

Joint Service Power Expo
USMC Expeditionary Power Systems



Michael Gallagher
Program Manager – Expeditionary Power Systems
Marine Corps Systems Command
May 2009

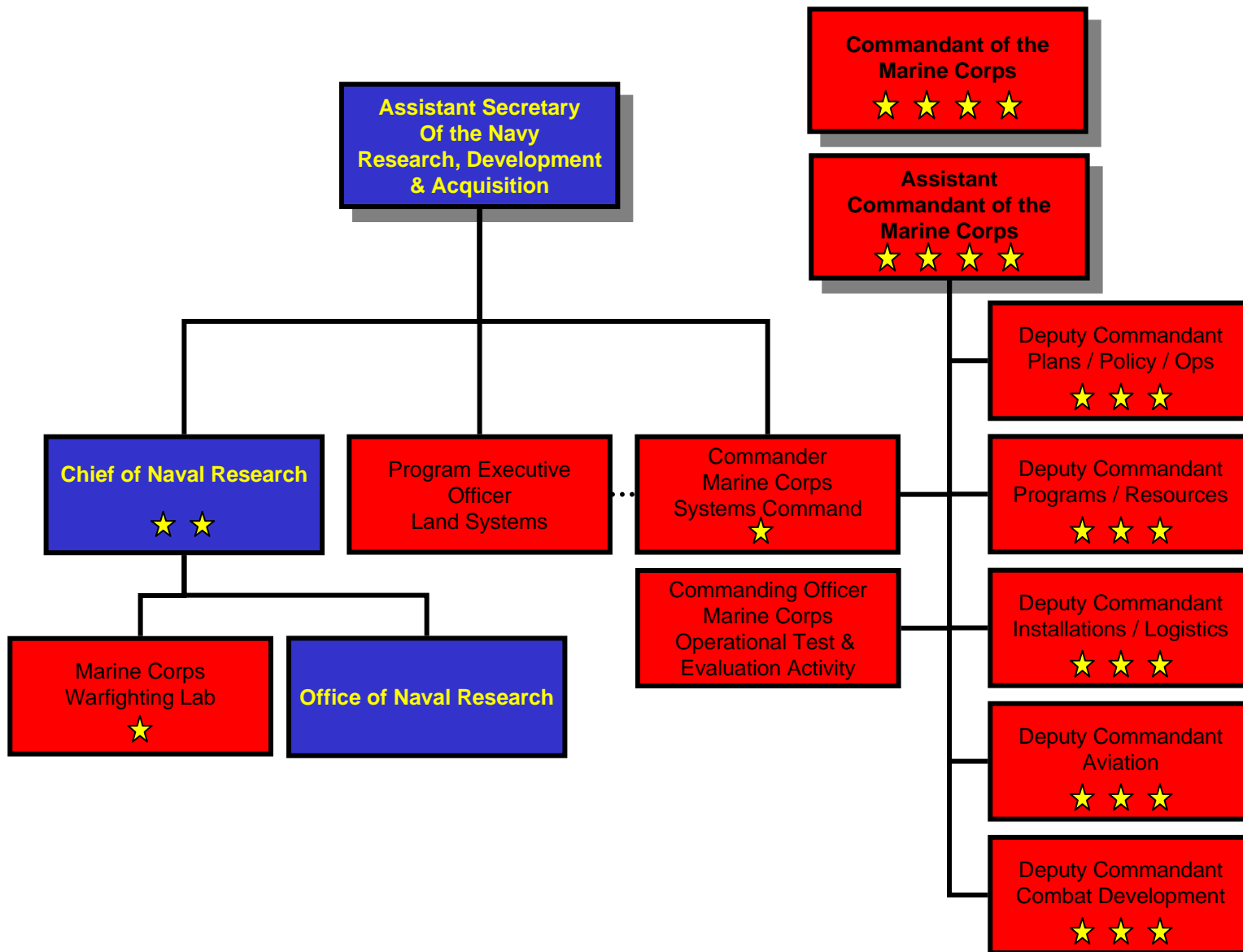


Briefing Topics

- **Who we are**
- **Where we've been**
- **Where we're going**
- **What we know**
- **Some things to think about**

