

Security

Shipping is so insecure we could have driven off in an oil rig

Not many stranger things happen at sea

By Gareth Corfield 18 Feb 2020 at 16:45

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An oil drilling rig (file photo)

Penetration testers looking at commercial shipping and oil rigs discovered a litany of security blunders and vulnerabilities – including one set that would have let them take full control of a rig at sea.

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5G & Cyber-Security

User experience and learnings
from other “silos” for
Smart Ports



Before we begin... Background – in 3 points

1. Post Samsung, led UK Government 5G R&D programme “phase 0” – looking at **urban** high frequency radio propagation tools
2. We met during a later phase of the 5G Test-bed and Trials programme, exploring how to actually deliver **rural** areas with 5G secure spectrum services on a project called “*5G RuralFirst*”
3. We now advise on commercial 5G spectrum and security deployment, bringing knowledge from other industry “silos”

Funded by



Department for
Digital, Culture,
Media & Sport



5G RuralFirst

We get (former)
Ministerial attention!



Image:
The Chancellor 10th September 2018 in Strathclyde University

And (current) international recognition



- DSA Award for Increasing Digital Inclusion – Washington DC, 26th June 2019

Dr. Greig Paul collecting Digital Inclusion Award

From 5GRF to 5GRD!

- We started at a port!
- We have their backing...
- Plus some other “names” you might recognise too!

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WTR/LBG PPL 710/8



8 October 2019

Dear [REDACTED]

I write in support of Dorset Council's bid for funding to introduce 5G mobile connectivity to parts of rural Dorset.

In addition to the obvious benefits for the rural population of Dorset, the business community would also benefit. Portland Port is one of those businesses.

The port was a naval base until 1996 when it was sold by the MOD to Langham Industries. However, it remains the de facto home of the Royal Fleet Auxiliary. It has been developed as a commercial port and over the last 23 years has grown into a successful operation with a diverse range of income streams. It also remains the only port in an emergency [REDACTED]

As the port continues to develop and grow it will face many challenges, not least of which will be the need to embrace technology to help improve the safety and efficiency of its operations. The benefits that 5G will bring in terms of communication and connectivity between devices will help it to meet those challenges.

There are many other businesses in Dorset that will also benefit from the introduction of a 5G network and I hope that you are successful in persuading central government to agree to your funding request.

Yours sincerely,



Chief Executive



5G RuralDorset

DCMS 5GTT Winner - Announced Today!

Why 5G? Why Security?

The “why/why not” for 5G is **irrelevant** – We’re getting it anyway!

This makes the case for 5G security by default **overwhelming**

We will:

- 1. Consider the UK’s need for effectively connected ports**
- 2. Share some recent user experiences and learnings in today’s world – as we prepare for tomorrow’s**
- 3. Look at the policy backdrop and CNI – including freeports**
- 4. Consider – what next?**

The UK depends on Imports
Including food...

This Matters

1. The need for effectively connected ports

2018 UK Freight Export (k ton)

- Forth (Scotland) = 21,996 k ton
- Tees & Hartlepool = 16,802 k ton
- Grimsby & Immingham = 13,951 k ton
- Southampton = 12,332 k ton
- Milford Haven (Wales) = 11,708 k ton
- Felixstowe = 11,527 k ton
- Dover = 10,058 k ton

2018 UK Freight Import (k ton)

- London = 44,771 k ton
- Grimsby & Immingham = 41,666 k ton
- Liverpool = 24,123 k ton
- Southampton = 22,137 k ton
- Milford Haven (Wales) = 19,228 k ton
- Felixstowe = 16,740 k ton
- Dover = 14,885 k ton



¡VOTAD SIEMPRE en
las urnas!
¡No votéis
nunca!
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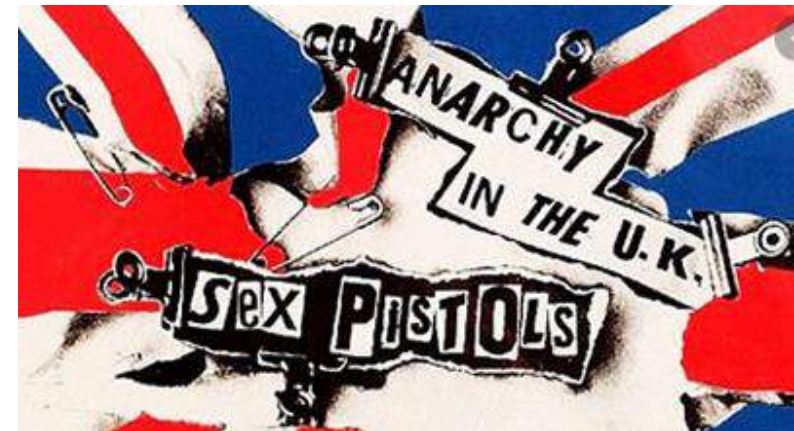


