual and perhaps less known applications of 5G mobile broadband technology where greater **bandwidth** and lower **latency** matters

	4G	5G
Latency	10-100ms	< 10 ms
Download speed	1 gbps	20 gbps
Allowed maximum mobility speed	350 km/h	500 km/h

Please note, that the following use-cases are highlighted scenarios of complex solutions and does not represent the full landscape of 5G capabilities

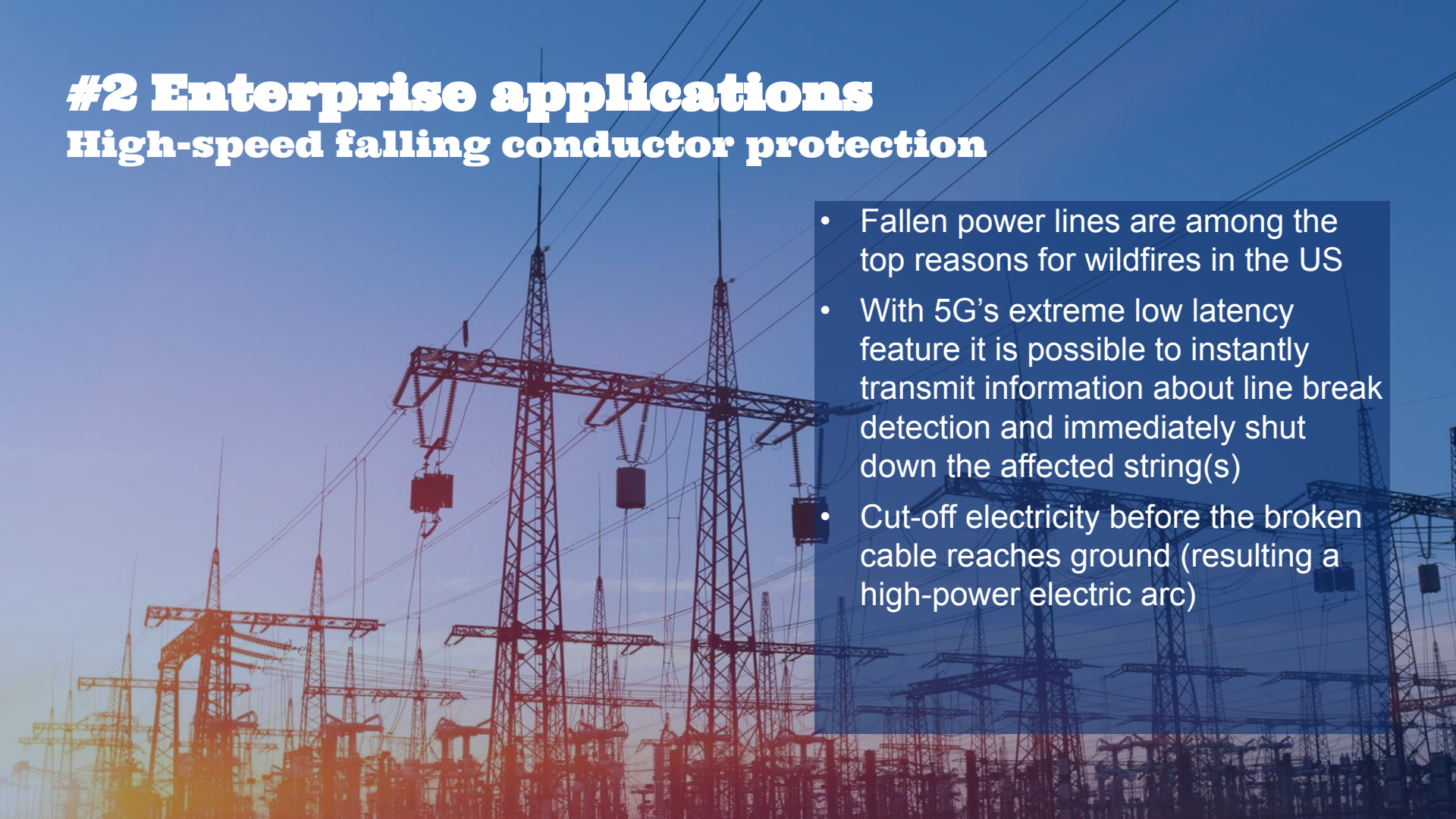
#1 Railway industry

Driverless & remotely operated trains

- **FRMCS** Future Railway Mobile Communication System (replacing GSM-R)
  - EU project to introduce 5G as the main railway communication and signaling platform
- **Automatic Train Operations (ATO) levels 0 – 5**
  - Driverless operation (level 3 & 4)
  - Unattended (level 5)
- Critical video support for driverless trains