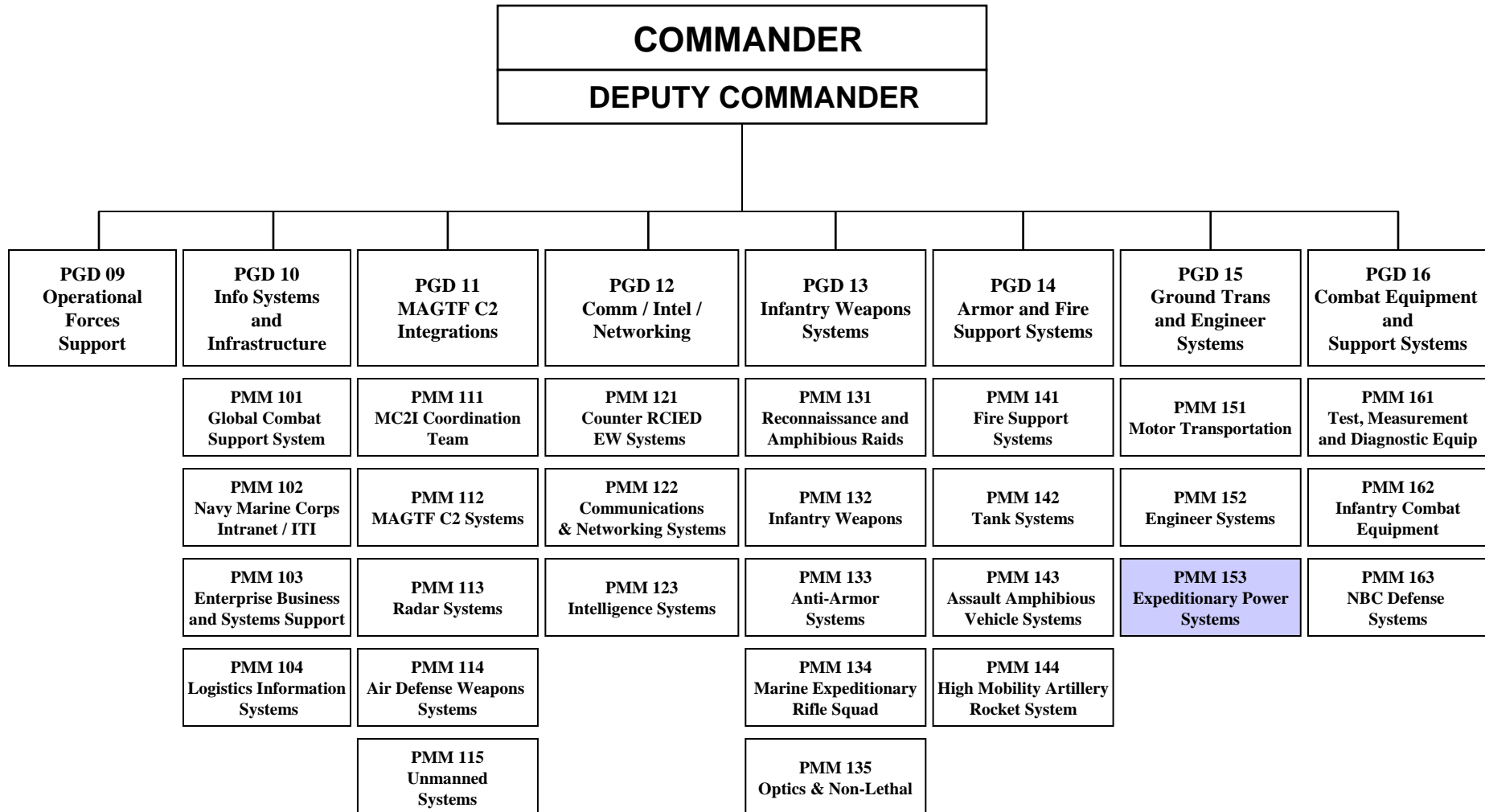


USMC Organizations involved in Research and Acquisition



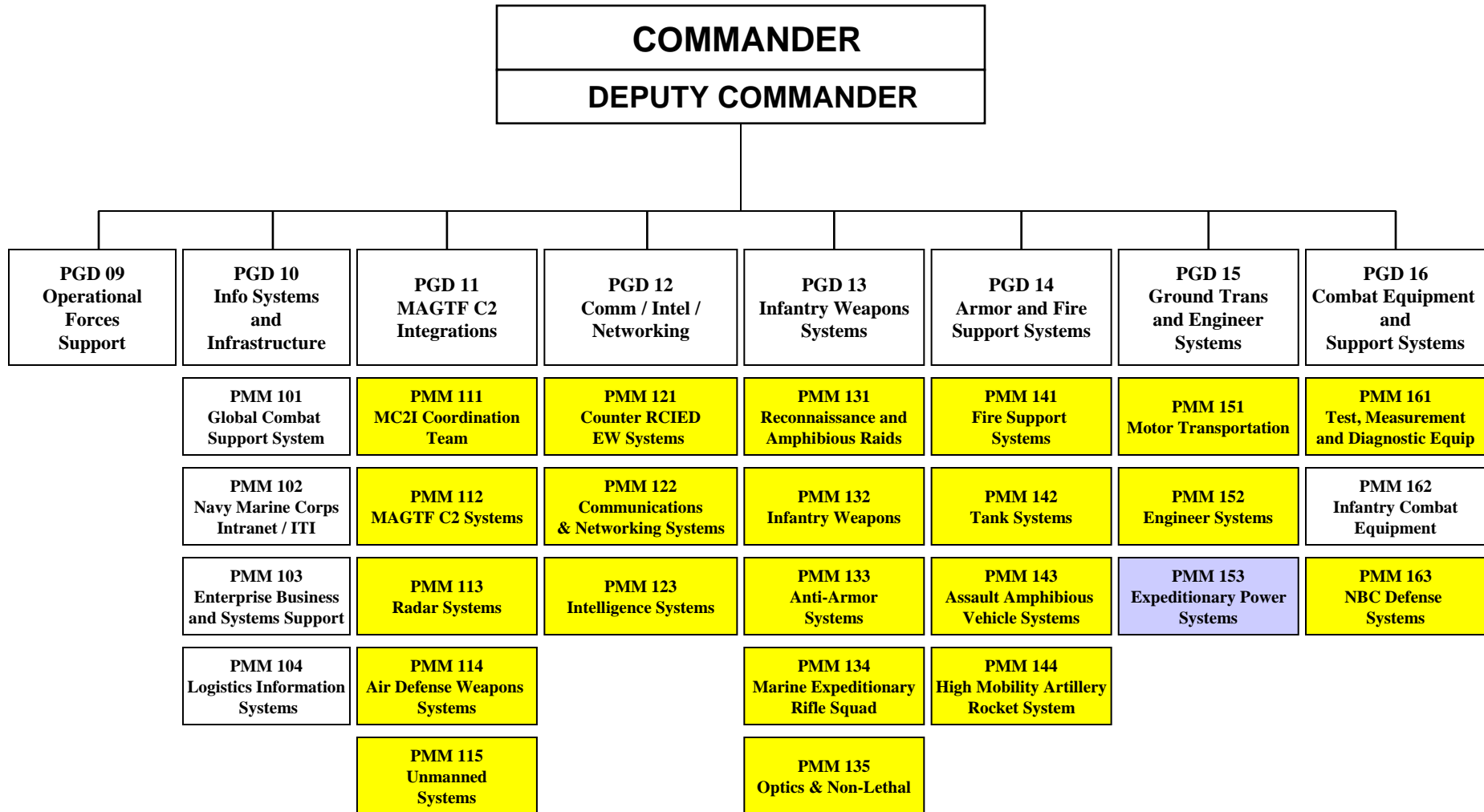


Marine Corps Systems Command





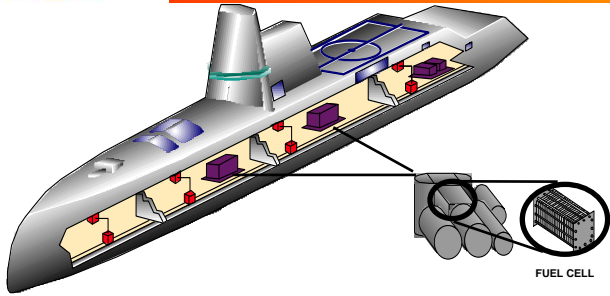
Marine Corps Systems Command



PEO Land Systems: EFV G/ATOR MTRV LVSR LW 155 CAC2S PM LAV



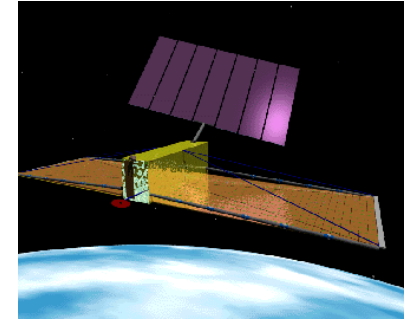
Power ...*Pervasive & Enabling*



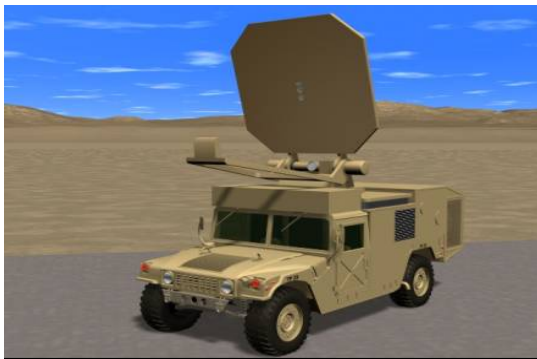
Electric Warship



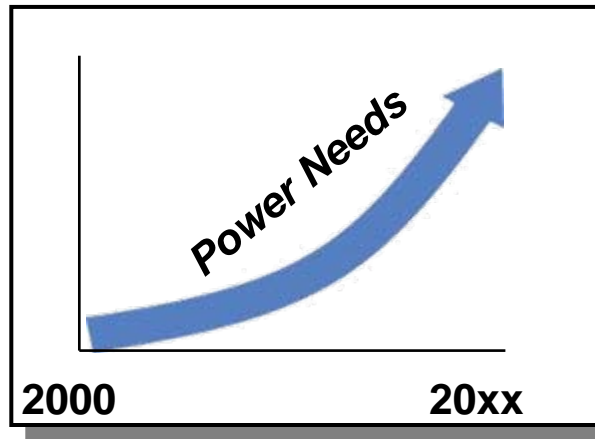
More Electric Aircraft