UK PSTN switch off date already set

5G is coming to Ports – Did you know?

1. 5G is the Martini service “anytime, any place, anywhere”
2. Integrated fixed and mobile – super bandwidths
3. More “software dependent” then ever – new security risks!
4.So guess what’s going to happen next?

Are you ready for this yet? If not start now



2. Some recent experiences and learnings in today's world



User Experience and Learnings

An Example

No mobile service & no power

“Not expected!”

Technology

O2's All-Day Outage Caused Havoc in Ways Consumers Didn't Expect

By Nate Lanxon

8 December 2018, 10:12 GMT Updated on 10 December 2018, 09:31 GMT

- ▶ London's bus riders left in the dark about schedule delays
- ▶ Software-failure impact spread far beyond cell phone users



Photograph by Kristian Dowling/Woodberg

LISTEN TO ARTICLE

▶ 2:45

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When the U.K.'s second-biggest cell-phone network went down Thursday, it struck transit riders, workers in the gig economy, small businesses and the self-employed.

Among the victims of Telefonica SA-owned O2's widespread data outage were commuters hoping to use their smartphones to find when the next bus was due. The systems on board all 8,500 London buses, which send live location data back to the city's transit authority and third-party mapping services, were knocked offline.

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Listen to Live Radio >



News

Major power cut across country as London goes dark after National Grid failure



Save



London experienced rush-hour chaos today when the power died across the country

Power cut and downpours bring 'apocalypse' to streets

For many, the two hours of mayhem caused by Friday evening's power cuts created scenes reminiscent of a darkly apocalyptic Hollywood film.

Trains rolled to a halt and traffic lights flickered before going blank, leaving drivers second guessing one another on major junctions.

Mobile phone and internet reception went dead as communications masts apparently lost power.

User Experience and Learnings

An Example

No mobile service & no power

1. Reliance on non Critical National Infrastructure v cost?
2. Is this collateral damage an insurable risk?
3. Productivity loss – trucks (ships) can't unload themselves

User Experience and Learnings

An Example

Travelex

“Not expected!”

24 Jan!!!!

Currency Exchange

Travelex

worldwide
money

ATM



urrency Express

ORDER ONLINE

STORE

User Experience and Learnings

An Example

Travelex

1. What is your disaster recovery plan? “red teamed?” yearly?
2. What inter-industry/gov. cyber collaboration in place?
3. Do you understand your full supply chain?

