

strategies for growth...

Analyst visit

Ultra Electronics, PMES

25 November 2010



...driving resilience

Visit Agenda

- Arrival and refreshments
- Introduction to PMES
- Tour of facility and product presentations
- Q & A session
- Lunch
- Depart

Introduction to PMES

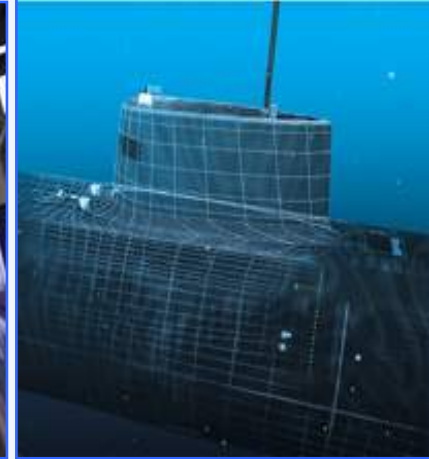
Formed:	1946 as British Electronics Products Ltd 1998 acquired by Ultra Electronics
Revenue:	circa £40m
Growth per annum:	23.5% (2006-2010) organic
Number of Employees:	230
Locations:	Rugeley & Birmingham



Introduction to PMES

CAPABILITIES

- Power systems
 - low voltage power management
 - high integrity power supplies
 - power-dense motors and drives
 - gas turbine start systems
 - aircraft ground services
 - reactor control and instrumentation
- Signature management systems
 - degaussing systems
 - on-board signature management
 - multi influence ranges
- Specialist sensor products
 - multi influence underwater
 - heading reference
 - electric field
- Transit power systems
 - transformer rectifier units
 - modular sub-stations