Space Systems



Less-than-Lethal Systems



Warfighter



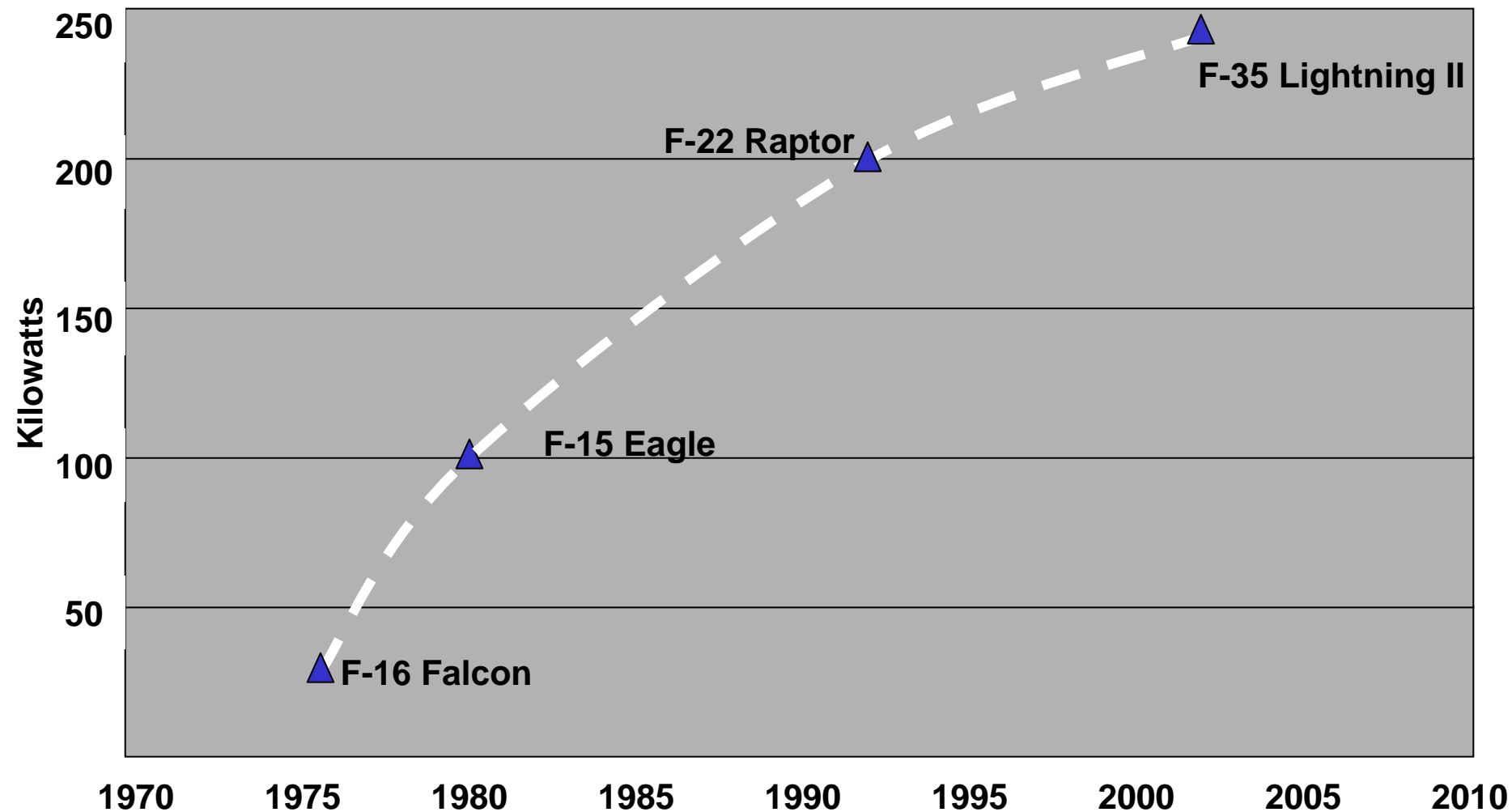
Combat Vehicles & Weapons



Tactical Vehicles & Support Systems



Alternator Rating on USAF Fighter Aircraft

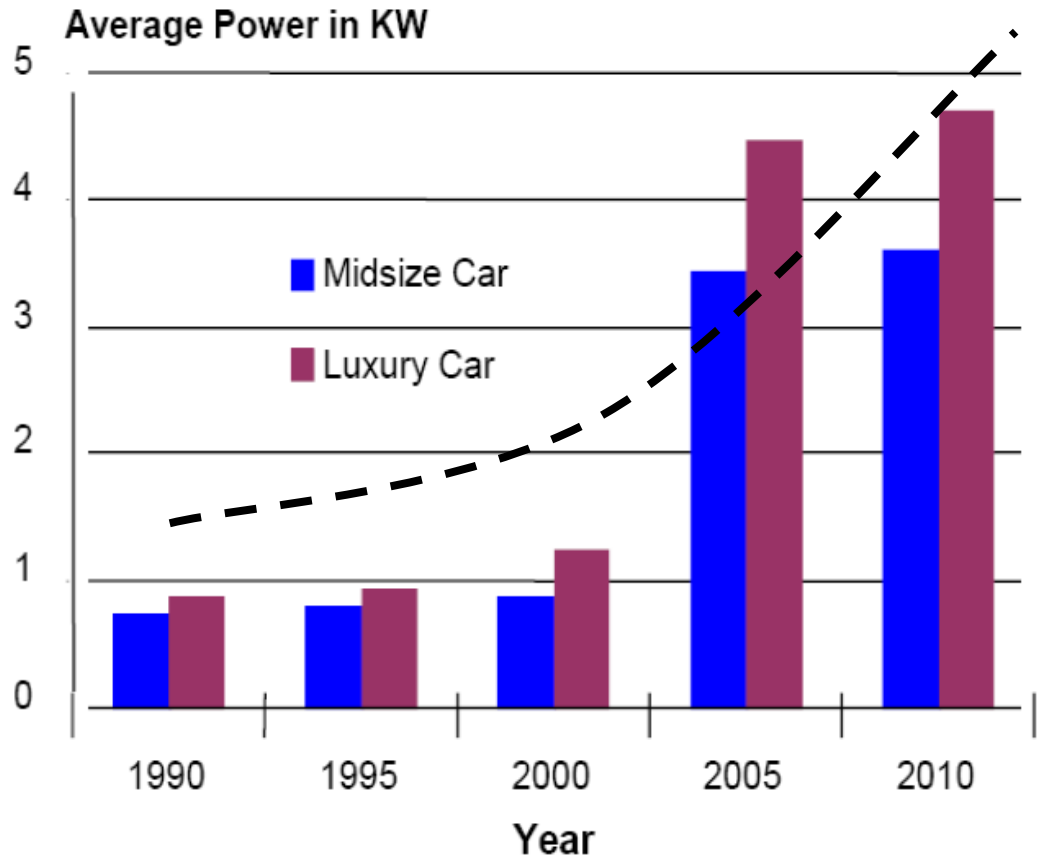




U.S. Department of Energy
Energy Efficiency and Renewable Energy
Bringing you a prosperous future where energy is clean, abundant, reliable, and affordable

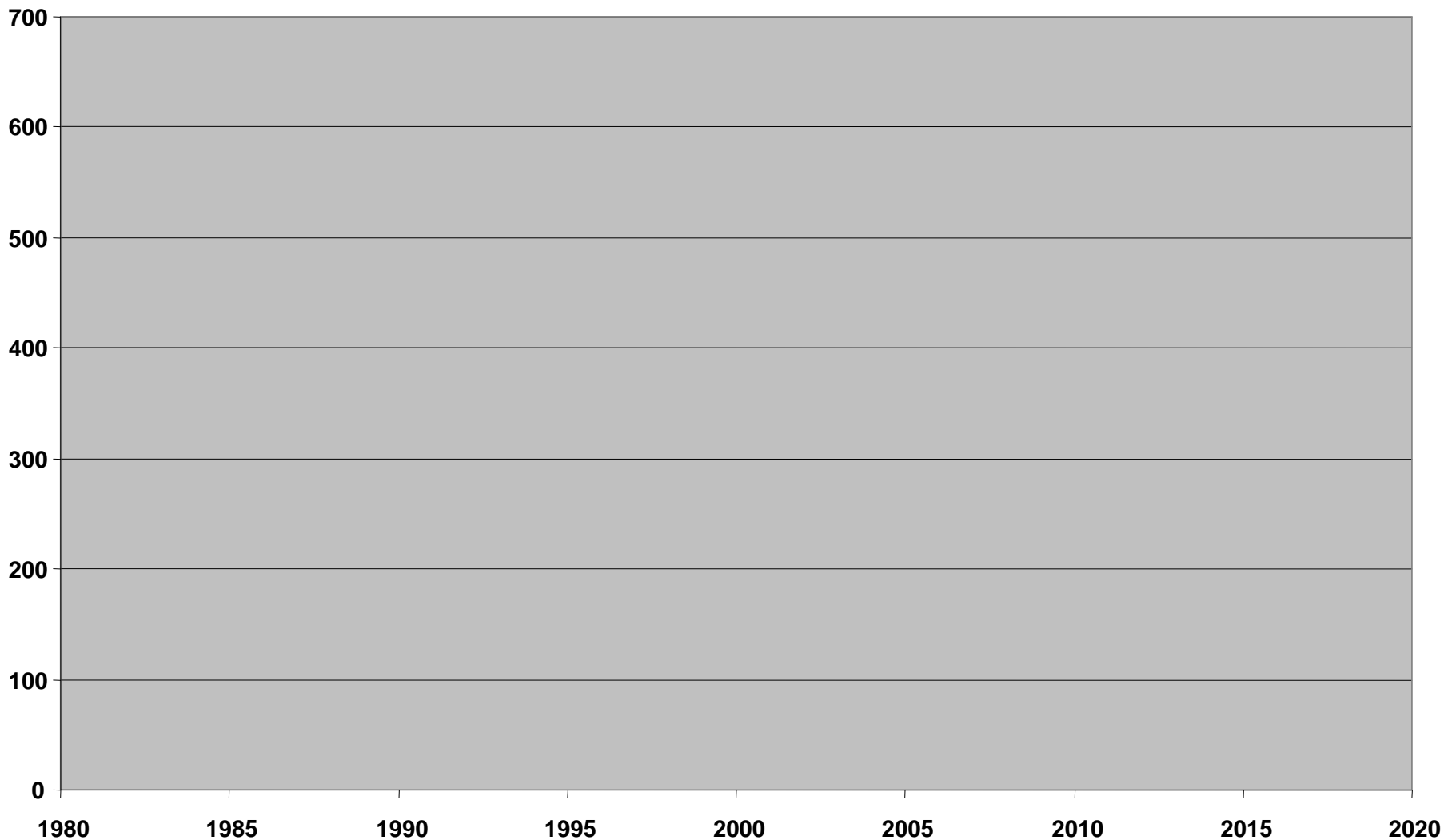
Increasing Electrical Power Requirements for Vehicles