#2 Enterprise applications

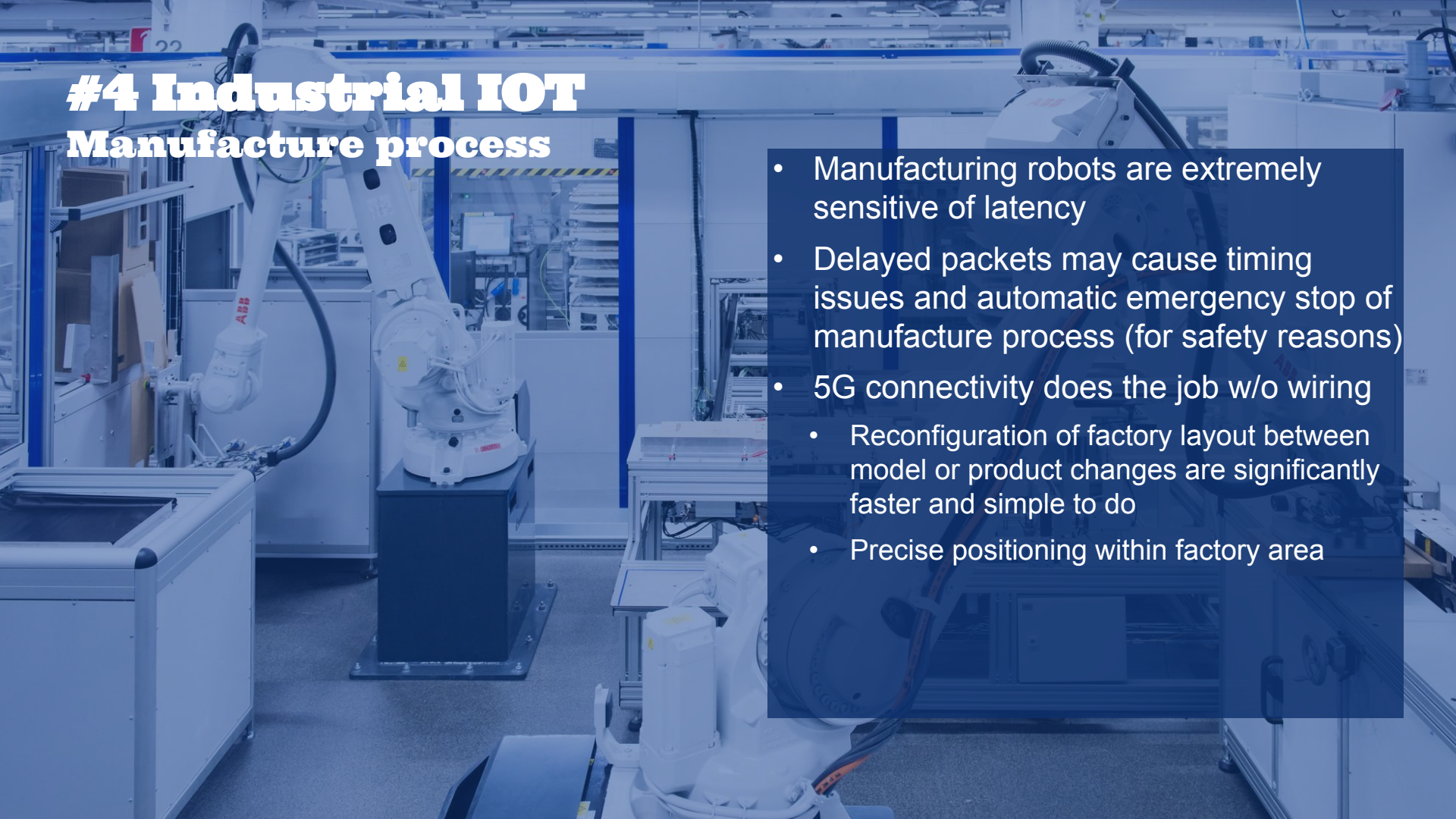
High-speed falling conductor protection



- Fallen power lines are among the top reasons for wildfires in the US
- With 5G's extreme low latency feature it is possible to instantly transmit information about line break detection and immediately shut down the affected string(s)
- Cut-off electricity before the broken cable reaches ground (resulting a high-power electric arc)

#3 Agriculture

- High quality video streaming of drones
- Detect pests and plant diseases on the fly
- Targeted spraying against diseases using on-the-fly video detection



#4 Industrial IOT

Manufacture process

- Manufacturing robots are extremely sensitive of latency
- Delayed packets may cause timing issues and automatic emergency stop of manufacture process (for safety reasons)
- 5G connectivity does the job w/o wiring
  - Reconfiguration of factory layout between model or product changes are significantly faster and simple to do
  - Precise positioning within factory area

#5 First response services

On-the-fly translation service

- AI driven natural language translation during call
- Speech processing and translation can be done on the Edge Cloud
- Can be used by first response services (eg. 911 or 112 call centers)
- 5G enables fast translation and almost unnoticeable delay in call

NOKIA