Power Systems

EQUIPMENT & SYSTEMS ON ASTUTE



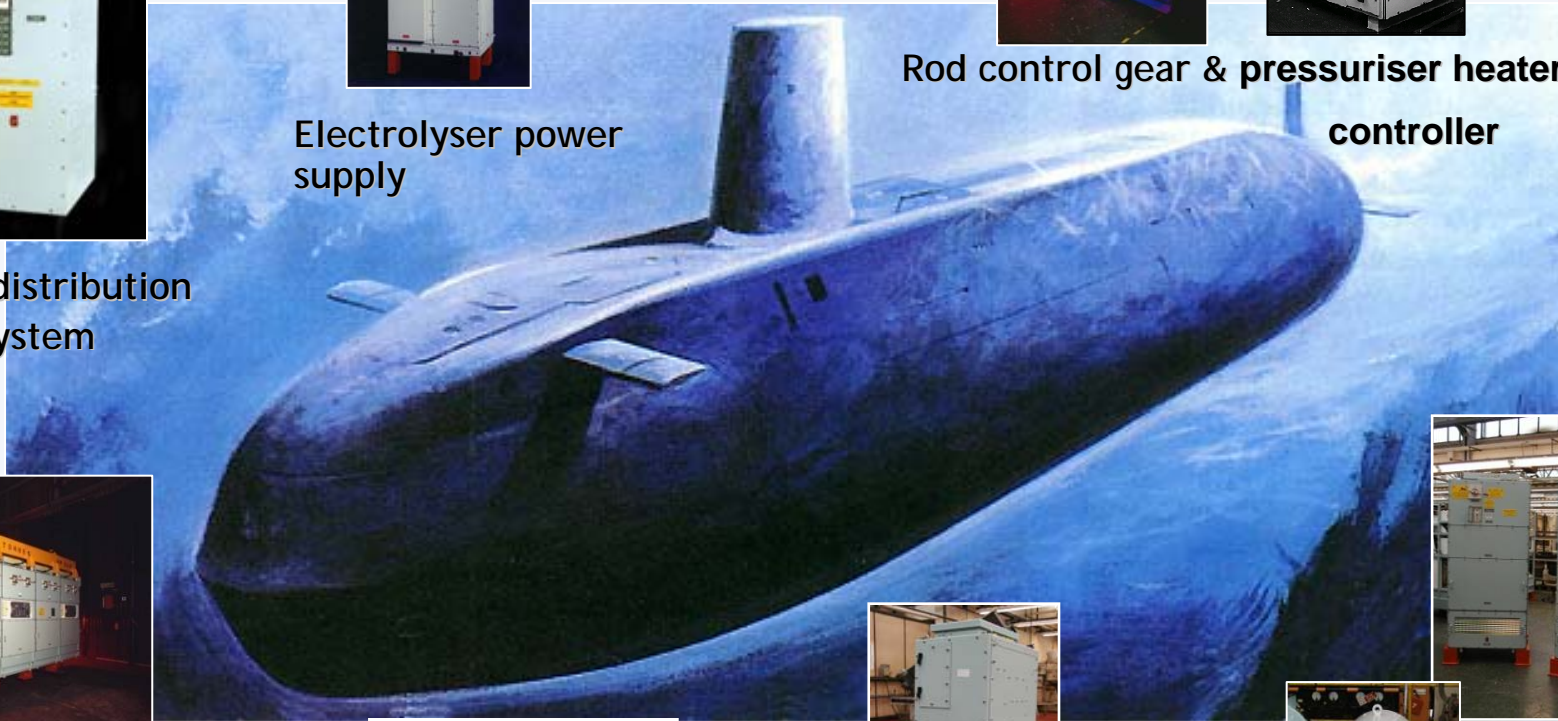
400Hz distribution system



Electrolyser power supply



Rod control gear & pressuriser heater controller



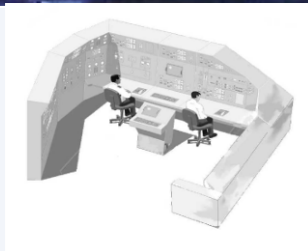
Main static converter



Lubricating oil pump power supply



Emergency propulsion system



Control consoles

Markets, Customers & Competitors

Markets

Customers

Competitors

Power systems

BAES
Rolls-Royce
MoD

Converteam
Northrop Grumman
Hamilton Sundstrand

Signature management

BAES
Arm Scor (SA)
Royal Netherlands Navy
Royal Australian Navy

Atlas
L3
PolyAmp

Transit power systems

Network Rail
Balfour Beatty
EDF
Thales Transport

ABB
T & R
Balfour Beatty

What makes PMES different?

RANGE OF COMPACT, HIGH INTEGRITY CONTROL EQUIPMENT

- Rod control gear
 - control of nuclear reactor control rods
 - the 'reactor throttle'
- Main static converter
 - provides 3 phase power for Astute submarines
 - acts as uninterruptable power supply for all essential services
- Control consoles
 - control & instrumentation
 - platform management
 - the 'submarine dashboard'



Main static converter



Astute central console



Rod control gear

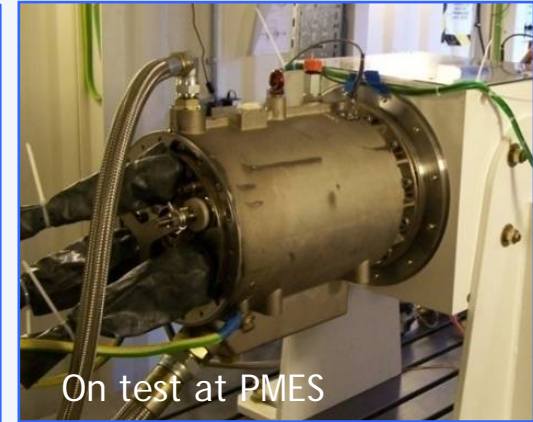
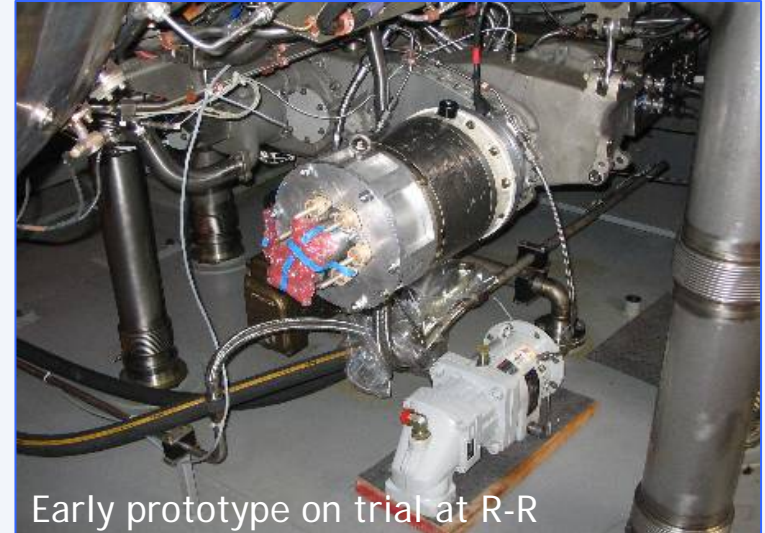


Pressuriser heater control

What makes PMES different?