- Stability controls
- Telematics
- Collision avoidance systems
- Onstar Communication systems
- Navigation systems
- Steer by-wire
- Electronic braking
- Powertrain/body controllers & Sensors



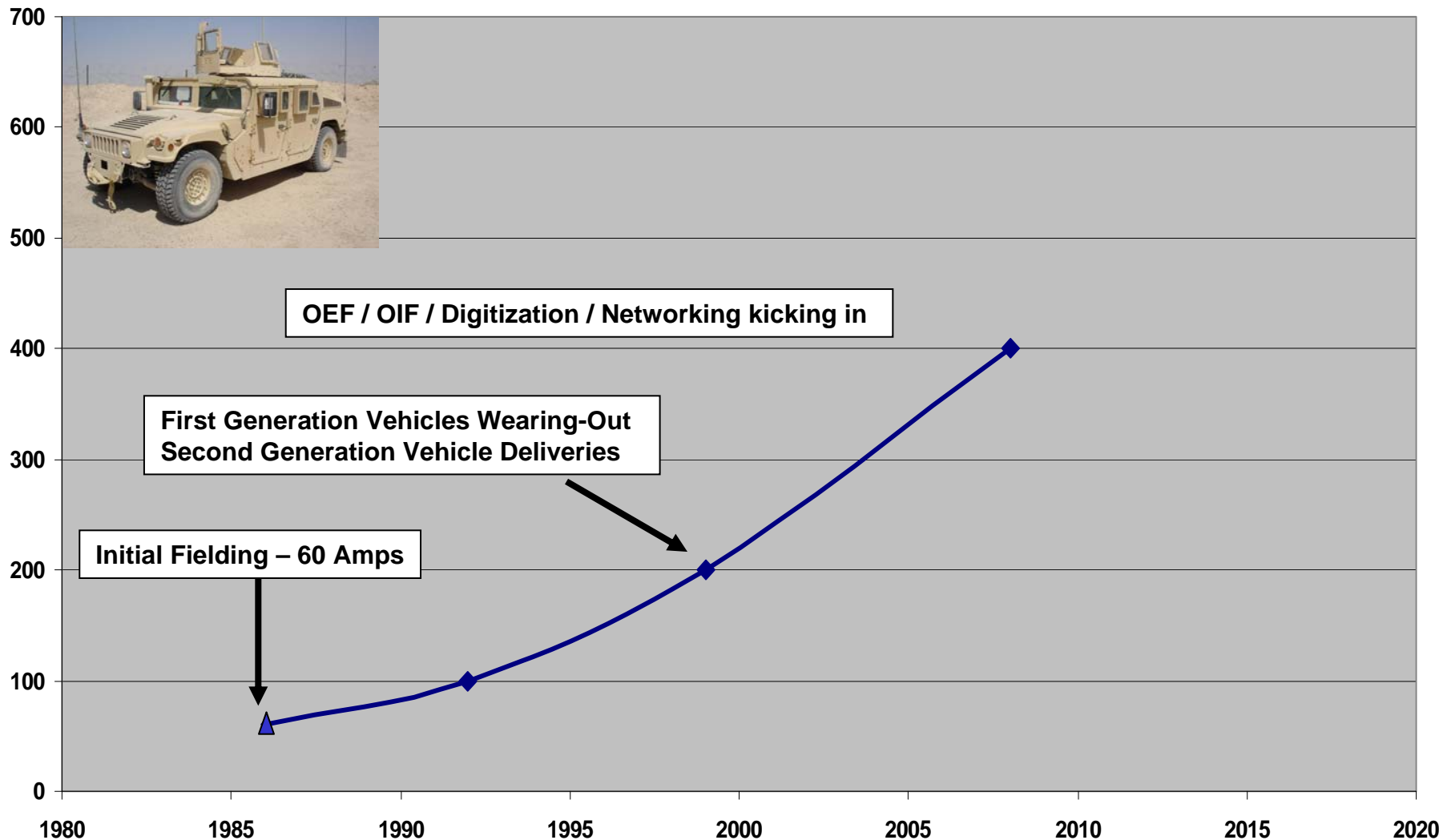


Alternator Amperage Rating on HMMWV / MRAP at 28 VDC



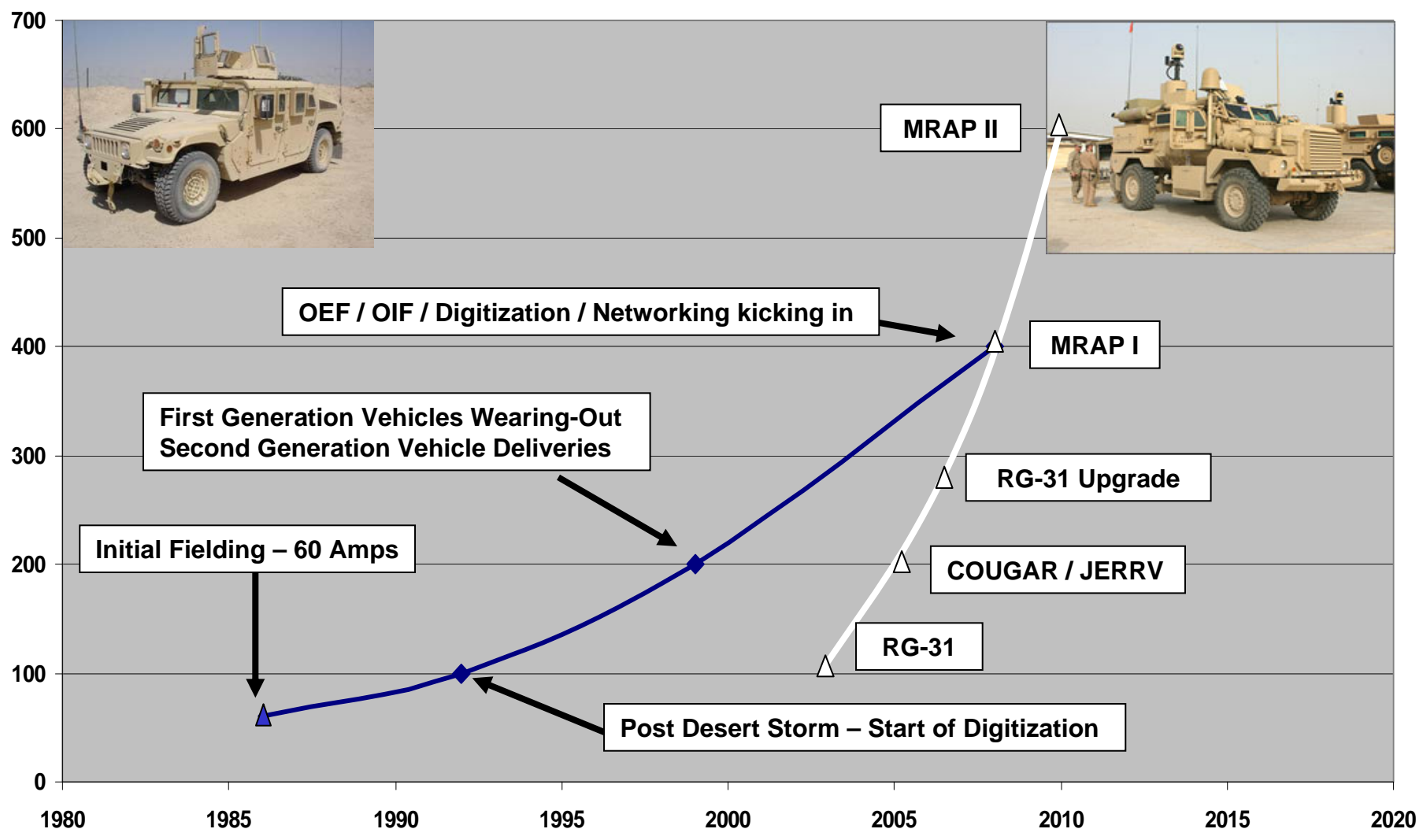


