

TETRA Solutions For Oil & Gas



A Scalable Critical Communications Solution



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Enterprise Mobility Solutions from Motorola ...



Unparalleled Portfolio

Radio Solutions



ASTRO 25



TETRA



Professional
Commercial
Radios



Video
Security



Wireless
Broadband



Wireless
Security



WLAN



Advanced
Data
Capture



Mobile
Computing
Devices



RFID

Wireless Network Solutions

Enterprise Solutions

Horizontal Solutions

Mission Critical Operations

Disaster Management

Advanced Video Security

Case Management

Network Extensions

Voice

Inspections, Code Enforcement

Asset Management & Accountability

Inventory & Warehousing

Wireless Agility

Mobility Management & Security

Workforce Mobility

Vertical Markets

Energy

Telecom

Oil & Gas

Education

Government

Retail &
Hospitality

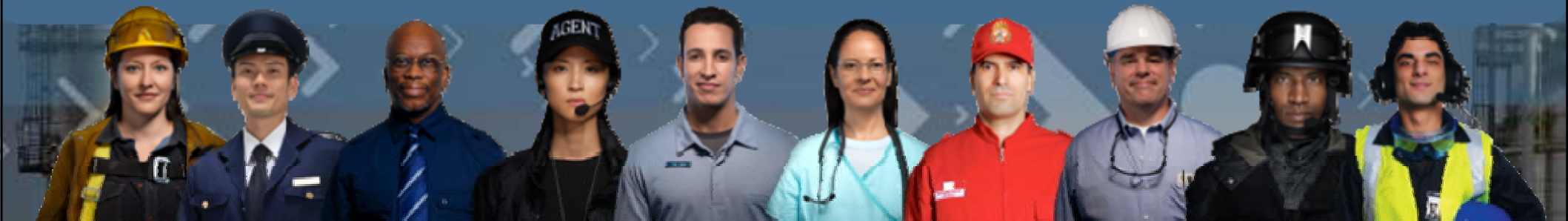
Transportation
& Logistics

Manufacturing

Professional
Services

Wholesale

Product Leadership: #1 Market Share



Product Offering



Bar Code Scanning



RFID



Mobile Computing



Voice



Wireless Networks



Radios



Software/Services



Global Services

Product Leadership:

#1 SHARE



TETRA Globally
ASTRO Globally
Radio Products
Mobile Computing
Advanced Data Capture
Enterprise Radio Networks
RFID
Unlicensed Wireless Broadband

Agenda



Why TETRA

Why Motorola

Why Motorola TETRA

Why TETRA?



A proven, user driven standard

TETRA

Motorola key contributor to ETSI standard
Motorola founding member of TETRA MOU



Secure



The Standard

Developed by ETSI
Open digital standard
TETRA feature set for mission critical users
Spectrum efficient

A Success

TETRA Association represents 130 organisations from all over the world
200 companies are involved in the development of applications
Over 40% of nations have adopted TETRA

Agenda



Why TETRA

Why Motorola

Why Motorola TETRA

Motorola: Leadership in TETRA



Motorola TETRA

Over 1,500,000
terminals delivered

600+ Customers

Used in 100
countries worldwide

Leader in Scalable TETRA Solutions



Proven Expertise in Oil and Gas



Motorola TETRA Oil & Gas Customers

Upstream

Nigeria Oil & Gas Fields; Karachaganak Oil (Kazakhstan);
Sibur Tyumen Gaz (Russia); Shell Salym (Russia);
Sakhalin 1 (Russia); Sakhalin 2 (Russia); Sichuan (China)

Midstream

Nigeria Pipeline; Turkmenistan Pipeline; Botas (Turkey);
Gazprom Transgaz Makhachkala (Russia);
North East Russia Oil Pipeline

Downstream

Petrochemical Plant (Malaysia); BASF Petronas (Malaysia);
Reliance Jamnager Oil Refinery (India);
Petrom S.A. Oil Refinery (Romania); Total Oil (France);
OMV Refinery, Schwechat (Austria);
Ormen Lange - Nyhamna Land Plant (Norway); Shell (Holland);
SK Corp Oil Refinery (Korea); IT Eurocom Gela Refinery (Italy)

plus other awards (including confidential awards)