POWER-DENSE ELECTRIC MOTORS

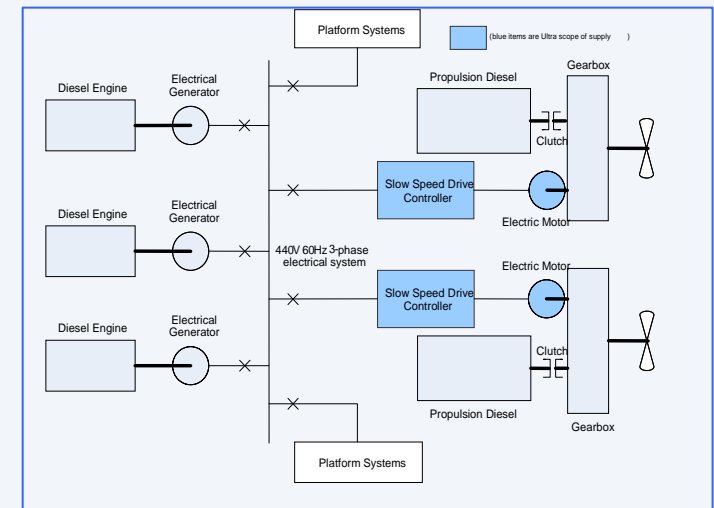
- Gas turbine electric start system
 - replaces less reliable pneumatic/hydraulic starters
 - production contract for R-R Canada underway
 - integrated liquid cooling for compactness
 - high-torque/high speed (typically 15,000 rpm)
 - reduced footprint & weight



What makes PMES different?

POWER-DENSE ELECTRIC MOTORS

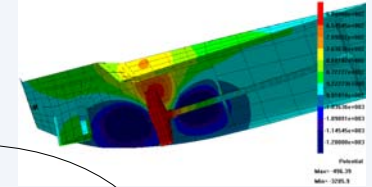
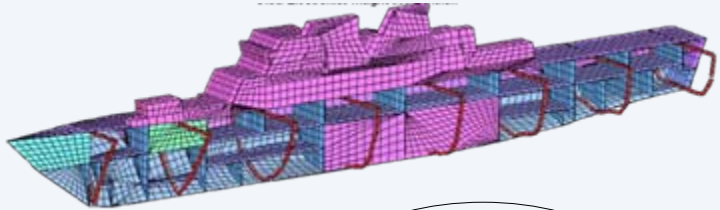
- Hybrid electric propulsion
 - for slow-speed manoeuvre & cruise
 - cost savings through reduced main-engine usage & fuel consumption
 - significant weight/space advantages compared to air-cooled motors
 - easy to integrate with main-engine gearbox
 - power-regeneration capability
- Electric cruise propulsion
 - phase 1 study for 'Successor' completed
 - next generation 'deterrent' submarine
 - phase 2 motor capability demonstration in early 2012



Typical size comparison

What makes PMES different?

SIGNATURE MANAGEMENT SYSTEMS



Degaussing coil design

Degaussing systems

Corrosion protection

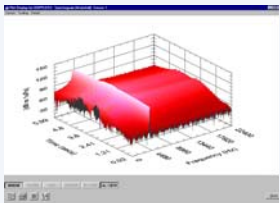
SIGNATURE MANAGEMENT EXPERTISE



Signature management database

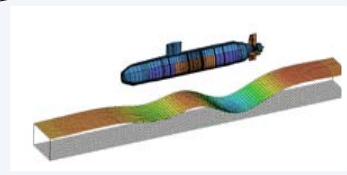
Magnetic treatment facilities

Signature measurement ranges



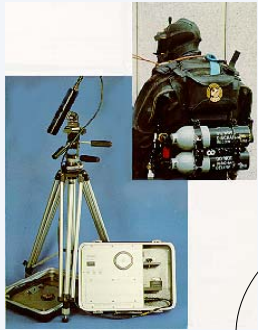
Search Signatures Database

Run ID	Date of Run	Time of Run	Visual Name	Class (Select)	Class Type	IM sample rate	AM sample rate	Actual Block Rate



What makes PMES different?

