

## Case Study - Hutchison Ports Port of Felixstowe DMR Tier III Radio Scheme



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# Clients Profile – Port of Felixstowe

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## Introduction

The Port of Felixstowe is Britain's biggest and busiest container port, handling 42% of the UK's containerised traffic, and one of the largest in Europe. The port handles more than 4million TEUs (Twenty-foot Equivalent Units) and welcomes approximately 3,000 ships each year, including the largest container vessels afloat today – crucially, the port provides some of the deepest water close to the open sea of any European port.

Around 30 shipping lines operate from Felixstowe, offering approximately 90 services to and from 400 ports around the world.

Together with its unrivalled rail and road links connecting the port to distribution hubs in the Midlands and elsewhere in the UK, Felixstowe plays a pivotal role in keeping the UK's trade moving, and delivers real benefits to customers, the community and the industry.

Owned entirely by Holdings Ltd, CK Hutchison is the largest foreign investor to Britain. It is a Hong Kong-based multinational conglomerate that is committed to innovation and technology, and the business employs approximately 270,000 people in over 50 countries around the globe. Its diverse business operations encompass six core activities:

- Ports and related services
- Finance and investments
- Retail
- Infrastructure
- Energy
- Telecommunications

## Best Connections

The population of Britain is geographically spread across the country, with almost 85% of people living outside London. Goods therefore need to be distributed from the Port of Felixstowe throughout the country, quickly and efficiently.

70% of containers coming through Felixstowe are delivered to what is known as the 'Golden Triangle', a region in the middle of Britain where many of the country's main high street brands and online retailers have their National Distribution Centres.

Decades of investment by the Port of Felixstowe in onward transportation connectivity has resulted in the broadest, most frequent connections now being available to get your containers where they need to go, fast. Whether by road, rail or feeder vessel, we aim to offer a range of viable, cost-effective options to provide you with real commercial advantage.\*\*POF Website.

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# Client Requirements and Solution

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## Client Requirements

The Port of Felixstowe is one of the largest users of two way communications in East Anglia, operating 32 individual simplex radio channels across a 3km site.

At time of tender the Port had around 500 mobile radio subscribers fitted to assets such as Ship to Shore Cranes, Rail Cranes, Forklifts and over 250 Internal movement tugs all communicating to shipping co-coordinators located in a central dispatcher environment.

Also around 450 other members of staff communicate using handheld radio.

Over recent years the port expanded and has added additional storage areas and deep water quays enabling the Port to service some of the largest vessels in the world. This has obviously generated more container trade and in doing so has substantially changed the radio propagation characteristics and users are noticing that audio clarity and RF coverage has degrading as the port builds up.

With the port continued expansion in mind the Port of Felixstowe set about the process of improving the basic elements of today's systems whilst specifying features that would allow radio traffic to be more efficiently.

In Brief the Port asked a number of vendors to propose a solution to:

- Improve Radio Coverage across the Port and Key Building.
- Offer better Audio quality minimising background noise and Interference.
- Add a robust Emergency procedure for users in distress or danger.
- Provide centralised dispatching solutions for voice and asset location.
- Integrated into the companies Cisco SIP Telephony system.
- Had no single point of failure and offered 99.999% availability.

# Our Proposed Solution

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Following a careful review of the client's specification we met with Port of Felixstowe to better understand how they worked on a day to day basis and to carry out site surveys to see first-hand where coverage was poor and how potential enhancements and network topologies could be deployed.

From this early phase it was clear that the Port needed a managed system with central or distributed intelligence and that the deployment must not contain any elements of a single point of failure.

