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L’utilizzo delle tecnologie wireless in ambito Oil & Gas per la realizzazione di infrastrutture mission critical

Alessio Murroni
Western Europe Regional Sales Director
Assago – 20th May 2015

CAMBIUM NETWORKS

Industry leader in Point-to-Multipoint and Point-to-Point IP Wireless Broadband Solutions

Products and platforms spanning 900MHz – 38GHz

Uniquely positioned to deliver breakthrough scalability, reliability, and secure outdoor broadband solutions

More than 4.5 million nodes shipped to thousands of networks in over 150 countries

Global Company with local presence in 25 + countries

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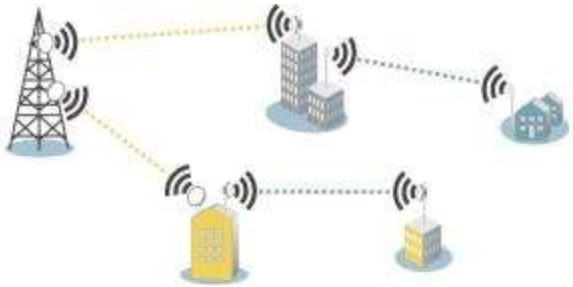
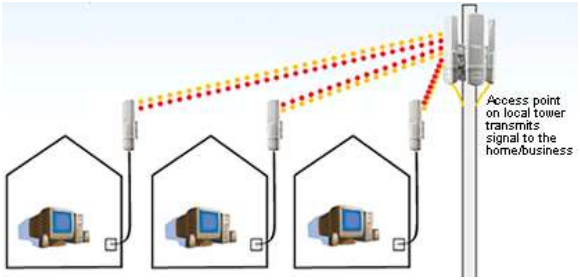
CAMBIUM'S TECHNOLOGY

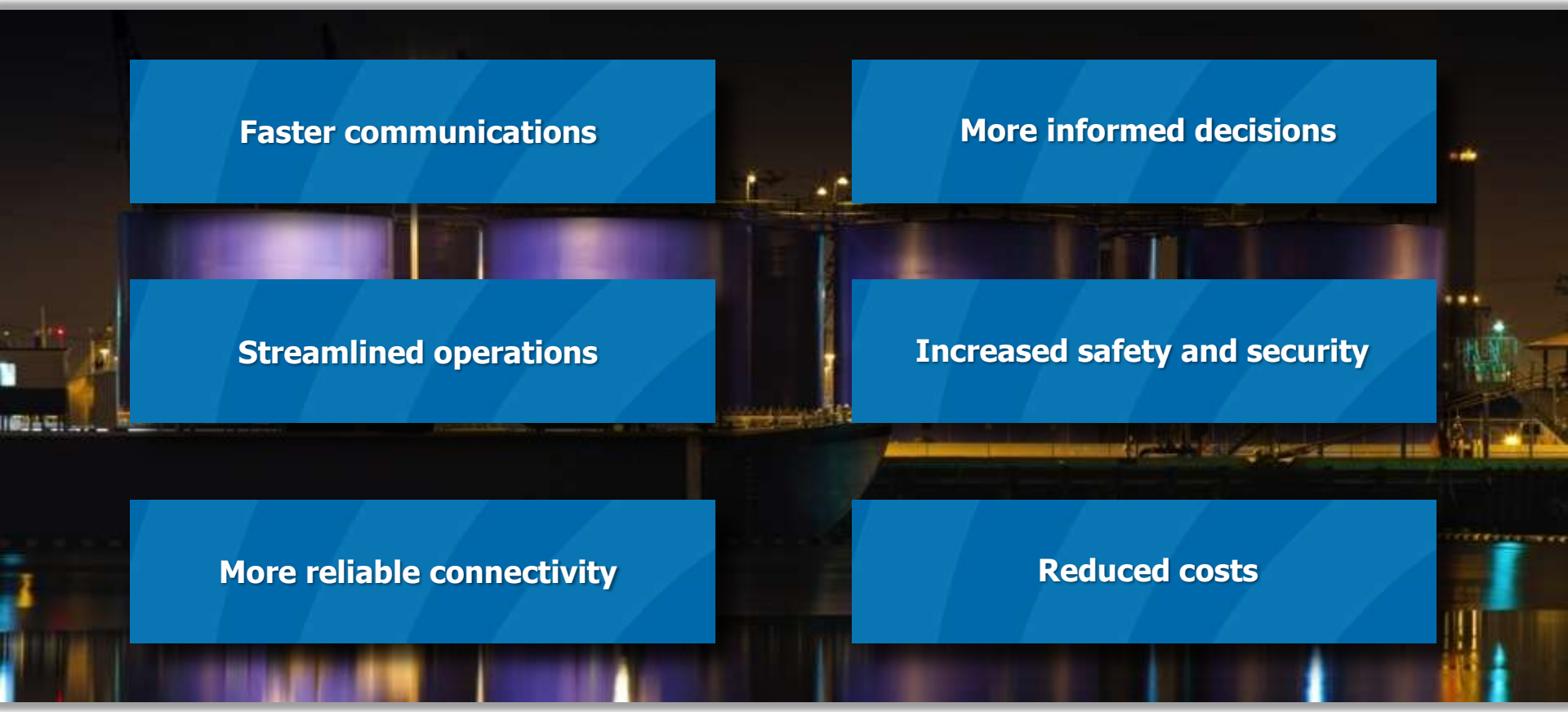
Benefits of Fixed Wireless	Point to Point (PTP)	Point to Multipoint (PMP)
Fixed wireless is the most cost effective solution for deploying broadband connectivity:	• High-speed wireless data link between two sites • GigaBit bandwidth links	• Last mile access and distribution • Up to Mbps bandwidth x AP, 1.5 Gbps per site