Alternator Amperage Rating on HMMWV / MRAP at 28 VDC



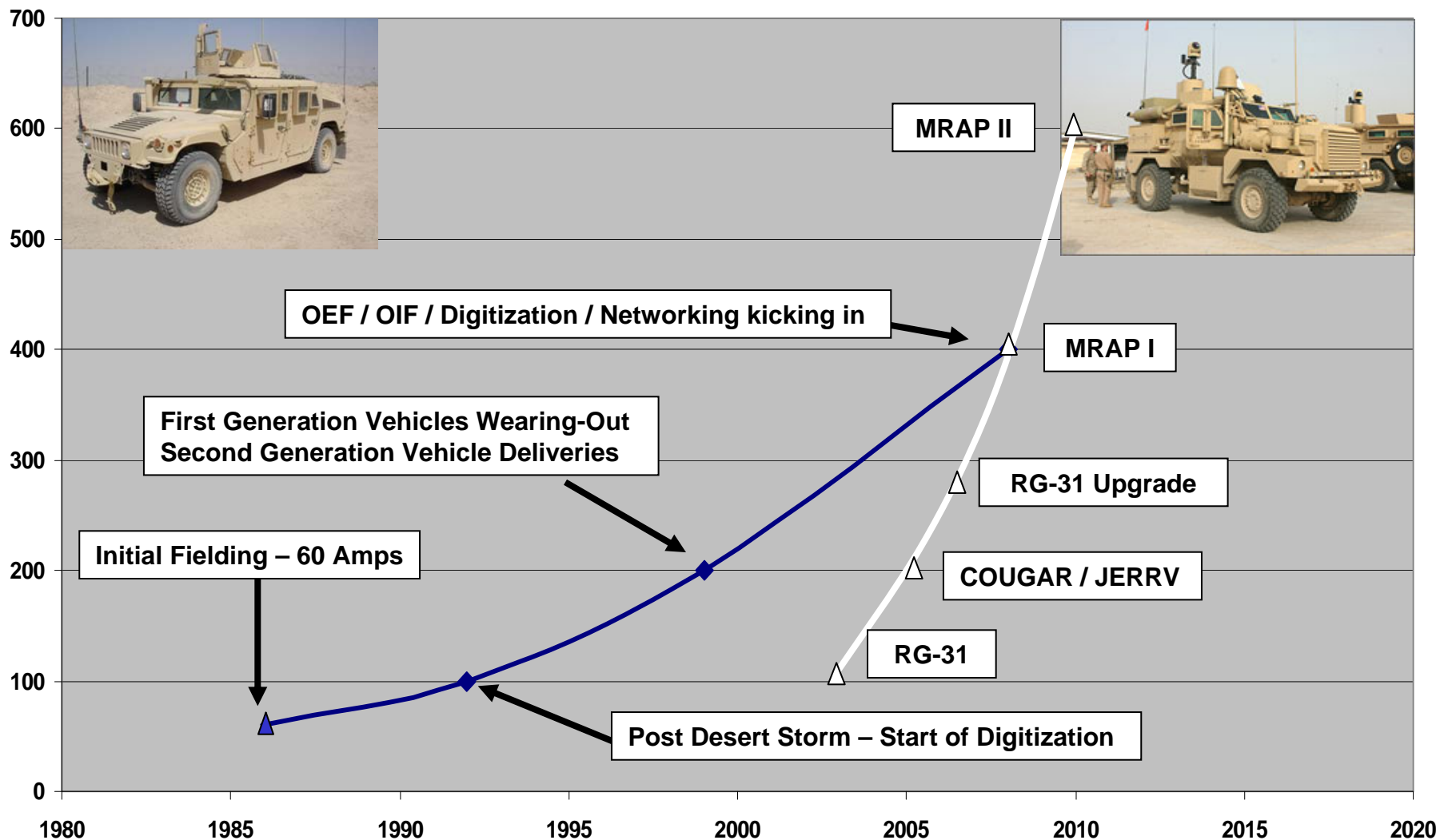


Alternator Amperage Rating on HMMWV / MRAP at 28 VDC



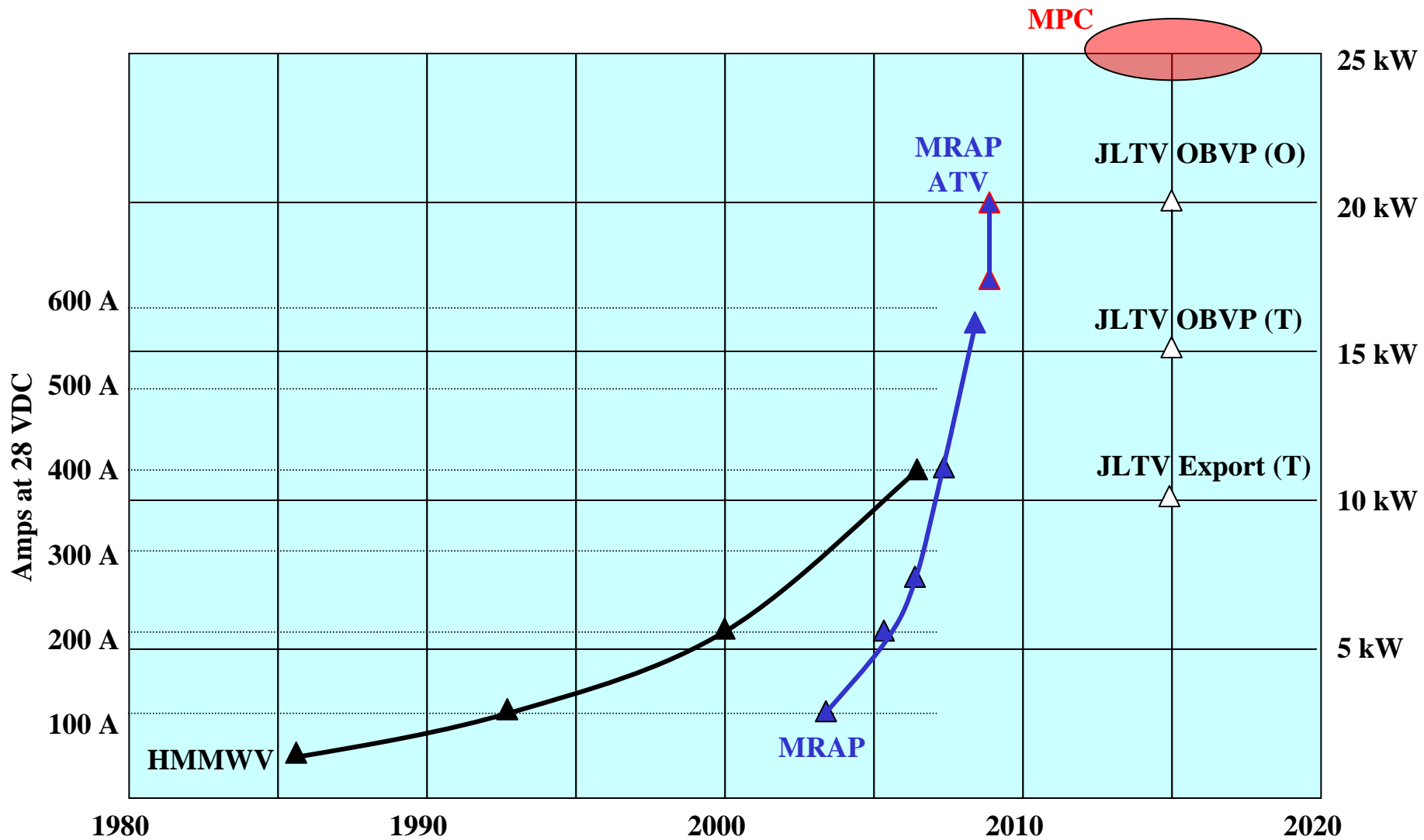


Alternator Amperage Rating on HMMWV / MRAP at 28 VDC





Tactical Vehicle Electric Power





What's Consuming Power?