Motorola's Oil & Gas Solution in Nigeria



Nigerian Requirements

Radio coverage in production area of the Nigeria Delta

A system suitable for operational needs such as staff coordination, logistics, transportation coordination

TETRA & marine channels Integration for interoperable communications

A solution to counter criminal activities

Motorola's Solution

TETRA solution covering approx 3.200 Km²
with 8 sites (3 offshore)

Over 2,000 users

Full range of telephony services

TETRA secure data capabilities
including authentication and encryption

Agenda



Why TETRA

Why Motorola

Why Motorola TETRA

Considering Oil & Gas



Drivers to Invest in Wireless

Upstream

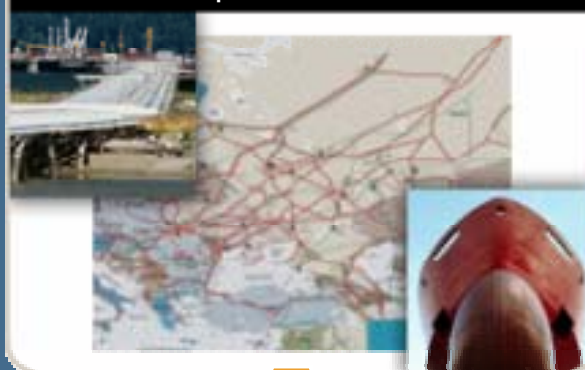
Exploration - Production



- Achieve Cost Reductions and Operational Efficiency
- Monitor & Control Platforms Remotely
- Enhance Employee Safety
- Regulatory Compliance

Midstream

Transport and Process



- Security of supply and environment protection
- Remote Pipeline monitoring and control
- Disaster Recovery
- People & Vehicles Tracking

Downstream

Refining, Marketing, Distribution



- Protect assets, maintain operations
- Improve Workforce Productivity
- Managing Data, Assets and People
- Safety, Disaster Recovery

How can TETRA meet these needs?

A Complete TETRA Solution



Services

Infrastructure



Complete switches portfolio

Terminals



Complete terminals portfolio

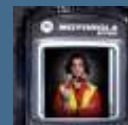
Software



Man down



Messaging



WAP Push

Integrated Terminal Mgmt & latest SW

Accessories



Audio | Energy Carry | Mobile

Extended



Mobile computers, scanners, RFID, WLAN, 2way radios

One stop shop

Fully integrated solutions for long term performance.

Customised solutions to meet specific customer needs

Extend solution with wider enterprise portfolio

A Complete Oil & Gas Solution



Requirement	Example
Flexibility	Add features/users/coverage when required
Efficiency	Efficient group call capabilities required for maintenance, production, safety and security staff
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Value	Cost effective solutions to manage the network

Key Oil & Gas Requirements



Flexibility

Enable phased expansion to meet future requirements. For example:

- additional users groups being added, expansion of operations geographically, enhancing onshore & offshore operations and adding more voice & data services in trunk network

Flexible communications that can be easily adapted to meet changing needs:

- Voice
- Data
- Staff safety features
- Security

Flexible solution that can meet geographically different communications requirements

- From single site petrochemical facilities to the wide area demands of oil fields and pipelines.

Start with the basics...



Integrate

Integrate with existing solutions such as analogue systems and paging networks



Core Voice & Network Services

A modular approach allows users to deploy core services and grow as you go.

And grow as you go...



Integrate

Integrate with existing solutions such as analogue systems and paging networks



Core Voice & Network Services

A modular approach allows users to deploy core services and grow as you go.



"Grow as you Go"

As requirement increases or budgets become available



Coverage & User Capacity



Features & Services

“Grow as you Go”



Coverage & User Capacity

Dispatch



Add more...

Dispatchers positions (remote if req'd)

Wireless Dispatchers

Base Stations



Add more...

MTS Base Stations

In-Building Coverage

Network Management



Add more...

Network Manager Terminals

Subscribers



Add more...