- **Scalable**
- **Reliable**
- **Outdoor**
- **Performance**





CAMBIUM PETROCHEMICAL BENEFITS



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HIGH PERFORMANCE
WHERE YOU NEED IT **MOST...**

...AND EXPECT IT **LEAST**.

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PLATFORM-TO-VESSEL COMMUNICATIONS

An oil company needs reliable communications between an offshore platform and rotating collection vessels

Replace costly, low-performing satellite connections

Both voice and data connectivity is required for over-water path distances of 9 and 12 miles

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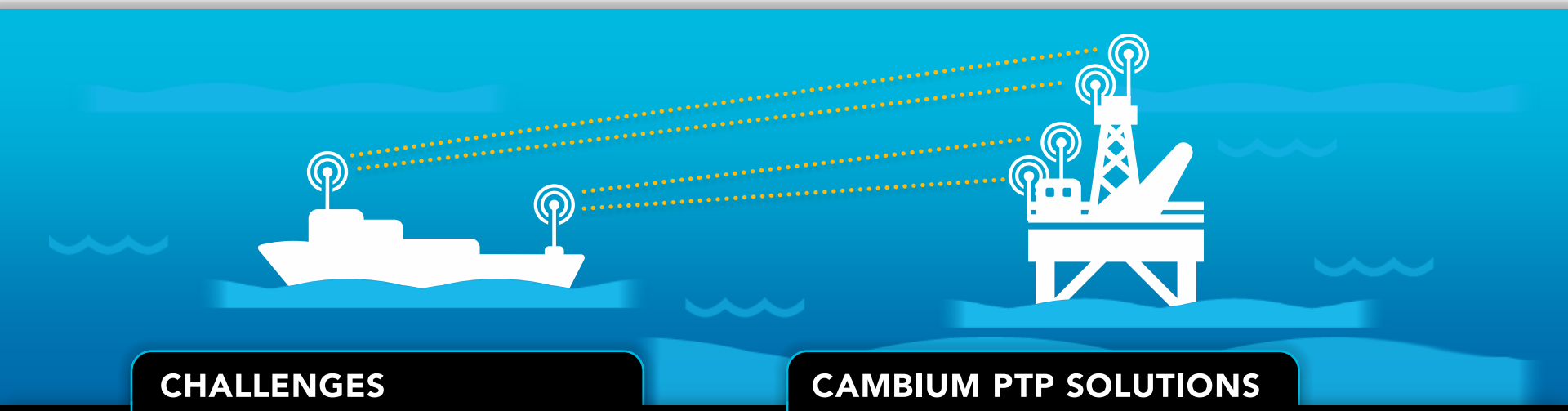
PLATFORM-TO-VESSEL COMMUNICATIONS