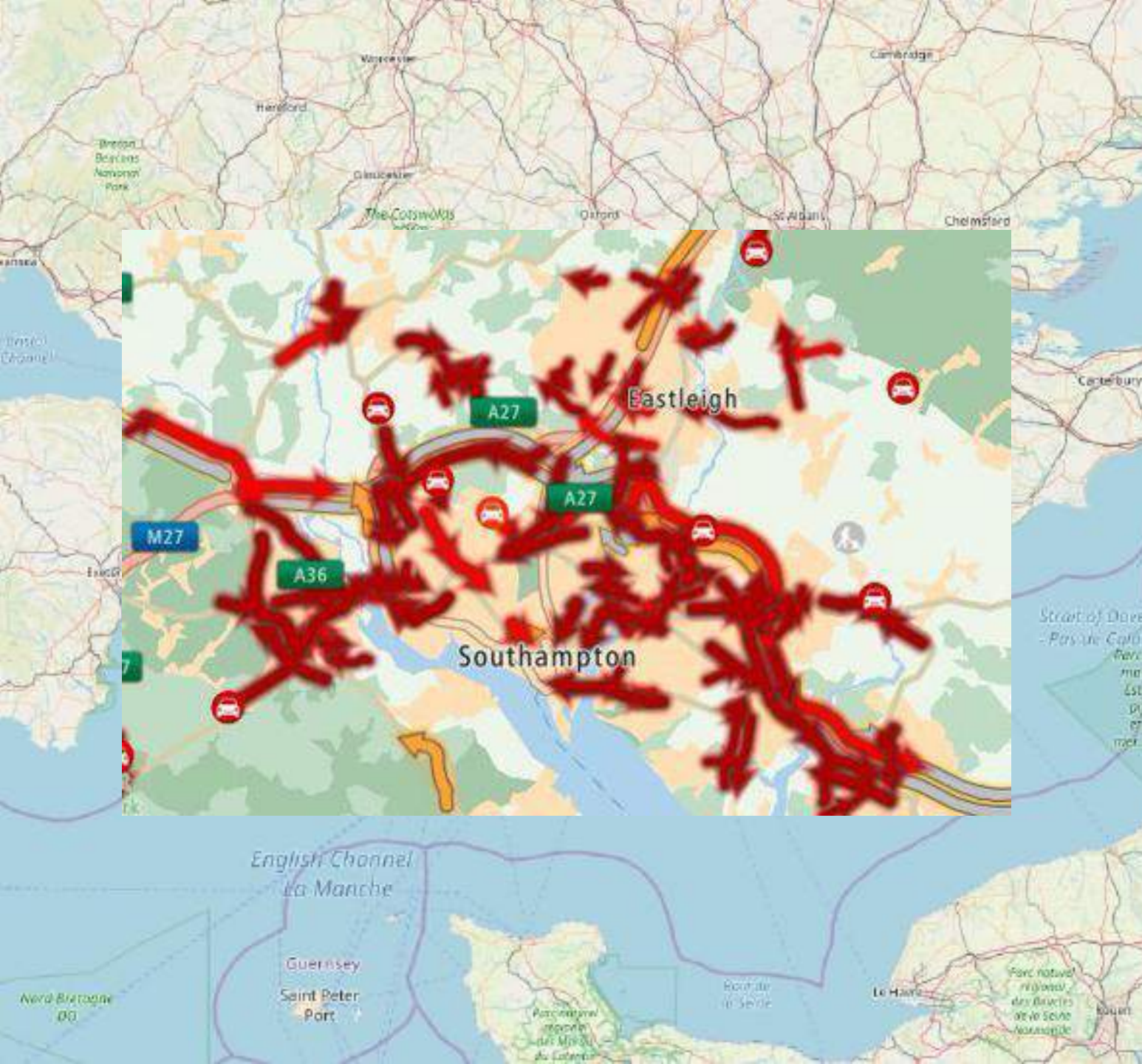
User Experience and Learnings

An Example

Road Infrastructure

“Not expected!”





User Experience and Learnings

An Example

Road Infrastructure

1. What impact if the “smart city” en-route to port got hacked?
2. Are you engaged with planning beyond the perimeter fence?
3. Can you do just-in-time delay or re-routing cargo in transit?

User Experience and Learnings

An Example

Shipping Industry

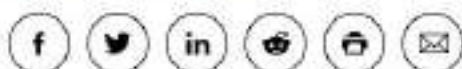
“Complete equipment loss”

January 26, 2018

NotPetya attack totally destroyed Maersk's computer network: Chairman

Doug Olenick

[Follow @DougOlenick](#)



Shipping giant and NotPetya victim Maersk was forced to replace tens of thousands of servers and computers in the aftermath of the June 17 ransomware

attack, the company's chairman said in Davos at the World Economic Forum.

Maersk Chairman Jim Hagemann Snabe said while participating on a [cybersecurity panel](#) at the conference that his company replaced 45,000 PCs, 4,000 servers and install 2,500 applications. The computer system runs an operation where a ship carrying 20,000 containers enters a port every 15 minutes somewhere around the world. Overall, Maersk handles 20 percent of all world trade, he said.

"We found we had to reinstall our entire infrastructure. It was done in a heroic effort in just 10 days," he said, adding such a job should take about six months to complete.

Shipping Company Struck by Ransomware Attack



DAVID BISSON

JUL 27, 2018

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[LATEST SECURITY NEWS](#)



A shipping company suffered a ransomware attack that affected certain network systems in one of its regions of operation.