USMC JOLLER C-IED Experiment

MTVR Platform: \$135,000

60 kW Tactical Generator: \$40,000

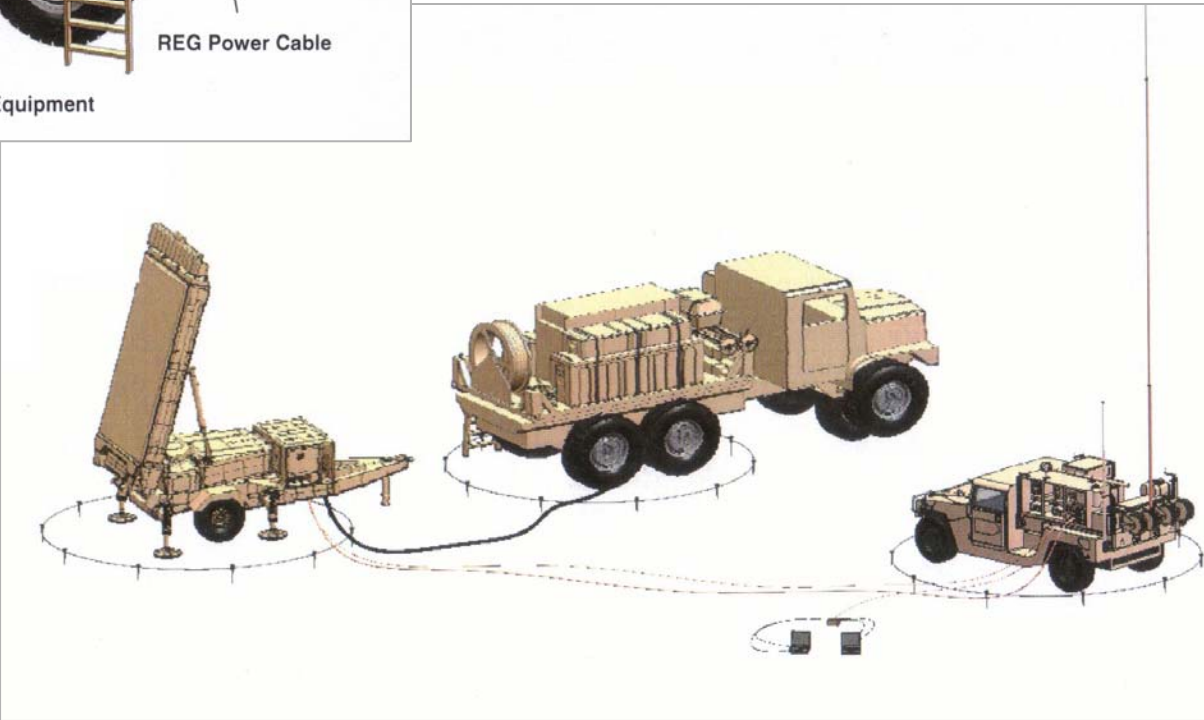
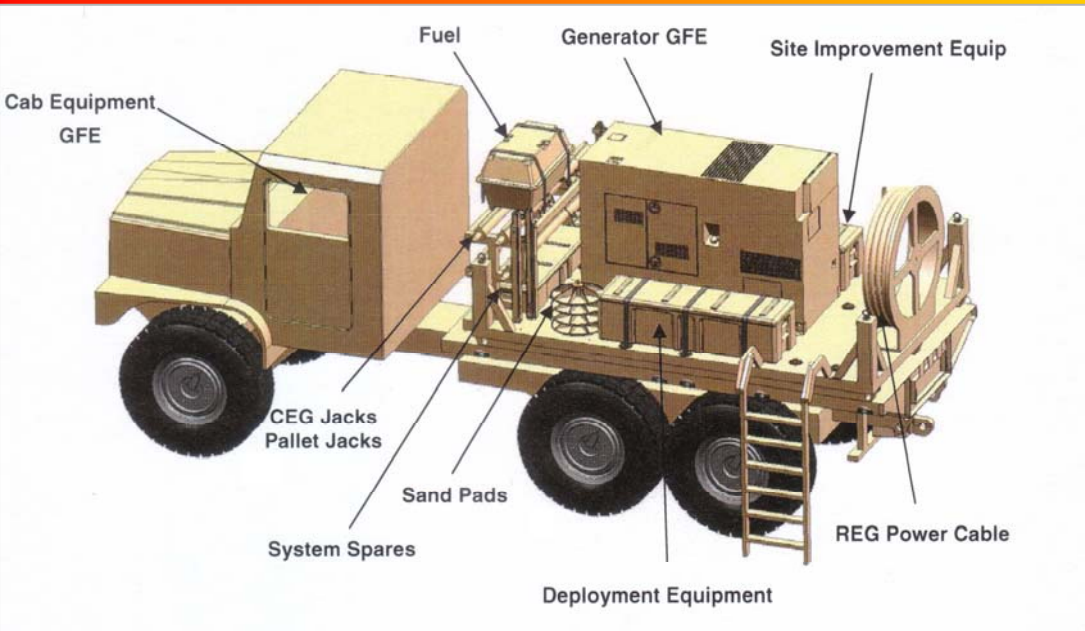


Lightening Bolt: PRICELE\$\$

Mine Rollers: \$85,000



Current power plan for USMC MTRV and G/ATOR Radar





“Every Marine is a Rifleman”





“Every Marine is a Radio Operator”

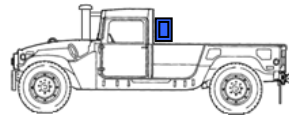
Operations in Afghanistan, August 2008





Pre-OIF Rifle Company Radios

Co HQ (x3/Bn)



Mounted in M998A1

T/O 6 Officer/176 Enlisted	
	VHF-V (VRC-88): 1
	VHF-M (PRC-119): 7
	UHF-M (PRC-113): 1

RFL Plt (x3/Co x9/Bn)



Radio Weights	
	PRC-119 - 22.5 lbs
	PRC-113 - 16.7 lbs
	* w/batteries

WPNS Plt (x3/Bn)



MG Sect

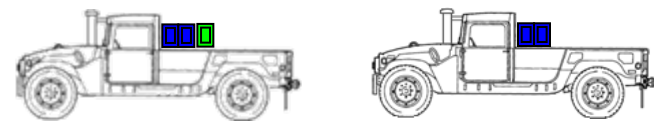
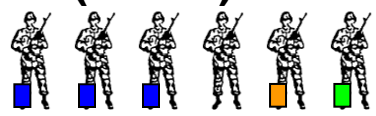
Mortar Sect

Assault Sect



OEF-Era Rifle Company Radios

Co HQ (x3/Bn)