CHALLENGES

- Long distance connectivity over water
- Non-Line-of-Sight frequency paths
- Harsh saltwater environments

CAMBIUM PTP SOLUTIONS

- Spatial diversity
- MIMO
- Low latency
- OFDM
- Ruggedized equipment

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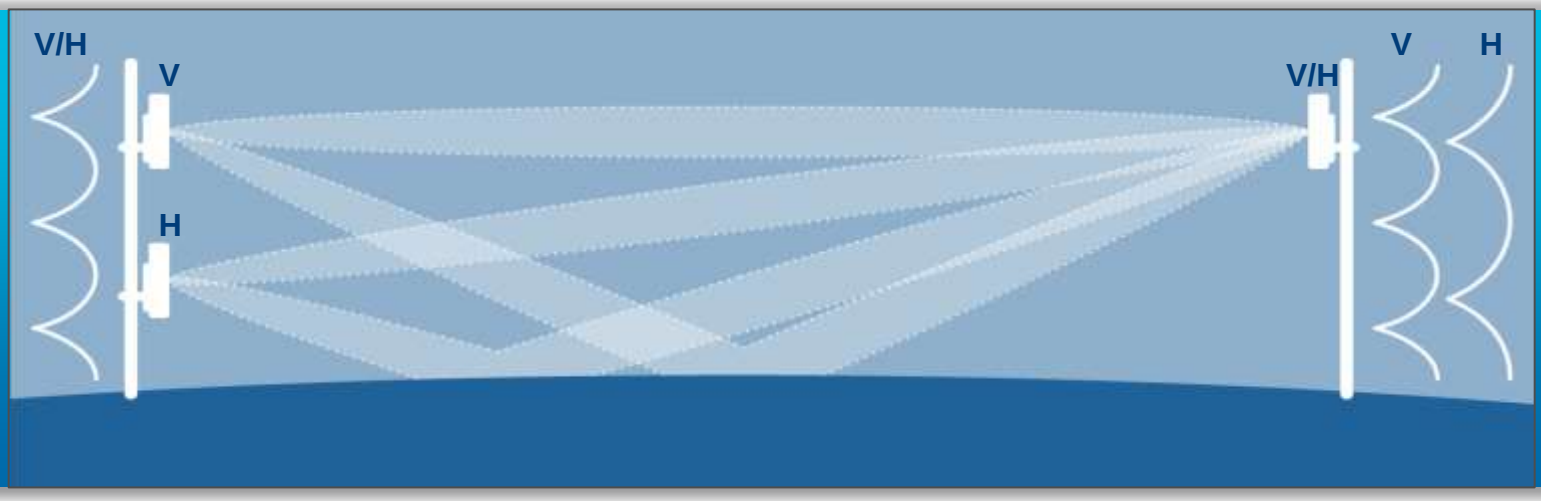
PLATFORM-TO-VESSEL COMMUNICATIONS
SPATIAL DIVERSITY



IDEAL OVER WATER AND FLAT TERRAIN

Wireless signals across water or hard surfaces (desert) pose performance and reliability challenges:

- Highly reflective surfaces create multi-path interference
- Varying water heights create over-sea challenges

Spatially diverse antennas can mitigate the ducting and fading that is typical over water and desert.

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OIL FIELD COMMUNICATIONS

There is always significant interference on oil fields where multiple drilling operations co-exist

Multiple users are constantly transmitting SCADA and other data using the same frequency

Need wireless communications networks that mitigate against interference to ensure high performance and reliability