On 25 July, COSCO Shipping Lines disclosed on [Facebook](#) that it had suffered a "local network breakdown" in the Americas. The company, which is owned and operated by the Chinese government, said that the incident degraded local email and network telephone services but not its main business operations, including the functionality of all its vessels. COSCO decided to suspend certain connections with other regions out of an abundance of caution.

The shipping giant had not directly revealed the source of the event at the time of publication. But it did retweet a tweet from The Modern Times of LB (Long Beach) attributing the network issues to a ransomware attack.

User Experience and Learnings

An Example

Shipping industry

1. Maersk did brilliantly! 45,000 PCs... 10 days... could you?
2. Do you do threat horizon scanning & report this to Board?
3. What is an “adequately” resourced cyber team?

5G – what it means for transport

1. The Internet of Things means everything is connected to everything
2. Whether on land, sea or air, everything is changing
3. 5G simply multiplies an effect that is already happening throughout all of your operations already – massively

Everything is not just “connected” but “interdependent” - nearly

Coronavirus: Jaguar Land Rover 'shipping parts in suitcases'

🕒 9 hours ago

[f](#) [💬](#) [🐦](#) [✉](#) [Share](#)

Coronavirus outbreak



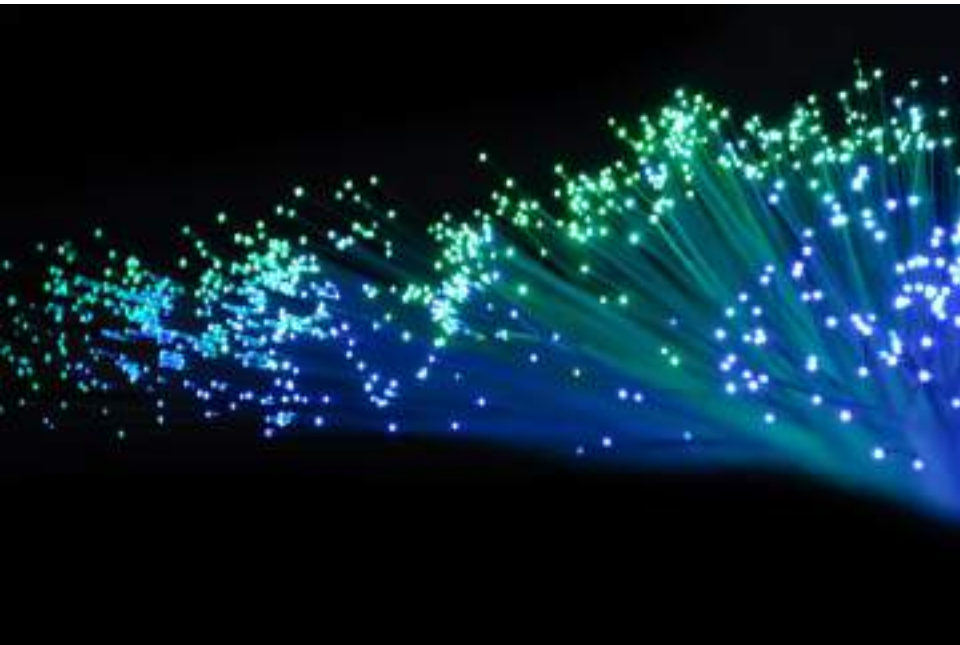
Jaguar Land Rover has flown in parts in suitcases as the effects of coronavirus take a toll on the carmaker's supply chain.

It said it could start to run out of Chinese parts for its UK factories after two weeks.

The virus has killed more than 1,800 people in China sparking a shutdown that has seen factories close across the country.

That is having an impact on global supply chains.

3. Shipping + Ports = CNI? The Policy Dimension





Foreign Secretary, Dominic Raab

The critical security question is: how to mitigate such vulnerabilities and stop them damaging the British people and our economy?

For 5G and full fibre networks, the Review concluded that, based on the current position of the UK market, high risk vendors should be:

- first of all, excluded from all safety related and safety critical networks in Critical National Infrastructure
- secondly, excluded from security critical network functions
- and thirdly, limited to a minority presence in other network functions up to a cap of 35%.

And be subjected to tight restrictions, including exclusions from sensitive geographic locations.