Handportables

Mobiles



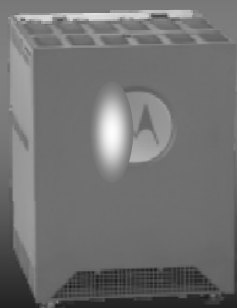
Expanding Portfolio of Base Site Solutions



**Coverage &
User Capacity**



MTS1



MTS2



MTS4



MTS4E



Increasing Deployability

Increasing Capacity

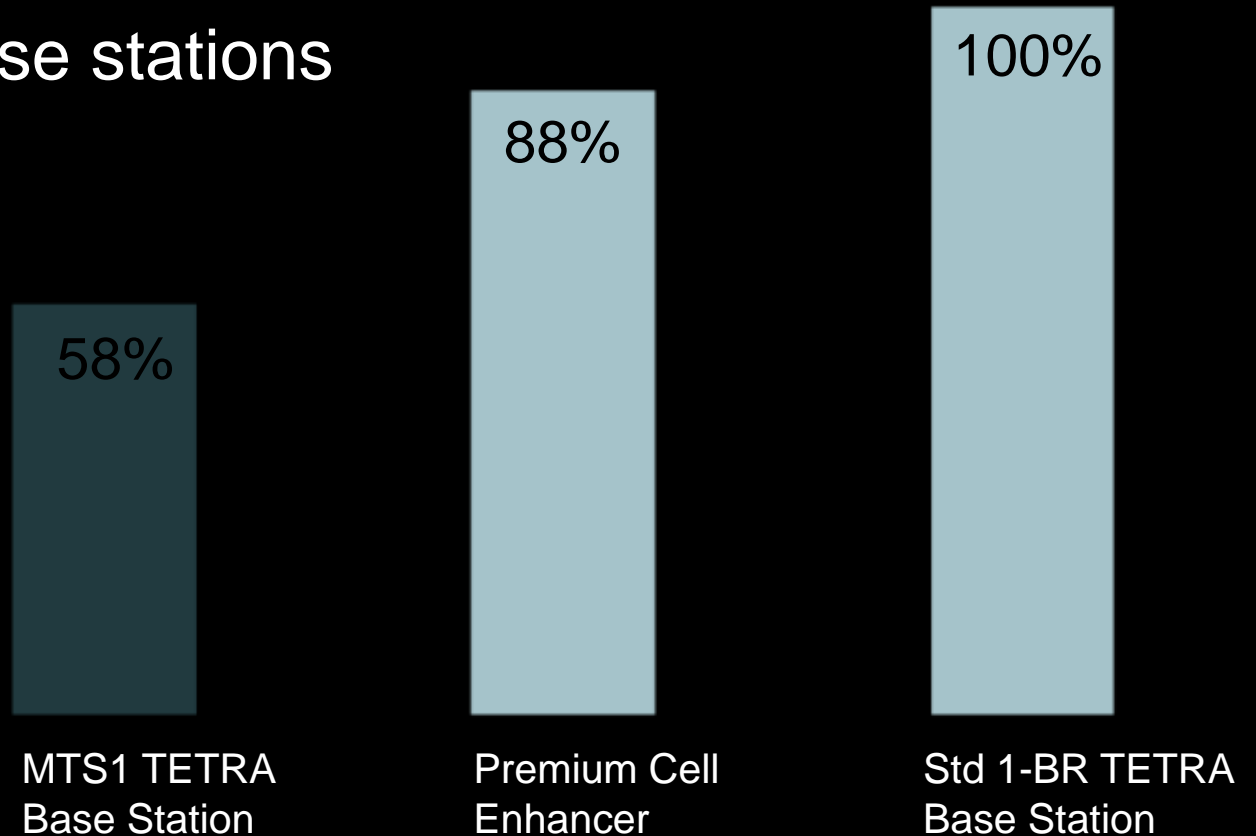
MTS1: Relative 5-Year Total Cost of Ownership



Coverage &
User Capacity

MTS1 enables 40%+ TCO reduction
compared to standard base stations

Inexpensive Ethernet site links
Lower power consumption
Reduced site rental
Simplified I&C



“Grow as you Go”



Features & Services

Short Data

Assigns tasks, monitors status and locates resources

Packet Data

Integrated data enhances your business efficiency

Telephony

Communicates with staff on their office or mobile phones

Core Voice & Network Services

Years of experience have resulted in a proven network architecture & comprehensive services

Security

Ensures no unauthorised access to your network or communications

Network Resilience

Ensures network availability

Voice Recording

Provides a complete audit trail

“Grow as you Go”



Features & Services

Radio Messaging System Application

improves operational efficiency in the field with advanced status messaging.

Call Out provides a fast and efficient way of alerting users of an incident and managing users at an incident.