This we felt could be met using Private LTE, Tetra or DMR Tier III however after evaluating each technology it was seen that a private LTE system would be complex to install and suitable frequencies would be difficult to obtain, Tetra although offering all the features was complex to use when we took into account that the Port and its 1000 users had no experience of operating in trunked manner. DMR tier III however offered all the features and services and benefited from being simple and intuitive offer features such as:

## Advantages of DMR

- One to One private calls between individuals.
- Group calls that could mimic the current simplex channel way of working.
- Emergency Call with Live Microphone, Emergency Alarm and escalation procedures.
- Text and status messaging.
- On demand and automated vehicle tracking using short data messaging.
- Increased channel capacity giving the Port more talk groups per frequency than the current system.
- Flexible dialling scheme which allowed us to mimic the Selcall numbering system the port used on its analogue channels
- Radio terminals that supported both analogue and digital modes making switch over and any regression a simple and easy task.

## Chosen System and Architecture

Complex DMR systems are available from all the leading radio manufacturers but for the Port the Tier III system from Hytera stood out purely because of its ease of use, configuration and simple and intuitive user interface.

For the Port it gave them a 12 carrier, 24 slot system with computerised dispatchers and a Basestation and server architecture that offered automatic duplication and fail over in the event of a system failure.

We also designed the Power supply and antenna scheme with resilience in mind ensuring that again no failure here would render the port without communications.

## Implementation

After successfully being awarded the contract, RSL appointed a dedicated project manager to act as a single point of contact for the Ports implementation team and to ensure that the project ran on time with high degree of assurance, offering the port the features and services it needed in a new radio scheme.

To kick off the project RSL carried out a series of requirement capture workshops to understand and define who the users were, what their communication needs were and to put together a basis of design. This was supported with a month long proof of concept test where we installed a demonstration Tier III System and radio units into assets allowing key users to get a feel for the system.

Next a full design was submitted to the port detail system architecture, radio features, fleet number and an installation and implementation plan which was soon signed off giving us the go ahead to begin the installation.

Switching the Port of Felixstowe to digital was a big task and needed to be planned very carefully as key assets such as Ship to Shore and Rail cranes are in near 100% use. To accommodate the ports needs RSL placed a team of 4 engineers and a site Supervisor at the port working closely with operations and planning departments to go to each asset and swap out the radio, test it in digital mode and then return it to analogue to work with ports existing channels. The whole process of swapping out some 546 assets took RSL just 4 weeks to complete.

With the subscriber units deployed our attention turned to installing the infrastructure which consisted of two 42U cabinets, 12 Radio Basestation, a suite of management servers, power supplies and antennas with integration into both the Ports Castle Rock SNMP monitoring system and Cisco's call manager telephony product.

Finally with all works carried out software dispatchers were made operational giving vessel and rail controller the ability to make one to one calls, group calls and the ability to monitor and track assets under their control.

User training and training guides were made available throughout the delivery phase so that users would be able to efficiently use the equipment before the 'Go Live' date. The system was installed in analogue mode so that there was no interruption from using the radios as they were being swapped out to the new kit and when the switchover date came, it was just a matter of switching to digital mode on the radio units by pressing a single button.

Come switch over day the Port decided it wanted a phased approach as previous attempts at a "Big bang" style switch over had resulted in delays in communications so RSL placed personnel with each department so that when it was their turn to switch it was carried out swiftly and without issue.

## Outcome

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The project rollout for the Port of Felixstowe took some 6 months to deploy and was successfully completed in late 2017. The Port is extremely pleased with its Tier III products and is already utilising the call and management capabilities. New features such as Over the Air management and remote administration have been added ensuring that communications are easy to use, easy to maintain and are efficient.

The Hytera Tier III system was installed to high quality standards and to the customer's satisfaction, using the initial project plan for implementation procedures signed off early in the Project.

As requested The port were provided with a radio scheme that provided improved communication across operations, rail and marine departments with the extra functionality they desired, yet still mimicking the elements they requested from their previous system.

We have a good relationship with the Port; and this was key allowing us to provide support whilst gaining their requirements easily. Overall, RSL provided an effective and innovative system that met specifications with the potential for future video equipment to work alongside this system as requested.