DCMS 5GTT – and the Supply Chain

5G Impact – DCMS 5G Test-bed programmes
incl. future ones (in italics)

1. From factory or farm
2. To land transport
3. To port A
4. To Loading
5. To Voyage
6. To port B
7. To land transport
8. To destination

Industry 4.0 & 5GRural First

Autoair (road)

5G RuralDorset (“5GRD”)

Not yet addressed/5GRD2

5GRD (satellite)...part

Wales?/**You? Ask us!**

Rail (Transpennine, Oxf-Cam)

Various

of 6 July 2016

concerning measures for a high common level of security of network and information systems across the Union

(7) To cover all relevant incidents and risks, this Directive should apply to both operators of essential services and digital service providers. However, the obligations on operators of essential services and digital service providers should not apply to undertakings providing public communication networks or publicly available electronic communication services within the meaning of Directive 2002/21/EC of the European Parliament and of the Council ⁽³⁾, which are subject to the specific security and integrity requirements laid down in that Directive, nor should they apply to trust service providers within the meaning of Regulation (EU) No 910/2014 of the European Parliament and of the Council ⁽⁴⁾, which are subject to the security requirements laid down in that Regulation.

Public Mobile (& Telecoms) networks are not covered by the NIS Directive!

BUT Shipping is CNI in UK

2002 Framework Directive outdated

- has considerably lower penalties
- was written in 2002, as name suggests
- Does not feature the word “cyber”

UK NIS Implementation definitions of CNI

Water Transport Operator	Threshold
Shipping company	> 5 million tonnes annual freight
(or)	>30% freight any one major port*
	>30% annual pax numbers at a port, which has > 10m pax
Harbour Authority	>10m pax annually
(or)	Is a major port*
Port Facility Operator	>10m pax annually
(or)	Is a major port*
Vessel Traffic Services Operator	>10m pax annually
	Operates at a major port*

Definition	Threshold
*Major Port	>15% total RORO traffic in UK
(or)	>15% total LILO traffic in UK
	>10% total liquid bulk in UK
	>20% total biomass fuel traffic

Freeports consultation

Published 10 February 2020

Last updated 10 February 2020 — [see all updates](#)

From: [Department for International Trade](#)

Summary

A consultation to inform the government's freeports policy.

This consultation closes at
11:59pm on 20 April 2020

Consultation description

The government is working to boost economic activity across the UK, ensuring that towns, cities and regions across the country can begin to benefit from the opportunities of leaving the EU. As part of this work, the government aims to create up to 10 freeports in locations across the UK.

The government wants to establish freeports, which have different customs rules than the rest of the country, that are innovative hubs, boost global trade, attract inward investment and increase productivity. In doing so, the government wants freeports to generate employment opportunities to the benefit of some of our most deprived communities around the UK.

Opportunities for new thinking And cooperation



So...

4. What is likely to happen? And
what you can do?
(3 scenarios)

Course 1 – Wait and Hope

Viable but not prudent

Course 2 – Panic!

Looks a lot like course 1, but with shouting and screaming due to less optimism!

Course 3



**KEEP
CALM
AND
BUILD A
5G NETWORK**

**Private ?
Secure ✓**

Key Take-homes

1. It takes 2 (ports) to tango

- Siloed innovation in ports can give us some benefits, but every ship moves from one port to another
- Closer collaboration is commonsense

2. Interoperability = Competitive Advantage

- 23,000 TEUs of containers arriving at a port in 1 ship – customs, logistics
- Interoperability between port of origin/destination gives efficiencies! (But will the equipment used???)
- These can give your port or operator a key competitive advantage over rivals

3. Public Telco & MNO networks are NOT CNI grade

- Not suitable for use in CNI, and not rated as such. Also not held to same standards of NIS Directive as shipping already is!
- As NIS'd CNI, ***you bear the risk*** of their failure, breach or compromise...
- Private Networks may be an option to consider

4. Spectrum policy means the time to consider private networks is here – 5G

- Manage and control **your** vendor/supply chain **risk yourself**. Many ways to do so. Know what you buy
- Gain guaranteed QoS, define your own power resilience requirements
- Will struggle to run safety-related use-cases over public networks – drones?

‘No thank you’



**Anarchy
in the UK**

Dave Happy

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