WAP Push delivers the right information to the right person at the right time.



“Grow as you Go”



Features & Services

Man Down Application

Using two different methods the terminal can be setup to automatically activate in the event the user is seriously injured or incapacitated.

The radio goes into emergency mode if it does not detect motion for a short, configurable, period of time.

Using an advanced tilt sensor the radio goes into emergency mode if it moves past a preprogrammed angle.



A Complete Oil & Gas Solution



Requirement	Example
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Key Oil & Gas Requirements



Efficient Oil & Gas Operations

- Efficient communications critical to increase operational efficiency and employee effectiveness
 - Across upstream, midstream and downstream locations
- Efficient group call capabilities required for maintenance, production, safety and security staff
 - Dispatcher controlled groups
- Individual and telephony calls a lesser requirement
- Emergency communication capability crucial to ensure safety of people and assets

Enabling Efficient Operations



Group Call

Highly efficient one-to-many conversation, fast and easy to set-up

Individual Call

GSM like one-to-one full duplex conversation

Telephone Call

Full duplex communication with landline and cellular phones

Emergency Call

Easily accessible emergency button - emergency calls have highest priority

Priority Call

Ensures the success of key, priority calls

Announcement Call

Enables calls to be made to multiple groups

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Key Reliability Requirements



Reliability and System Availability

- A reliable and resilient communication system is the top concern of Oil & Gas users (IDC, Future Tech Research 2009)
- Reduce the possibility of an event that would require the facility (well, pipeline, plant) to be shut down & the associated financial implications
 - A typical oil pipeline will pump around \$3 million worth of oil/hour
 - A typical refinery will produce around \$6 million worth of fuel/day
- Smooth running, available operations lead to more efficient operations
- Guaranteed communications availability in times of crises
- Always available communications enhances staff safety - for example, to ensure the effectiveness of man down or emergency shut down communications

Why TETRA for Availability?



Consider an Incident



Public Reaction

Phone friends,
colleagues or
family

Impact

Public networks
become
overloaded

TETRA Offers a Robust and Reliable Alternative

- Dedicated network for private communications
- Enhanced resilience
- Emergency and priority calls

Ensuring TETRA Availability



Quality

Terminal quality tests and certification
System acceptance tests on every system sold
Established processes



Features

Disaster recovery solutions
Fall back solutions
Redundancy options



Processes

Supply chain
Product introduction
Testing
Support
Dealer accreditation



Support

Complete portfolio from:
Repair & return
Technical support
Field support
Planning & integration



Ensuring System Availability



Proven, Even in the Most Difficult Circumstances

Highest Reliability

Ensuring components do not fail in the first place (MTBF)