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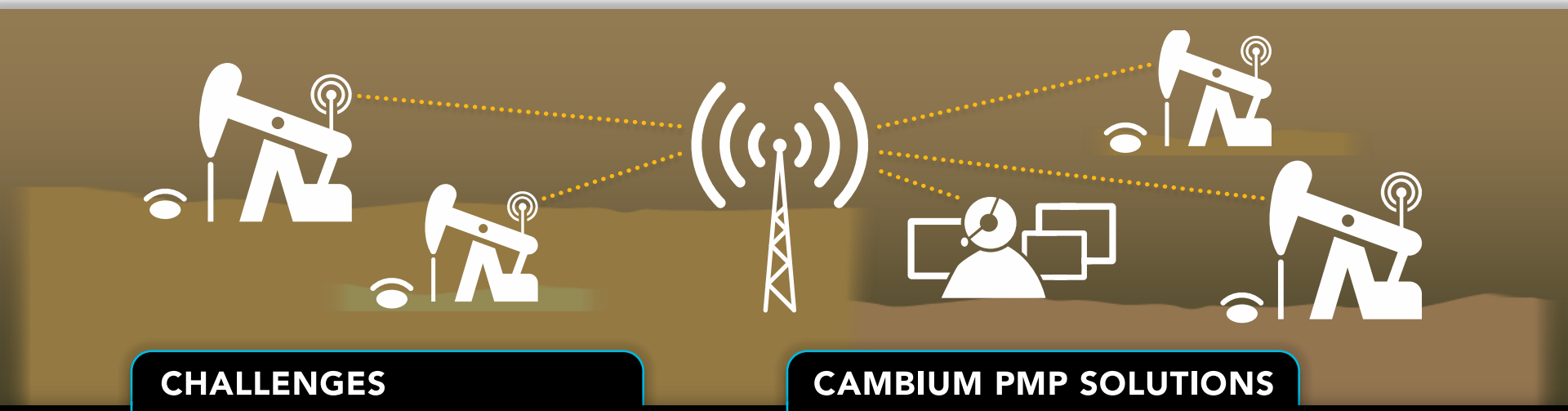
OIL FIELD SCADA COMMUNICATIONS



CHALLENGES

- Interference riddled environment
- Multiple users on same frequency
- High noise floor
- Dropped and faded signals

CAMBIUM PMP SOLUTIONS

- Unique receiver sensitivity
- GPS synchronization
- FSK Air Interface Protocol
- Low C/I Ratio

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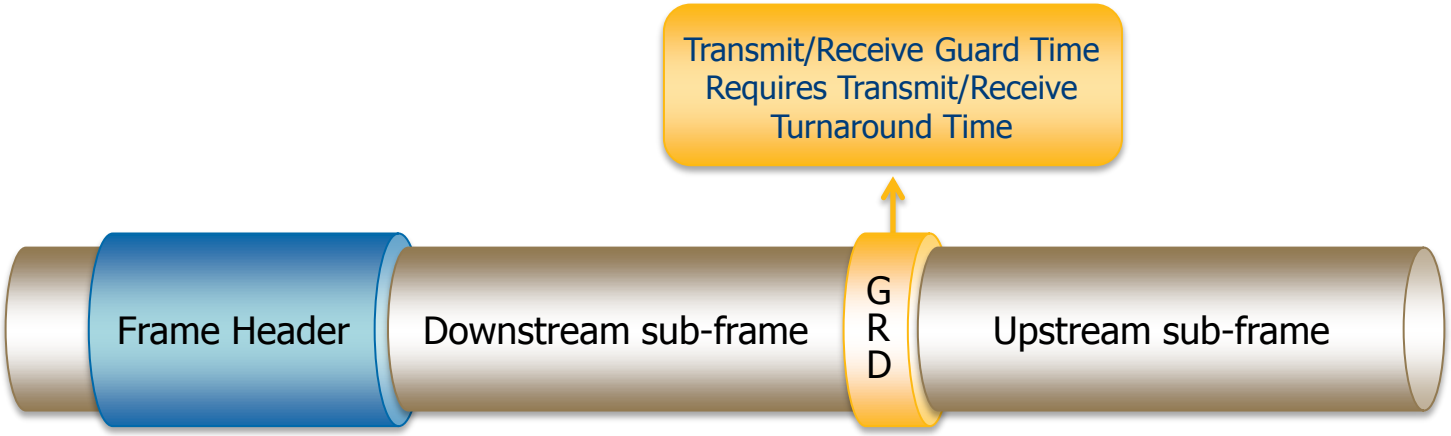
OIL FIELD COMMUNICATIONS
CONSISTENT DATA TRANSFER