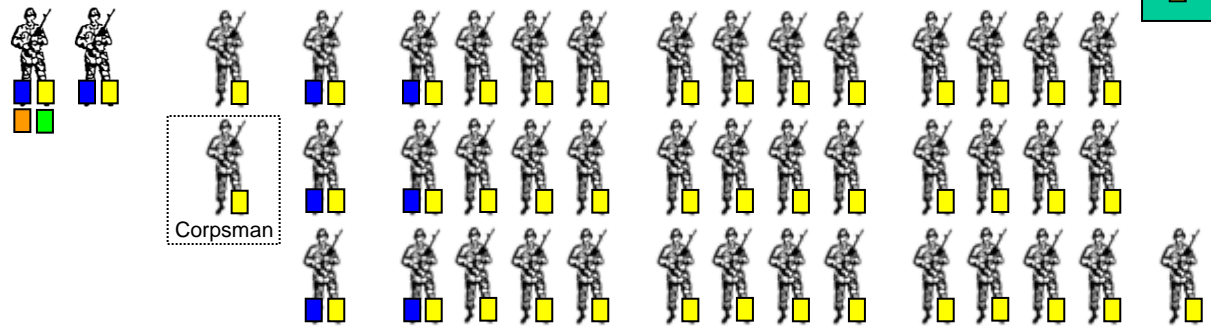


Mounted in M1123A2s

T/O 6 Officer/176 Enlisted	
	MBR-V (VRC-103): 1
	MBR-M (PRC-117): 6
	HFMR (PRC-150): 5
	DVA (VRC-110): 2
	THHR (PRC-148/152): 35
	IISR (PRC-153): 176

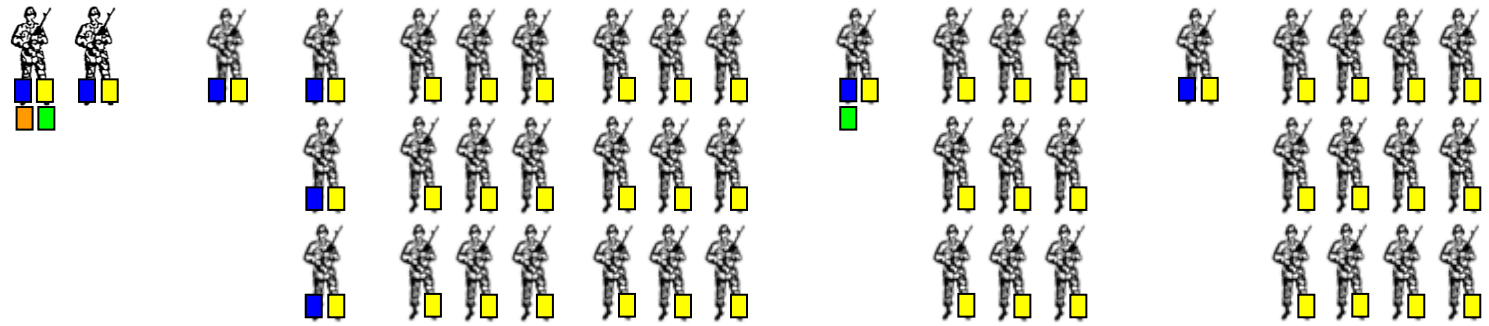
*Corpsman IISR counted in H&S

RFL Plt (x3/Co x9/Bn)



<u>Radio Weights</u>	
PRC-150	- 15.7 lbs
PRC-117	- 15.9 lbs
PRC-152	- 2.4 lbs
PRC-153	- 1 lbs
* w/batteries	

WPNS Plt (x3/Bn)



MG Sect

Mortar Sect

Assault Sect



What's Unique about USMC Acquisition

“DOESN'T THE USMC JUST BUY ARMY STUFF?”

1947 National Security Act

- Provide Fleet Marine Forces with combined arms and supporting air components for service with the United States Fleet in the seizures or defense of advanced naval bases and for the conduct of such land operations as may be essential to the execution of a Naval campaign.
- Develop, in coordination with the Army, Navy and Air Force, the doctrine, tactics, techniques, and equipment employed by landing forces in amphibious operations.
- Develop in coordination with the Army, Navy and Air Force the doctrine , procedures and equipment for airborne operations.

Bottom Line: USMC does procure unique equipment for its unique missions



OBJ

FBHL

FBHL

WHAT WE DO TODAY

OBJ

WHAT WE WILL DO TOMORROW





Implications to Power & Energy

- **Space and Weight are at a premium due to lift restrictions**
 - Air
 - Sea
- **Efficiency and adaptability of energy use for deployed forces**
- **Unique transportation requirements**
 - All equipment must be capable of deploying via ship or air
 - Equipment must survive coming through surf
 - Electromagnetic interference from shipboard systems
 - Special restrictions for shipboard stowage / transport
 - Supply / resupply is from the mother-ship / Pre-Positioned Forces