Fallback Solutions

Enabling alternative means of providing service in the event of a failure

Resilient Solutions

Ensuring continued operation even in the presence of faults

Disaster Recovery

Minimising loss of service in the event of a disaster

Services & Support

From designing the optimal solution to providing a complete support portfolio

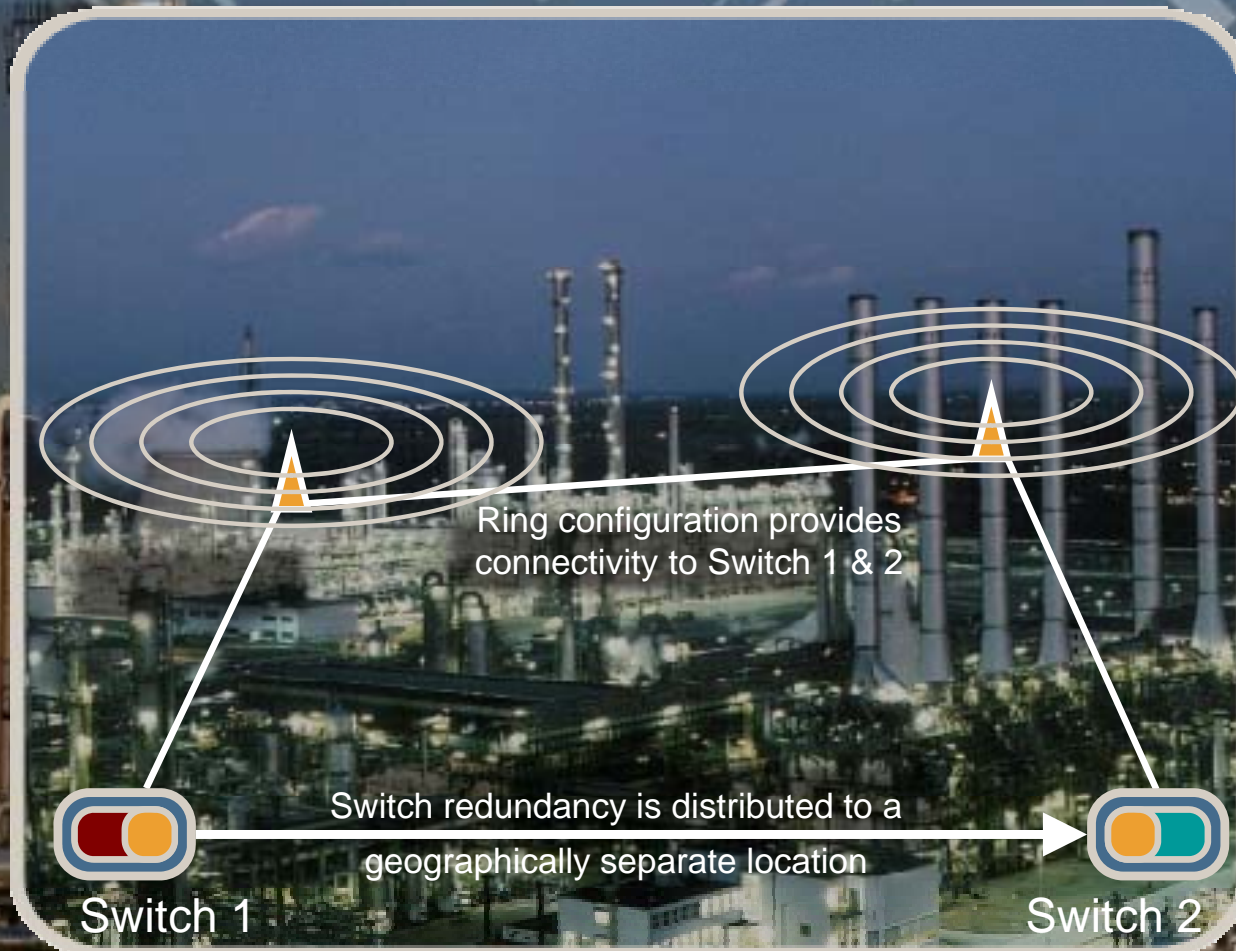
Expansions & Upgrades

Maintaining availability during network expansions / upgrades with minimal downtime

Geographic Redundancy



Optional Availability and Resilience*



Consider an Incident

- Acting as a geographically separated switch
- If one switch fails then the other switch automatically provides near instantaneous connectivity
- Flexible solution that can be tailored to meet budget
- Helps ensure continued operations in the event of a disaster

* Availability depends on platform selected

Engineered for Longevity



Terminal Longevity

Rugged and versatile product design plus Accelerated Life Testing (ALT) ensures our solutions meet and exceed all international quality and performance standards.

Exceeding requirements of all 11 categories in the MIL-STD 810 designed to simulate over 5 years operation in even the harshest conditions.

And it Works. All our terminals comfortably exceed the ALT goal of over 5 years hard usage



A Complete Oil & Gas Solution



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Key Oil & Gas Requirements



Data Communications

Remote monitoring and other telemetry applications

- Remote wellhead and reservoir monitoring
- Pipeline monitoring
- Controlling valves
- Fire and gas detection
- Remote activation of control systems including emergency shut down operation

People & vehicles tracking

- Locate workers working on pipelines. Important for audit purposes (which operation was carried out where by whom)

Possible applications to improve operational efficiency & task management

- Use messaging for work ticket management
- Usage WAP to download a task lists
- Filing reports over TETRA - fewer returns to base

Mobile Data and Location Solutions



Mobile Data Solutions

Motorola delivers complete solutions to provide information at the point of decision

- Infrastructure & devices
- Data enabled (SDS, PD, MSPD, GPS, WAP)
- Mobile computing solutions
- Complete SCADA/telemetry solutions

- Software application development
- Industry standard platforms

- Integration & service capabilities

- Secure, available & resilient

Location Solutions

Location solutions can:

- Reduce response times
- Improving staff and general public safety
- Sending closest vehicle/person improves efficiency
- Improved tracking and reporting

Motorola offer a complete solution:

- MotoLocator (a location tracking solution)
- Devices
- Infrastructure
- Full integration support

Motorola's TETRA Data Solution



Data Communications

End to end solution

Infrastructure, devices,
applications and services

Meets key requirements

Secure, available, resilient,
cost effective

Maximum efficiency

Highly efficient data solution
will reduce capacity
requirements as data usage
increases

High performance

Up to 4 times faster with
Multi-Slot-Packet-Data

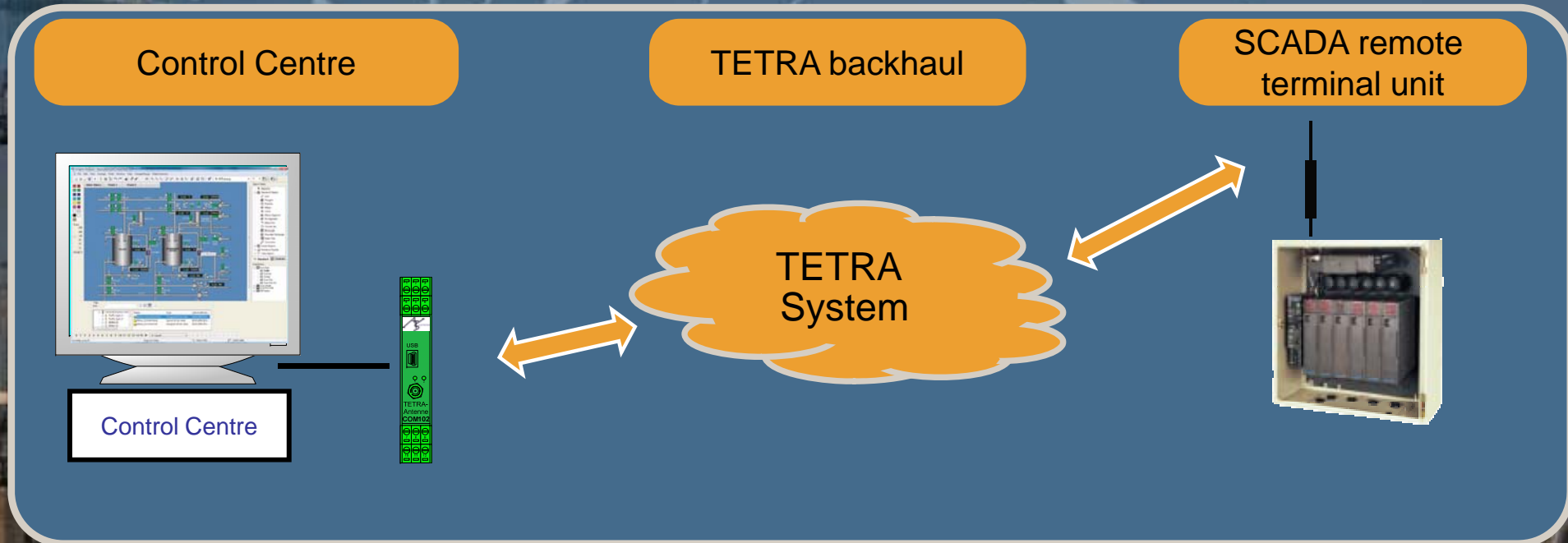
Future proof

Integrated all IP network
supports future as well as
current applications

Proven

Deployed since 1999,
hundreds of active
customers

TETRA Telemetry



TETRA Telemetry Solutions can:

- Use TETRA Network to connect to remote SCADA Terminals and RTUs
- Use TETRA Packet Data for Real Time Control
- Ideal for pipeline monitoring:
 - Measure/change pressure & flow; cathodic protection; leakage detection; valve control
- Also use to switch devices on/off, monitor storage tanks, remotely fill oil tanks etc.