Cambium PMP Scheduled TDD Orderly Access

Cambium PMP reduces idle time and provides consistent data transfer

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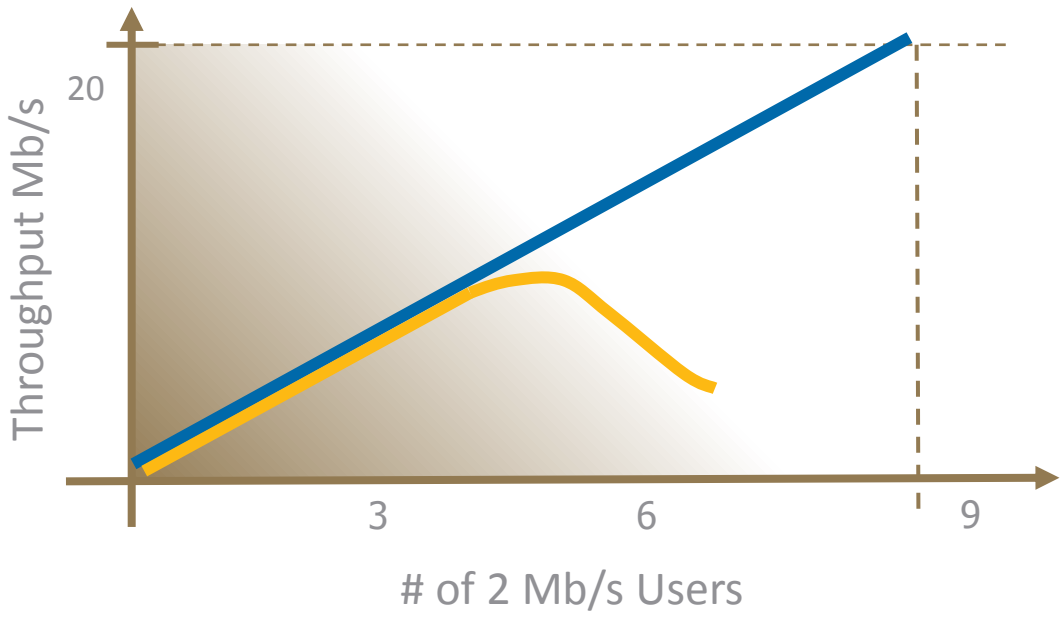
OIL FIELD COMMUNICATIONS
COMPETITIVE TECHNOLOGY



- Access as needed / Collisions and Backoff

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CAMBIUM WORKS
WHERE OTHERS DON'T.

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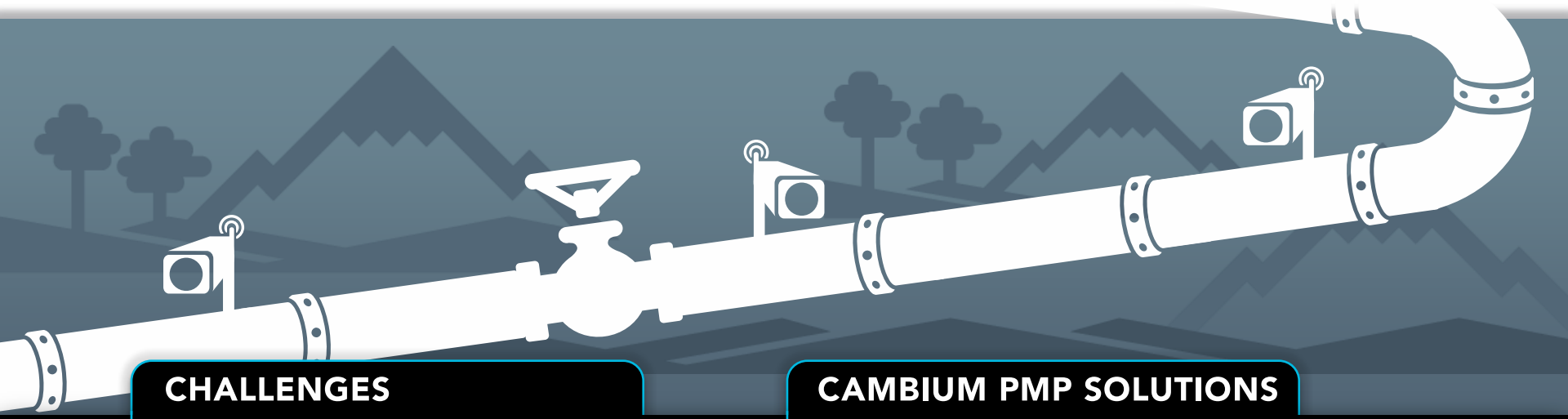
PIPELINE VIDEO SURVEILLANCE