Mobile Electric Power

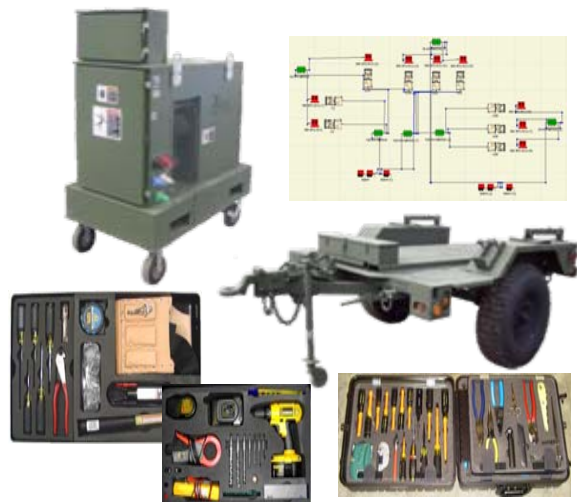
DOD Standard Generators



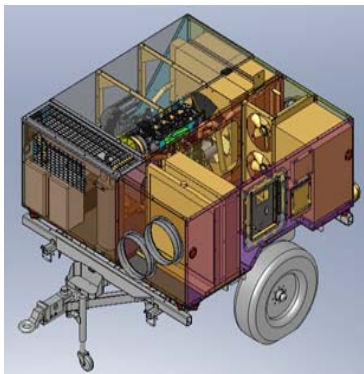
USMC Unique Generators



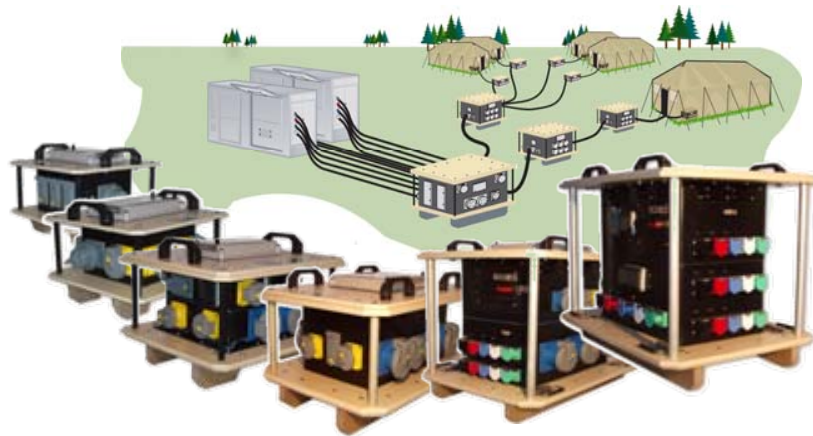
Tools / Customer Support



Integrated Trailer ECU - Generator



Power Distribution



Floodlight Sets





Advanced Power Sources

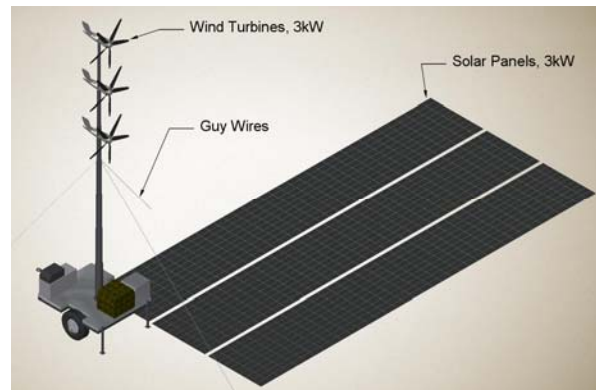
Radio Power Adaptors



Power Supplies



Renewable Energy



On-Board Power



Battery Management / Sustainment Systems

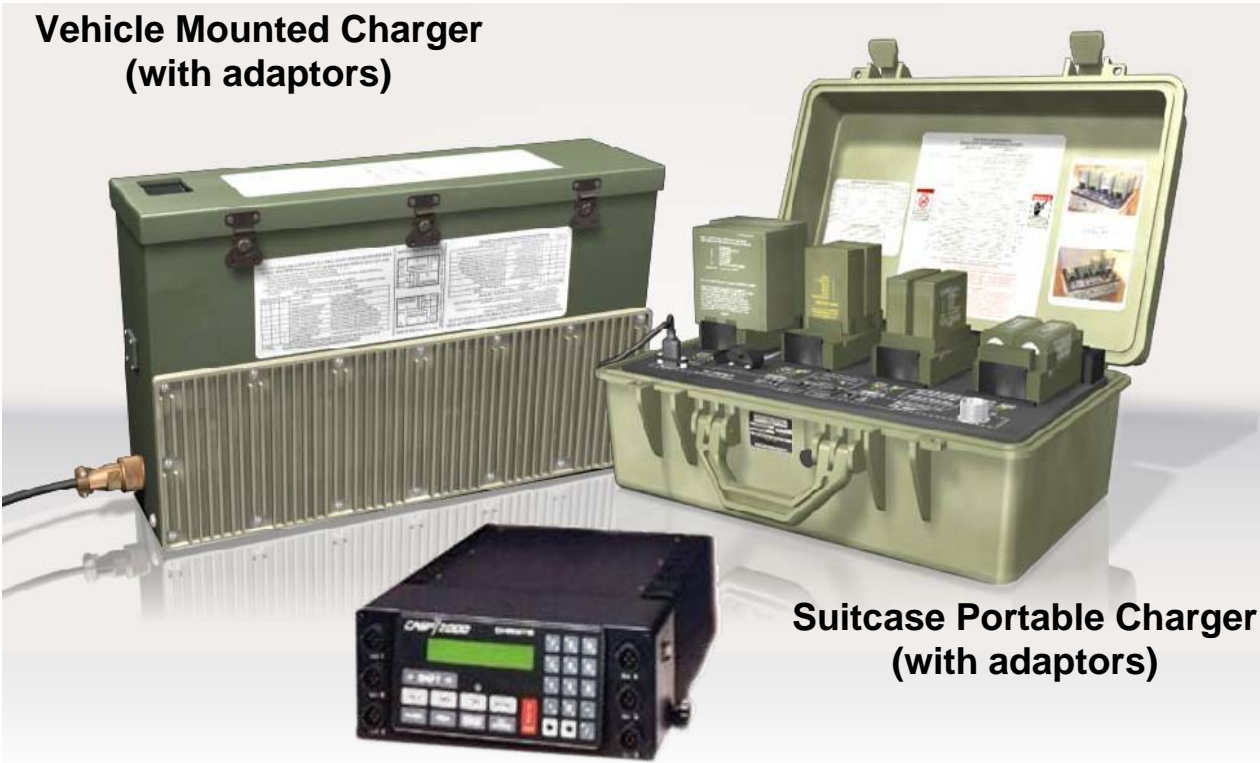




Battery Management & Sustainment

Battery Chargers (Comm-Elec)

Vehicle Mounted Charger
(with adaptors)



Suitcase Portable Charger
(with adaptors)

CHRISTIE Charger

Battery Chargers / Tools (Ground Equipment)



Computer Based Training



Naval Lithium Battery Safety Program

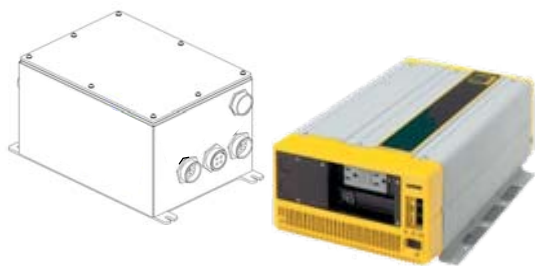


Military
Batteries

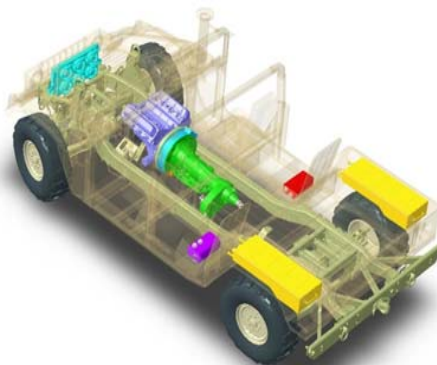


USMC On-Board Vehicle Power

DC-AC Power Inverters
1.8 / 2.5 kW



OBVP - Medium
20-30 kW HMMWV



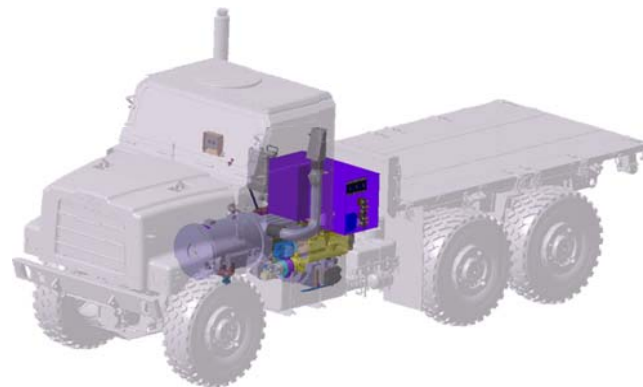
Auxiliary Power Units



OBVP - Small
400 Amps @ 28 VDC (HMMWV)



OBVP - Large
120 kW (MTVR)





Renewable Energy Systems

Internal
< 10 W



Carried
10 - 100 W



Portable
100 - 1000 W



Generator
1 - 10 kW



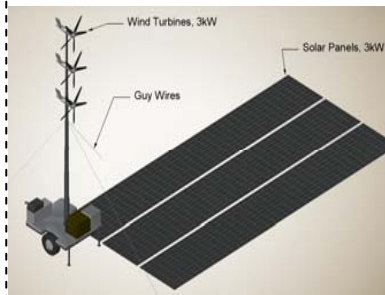
Stationary
> 10 kW



SPACES
Project



GREEN
Project



DREAM
Project





Advanced Planning to Industry

Future Program Initiatives

- **Renewable Energy Systems – Man-portable (2009)**
- **On-Board Vehicle Power (2009)**
- **Advanced Battery Technology (2010)**
- **Family of Battery Chargers (2011)**
 - **Vehicle Mounted Battery Charger (now)**
- **Family of Radio Power Adaptors Reset (2011)**
- **Family of Power Supplies (2012)**
- **Family of Environmental Control Units (2013)**
- **Field Refrigeration Systems (2013)**
- **Mobile Electric Power Distribution (2013)**
- **Floodlight Set Rebuy (2013)**



USMC Power Considerations

- **Acquisition in accordance with Department of Defense policies for requirements validation / acquisition management / DOD MEPGS**
- **USMC has unique requirements over and above other services**
- **Many of the power solutions are adapted from commercial sector, but ruggedized for the military environment**
- **Equipment requirements continue to grow, but manpower to support has not kept up.**
- **Troop rotation is perpetual. Training/retraining is paramount. Ease of equipment use vitally important.**



Closing Comments USMC Acquisition

- **We compete 99% of our programs**
 - For programs that may go sole-source to a vendor, most likely they were competed in the initial phase
- **Market research dictates whether programs are small business set aside, or Full and Open competition**
 - Don't ignore Sources Sought Notices or Requests for Information
- **If we see that an item is commercially available, we will request / require a loaned article as part of proposal submission to support our source selection**
- **Order of precedence when we procure:**
 - Federally mandated suppliers (Lighthouse for the Blind, Federal Prisons)
 - Federal Supply Schedule
 - Small / disadvantaged businesses
 - Small business
 - Open sources
 - Limited sources
- **For all solicitations and notices, keep an eye on FEDBIZOPPS**



Questions