Emergency Shut Down Solution



Emergency shut down sent via TETRA to required Radio Terminal Units in one transmission

Control Centre



Master Control Centre



Radio

RTU

RTU

RTU



Security Patrol Solution



Solution

- Smartcards installed throughout patrol area
- Cards read by reader attached to guards radio
- When read, sends SDS message to control
- Movement sensor with 'dead man alarm'

Benefits

- Enhanced security and safety:
 - Details where the guard is on the patrol
 - Raises alarm if guard late to reach next control point
- Provides audit trail of patrol



Scanner solution attached to TETRA radio

A Complete Oil & Gas Solution



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Key User Environment Requirements



User environment and interface

Environment and Interface

- Need for rugged, intrinsically safe equipment to work in hazardous working environments
- “Man down” capability necessary for lone workers (security guards, people working on inventory in explosive environment)
- Need to be capable of operating in very noisy working environments
- Need to be customisable to meet specific user needs

Motorola's Device Portfolio



Portable



MTP850, MTP830S
MTP850S, CEP400

Mobile



MTM5400,
MTM800E

Specialist



MTP850Ex
TCR1000, TOM100

Accessory



Audio | Energy
Carry | Mobile

Tools



Integrated Terminal
Management
Software Upgrades
& Options

Common, high quality interface for ease of use and training

Comprehensive, Proven Feature Set

Enhanced Data Capability

Integrated Solutions

Tested. Proven. The Market Choice. Made by Motorola.



ATEX TETRA PORTABLES. SAFETY REDEFINED

MTP850 Ex ATEX PORTABLE



ATEX Dust & Gas Certified

Best-in-class audio

Worlds' leading ATEX TETRA solution

ATEX ACCESSORIES



ATEX Dust & Gas Certified

Excellent performance through matched audio profiles

Motorola & 3rd Party approved accessories

Unfailing Design for Unpredictable Situations



**DESIGNED TO BE STRONG AND SAFE FROM THE INSIDE OUT.
DESIGNED TO MEET ATEX STANDARDS.**

RUGGED BODY DESIGN

- High-strength chassis
- Sealed casing to keep dust and gas out
- Durable plastic outer housing resists **high impact** shocks and drops, such as dropping a 1kg steel ball on all faces of the radio – including the lens!

ROBUST SPECIFICATIONS

- Meets or exceeds stringent MIL-STD specifications
- Tested to meet or exceed Motorola ALT™

ROBUST PERFORMANCE

- Class leading RF specifications designed to maximize operational range
- Class leading audio performance



DESIGNED BY MOTOROLA.

MADE BY MOTOROLA.

BACKED BY MOTOROLA

Unfailing Design for Unpredictable Situations



**DESIGNED TO BE STRONG AND SAFE FROM THE INSIDE OUT.
DESIGNED TO MEET ATEX STANDARDS.**

DESIGNED FOR USE

- Large ergonomic buttons for ease of use
- Optimized for industrial use
- Virtual Keypad, for full alphanumeric text entry

EFFICIENT

- Highly efficient & safe 7.4V energy supply, optimal solution for ATEX certification
- More efficient design = better battery life
- Tried and tested – around the world



DESIGNED BY MOTOROLA.

MADE BY MOTOROLA.

BACKED BY MOTOROLA

A Complete Oil & Gas Solution



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Key Requirements: Value



Cost effective solutions to minimise total cost of ownership

- Leverage existing investments
- Pay only for what you need when you need it
- Minimise operational costs
- Maximise performance
- Ensure availability

Cost Effective Operations



Ensuring The Lowest Cost of Ownership

Leverage existing assets

Integrate with existing systems to protect investment

Lower operating costs

Remote software downloads, elearning, ethernet backhaul, power consumption

Long term performance

Rugged, versatile and fully tested products ensure long term performance

Higher Performance

Receiver sensitivity, higher availability

Support Services

To plan and support you system cost effectively

Pay for what you need

Portfolio of flexible, scalable solutions

Full Support Portfolio



Standard Support Services

- Remote technical support
- Hardware repair and return
- Advance exchange
- Software subscription service
- Territory service manager assistance

Extended Support Services

- Installation & commissioning support
- 24x7 Help Desk & Remote Technical Support
- Terminal support services
- Operations and maintenance services
- Technical training services

Value Added Services

- Performance & optimisation services
- Network management services
- Network security services
- Managed services

A Complete Oil & Gas Solution



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In Summary



Thank you

- Motorola is the leader in TETRA
- A proven solution for oil & gas
 - Flexible and scalable
 - Resilient and secure
 - Supports effective communication & coordination
- Increases safety and efficiency for upstream, midstream and downstream operations





Thank you for your attention