CHALLENGES

- Remote location
- Regular visual inspection
- Need for clear, real-time video images

CAMBIUM PMP SOLUTIONS

- Low latency
- Built-in QoS
- FSK air interface
- Prioritization Polling
- Long distance backhaul

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PIPELINE VIDEO SURVEILLANCE

A natural gas company has thousands of miles of pipeline, plus multiple remote pumping stations and substations

Constant visual monitoring is essential for ensuring security

Video is more effective than ground or aerial monitoring

Video images must be high quality, without delays, and without being blurry or choppy

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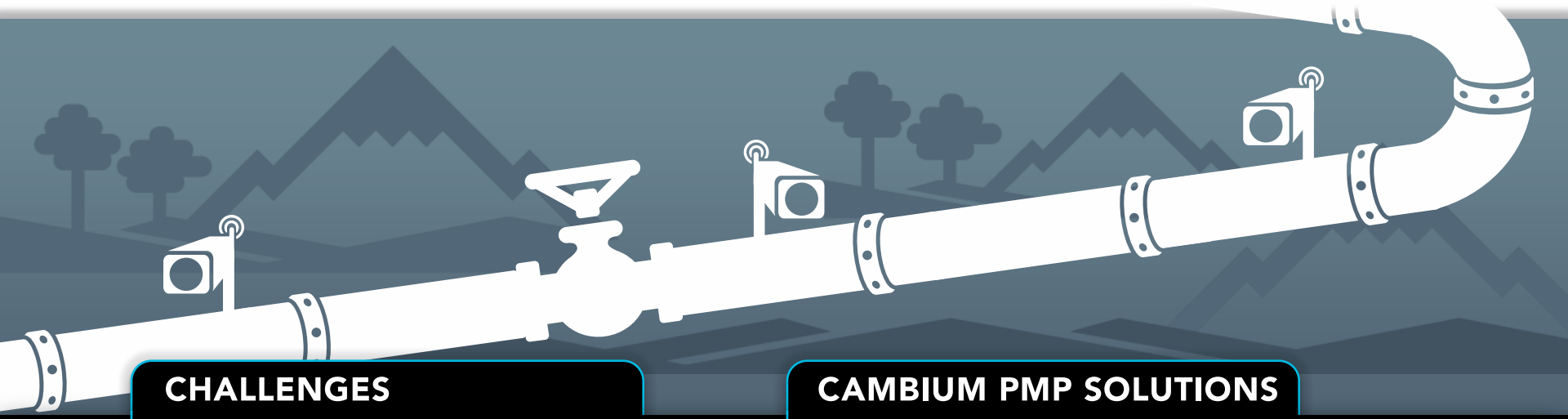
PIPELINE VIDEO SURVEILLANCE



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CAMBIUM PMP SOLUTIONS

- Low latency
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CAMBIUM NETWORKS' PTP PORTFOLIO

MEAN TIME BETWEEN FAILURE

40 Yrs < PTP 100/200
141 Yrs < PTP 300/500
441 Yrs < PTP 600
80 Yrs < PTP 800 ODU
58 Yrs < PTP 800 CMU

TEMPERATURE RANGES

PTP 100/200 > -40º to +131º F
PTP 300/500 > -40º to +140º F
PTP 600 > -40º to +140º F
PTP 800 > -27º to +131º F

More than

2.2 BILLION FIELD HOURS

confirm the durability of our PTP products

WIND SPEED SURVIVAL

118 mph < PTP 100/200
202 mph < PTP 300/500
202 mph < PTP 600
150 mph < PTP 800

CERTIFICATIONS

FIPS 140-2
IP66 Rating
MEF9
ATEX and HAZLOC

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PTP 600 ATEX/HAZLOC

- Target Markets:
  - PetroChem
  - Utility (Generation and Transmission)
  - Defence
- Solution:
  - PTP 600 Series
  - 5.4GHz and 5.8GHz
  - ATEX and HAZLOC Compliant
  - Dedicated SKUs
- Value Proposition
  - Universal radio for all applications
    - Non LOS
    - Over Water
    - Over long distance
    - High RF interference
  - Avoid expensive NEMA
  - Established field reliability
  - Easy to plan and install link


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ATEX & HAZLOC APPLICATION BRIEF

IN YOUR **SPACE SAFETY** IS **NON-NEGOTIABLE**

The oil and gas industry literally fuels our global economy, and growing demand necessitates the highest level of engineering, productivity and safety. Every aspect of exploration, extraction and refinement must be carefully orchestrated to operate continuously and maximize profits. Achieving this high level of operational excellence is not possible without advanced data, voice and video communications.