SPECIALISED SENSORS



Instrumentation



Electric field sensors



3-axis electric field sensors



Heading reference magnetometers

HIGH PERFORMANCE SENSORS



Multi-influence sensors

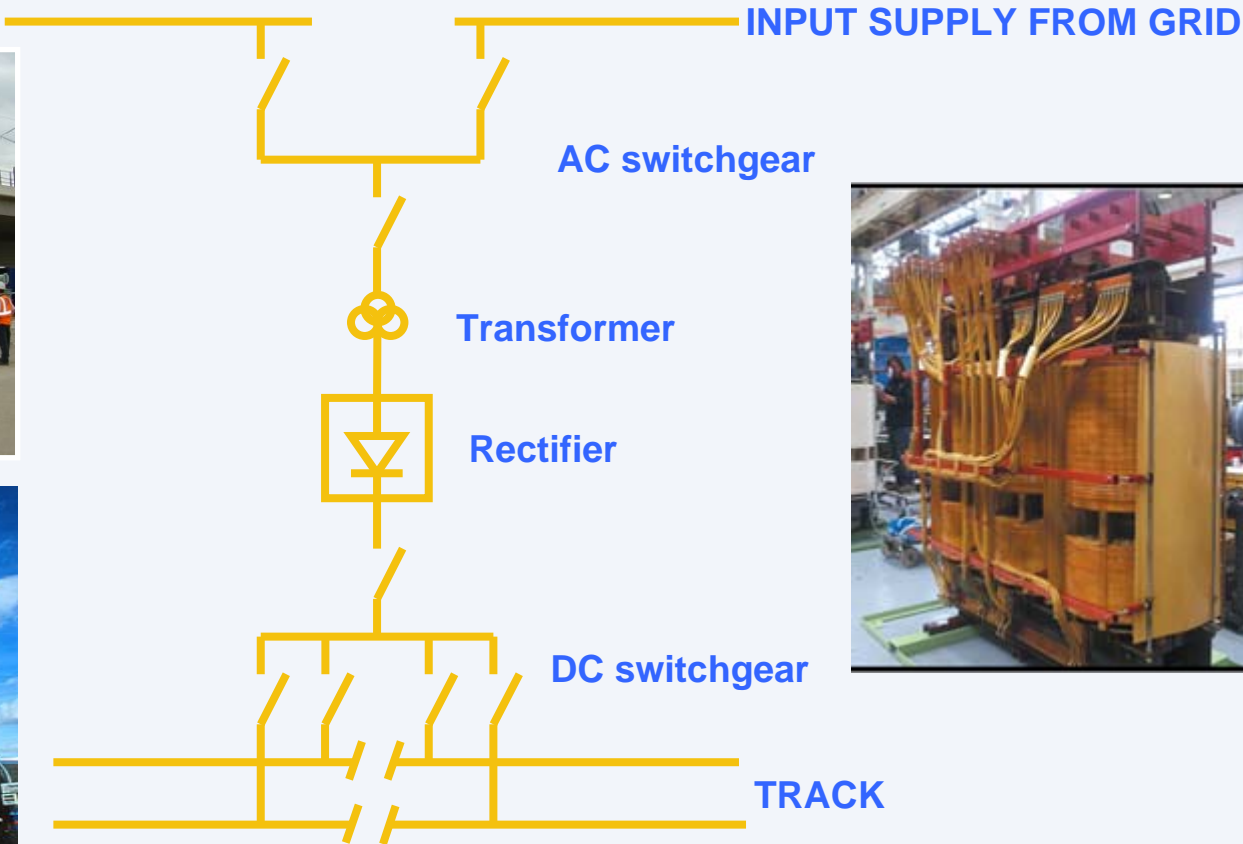


Underwater magnetic sensors



What makes PMES different?

TRANSIT POWER SYSTEMS



Future Growth Drivers

NAVAL SYSTEMS

- Vanguard class refit
- Astute class (boats 5-7)
- Reactor control upgrade to all RN submarines
- Successor class
- Gas turbine electric start systems
- Australian submarines and surface ships
- Type 26



Future Growth Drivers

TRANSIT SYSTEMS

- Network Rail
- London Underground
- Manchester Metrolink
- Bombardier for Nottingham Tram
- Mass transit systems e.g. Australia, UAE & Hong Kong



Appendix

SDSR Output

Position of each programme in a column indicates the broad impact on UK defence industry. The font colour (red, amber, green) indicates the impact on Ultra. Black font indicates no impact

Positive	Ambiguous	Negative
A400M	F-35 JSF	Type 45
Carriers	Successor	Nimrod MRA4 (but mitigated)
Astute	FSTA	Harrier
Rivet Joint	Lynx/Wildcat helo	Challenger
Scout	Warrior	AS90 artillery
	Tornado	Defence Training Review
	Chinook	Naval fleet

- Process delays and dislocation
 - significant headcount reduction required
- Opportunities for tier 2 upgrades
 - fewer new platforms
 - increased prospecting in Main Building needed

strategies for growth...

Ultra
ELECTRONICS



...driving resilience