Wireless Ethernet is fast becoming the preferred communication delivery system due to its excellent reliability, adaptability and affordability. However, your communication systems should be ATEX and HAZLOC certified to assure safe operations in your potentially hazardous environments.

ATEX AND HAZLOC CERTIFIED WIRELESS

orks™

PTP PORTFOLIO OVERVIEW

FEATURE	PTP 100	PTP 200/230	PTP 250	PTP 500	PTP 600	PTP 650	PTP 800/810
							
RF Bands (GHz)	2.4, 5.2, 5.4, 5.8	200 - 4.9 230 – 5.4, 5.8	5.4- 5.8 Dual Band	5.4, 5.8	2,5, 4.5, 4.8, 4.9, 5.4, 5.8, 5.9	4.9 – 6.05GHz Wideband	6 – 38 GHz Licensed
Max. Throughput	14 Mbps *	200 –21 Mbps * 230 –50 Mbps *	256 Mbps *	105 Mbps *	300 Mbps *	450 Mbps *	800 -368 Mbps 810 -696 Mbps
Tx Power	Up to 22dBm	200 –18dBm 230 –19dBm	Up to 22dBm	Up to 27dBm	Up to 25dBm	Up to 27dBm	Up to 30dBm i - Up to 34dBm
Channel Bandwidths	20	200 – 10 230 – 10/20	20/40	5/10/15	5/10/15/20/30	5/10/15/20/ 30/40/45	7-56
Max. LOS Range	35 / 56	200 –15 /24 230 –80 /129	34 mi (54 km)	155 mi (250 km)	124 mi (200 km)	124 mi (200km)	124 mi (200km)
Max. NLOS Range	NA	NA	NA	6 mi (10 km)	5 mi (8 km)	5 mi (8km)	NA
Security	56-bit DES 128-bit AES	56-bit DES 128-bit AES	128-bit AES	128/256-bit AES	128/256-bit AES, FIPS 140-2	128/256-bit AES FIPS 140-2 (future)	Proprietary/ Optional 128/256-bit AES & FIPS 140-2

* Aggregate throughput

CAMBIUM NETWORKS' PMP PORTFOLIO

MEAN TIME BETWEEN FAILURE
40 Years
< PMP 100/320/400/430/450

TEMPERATURE RANGES
PMP 100/320/400/430/450
> -40º to +131º F

MILLIONS OF DEPLOYED PMP PRODUCTS
demonstrate our reliability day after day

WIND SPEED SURVIVAL
118 mph

LATENCY
3.5, 7.5 and 25 milliseconds

SECURITY
DES, FIPS 197 AES

CERTIFICATIONS
FCC
Industry Canada
CE

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PMP PORTFOLIO OVERVIEW

FEATURE	PMP 100	PMP 400	PMP 430	PMP 450	*e*PMP
					
RF Bands (GHz)	900 MHz, 2.4, 5.1, 5.2, 5.4, 5.8, 5.9, 6.05	4.9	5.4, 5.8	2.4, 5.4, 5.8	5.1, 5.2, 5.4, 5.8
Max. Throughput	14 Mbps Per sector	20 Mbps Per sector	50 Mbps Per sector	125 Mbps Per sector	200 Mbps Per sector
Tx Power	23 dBm	19 dBm	19 dBm	22 dBm	Up to 23dBm
SM per sector/AP	Up to 200	Up to 200	Up to 200	Up to 238	Up to 40
Max. LOS Range	40 (64 km)	30 (48 km)	30 (48 km)	40 (48 km)	13 mi (20km)
NLOS	900 only	nLOS	nLOS	nLOS	nLOS
Security	56-bit DES 128-bit AES	56-bit DES 128-bit AES	56-bit DES 128-bit AES	56-bit DES 128-bit AES	128-bit AES

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IN THE PETROCHEMICAL INDUSTRY, **CAMBIUM SOLUTIONS WORK** WHERE OTHERS DON'T.

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THANK YOU