V-22 Osprey Tiltrotor

Game Changer

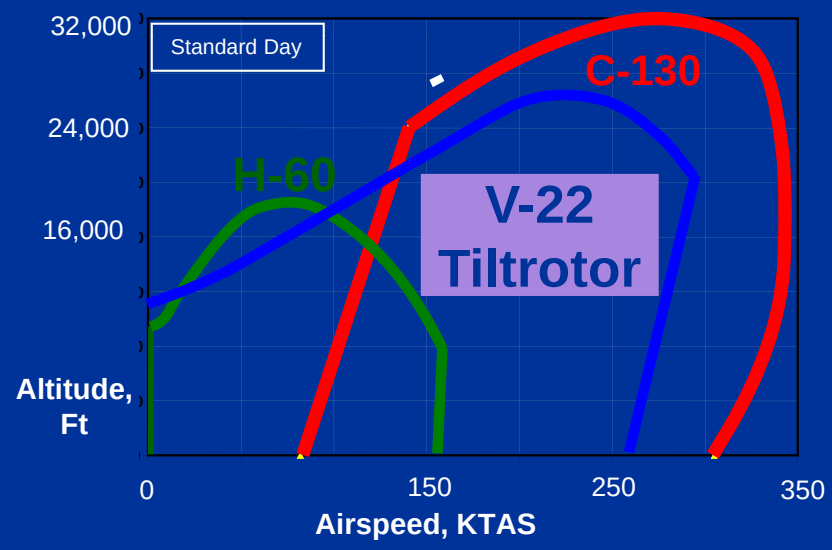
Program Overview, Naval Air Systems Command (PMA-275)

August 2010

Approved for Public Release

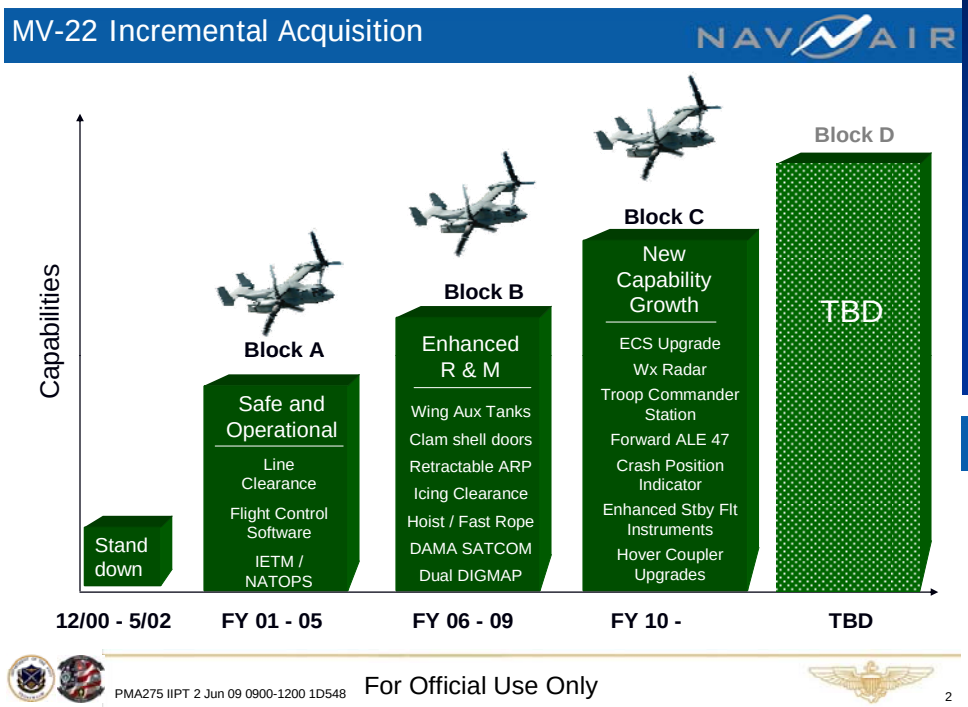
V-22 Performance

- Tiltrotor Design
- V/STOL
- Maximum Cruise 262 Kts
- Mission Radius 350 nm
- Service Ceiling 25,000 ft
- Normal Altitude w/Pax 10,000 ft
- Ferry Range 2,660 NM w/1 refuel
- One Engine Out Capable
- Amphibious Shipboard Capable

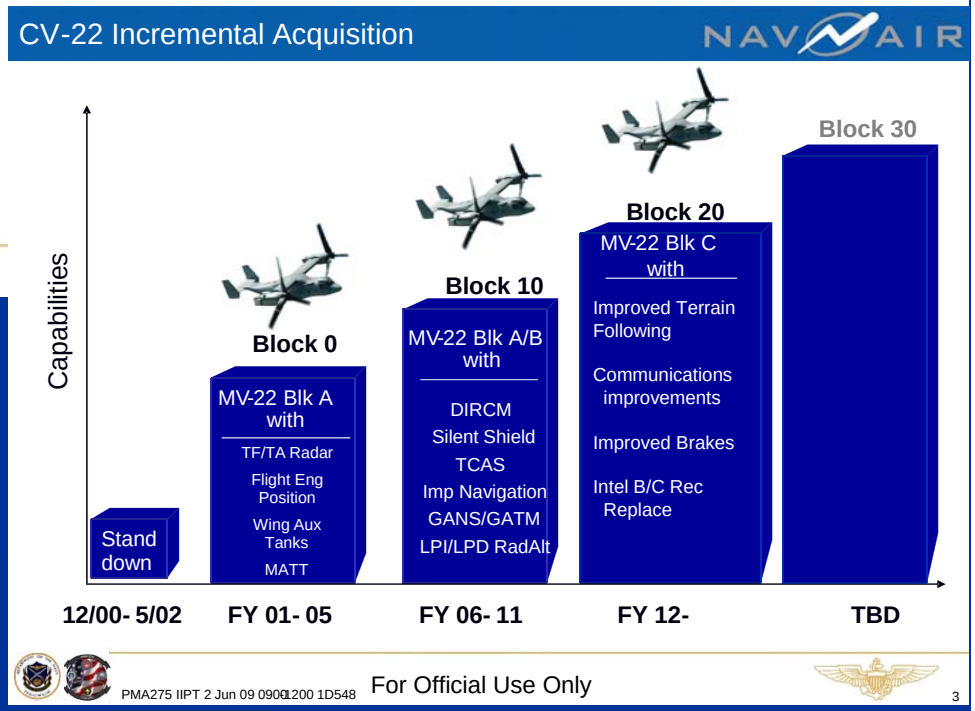


Versatility of a Helicopter – Speed/Range of a Turboprop

V-22 Block Upgrades



MV-22 / CV-22 Commonality	
Airframe	90%
Avionics	50%
Propulsion	100%



Joint Service Program
Multi-Mission Tiltrotor Aircraft

USMC

360 MV-22

- Combat Assault & Amphibious Assault
- Sustained Land Operations
- Self Deployment

USSOCOM

50 CV-22

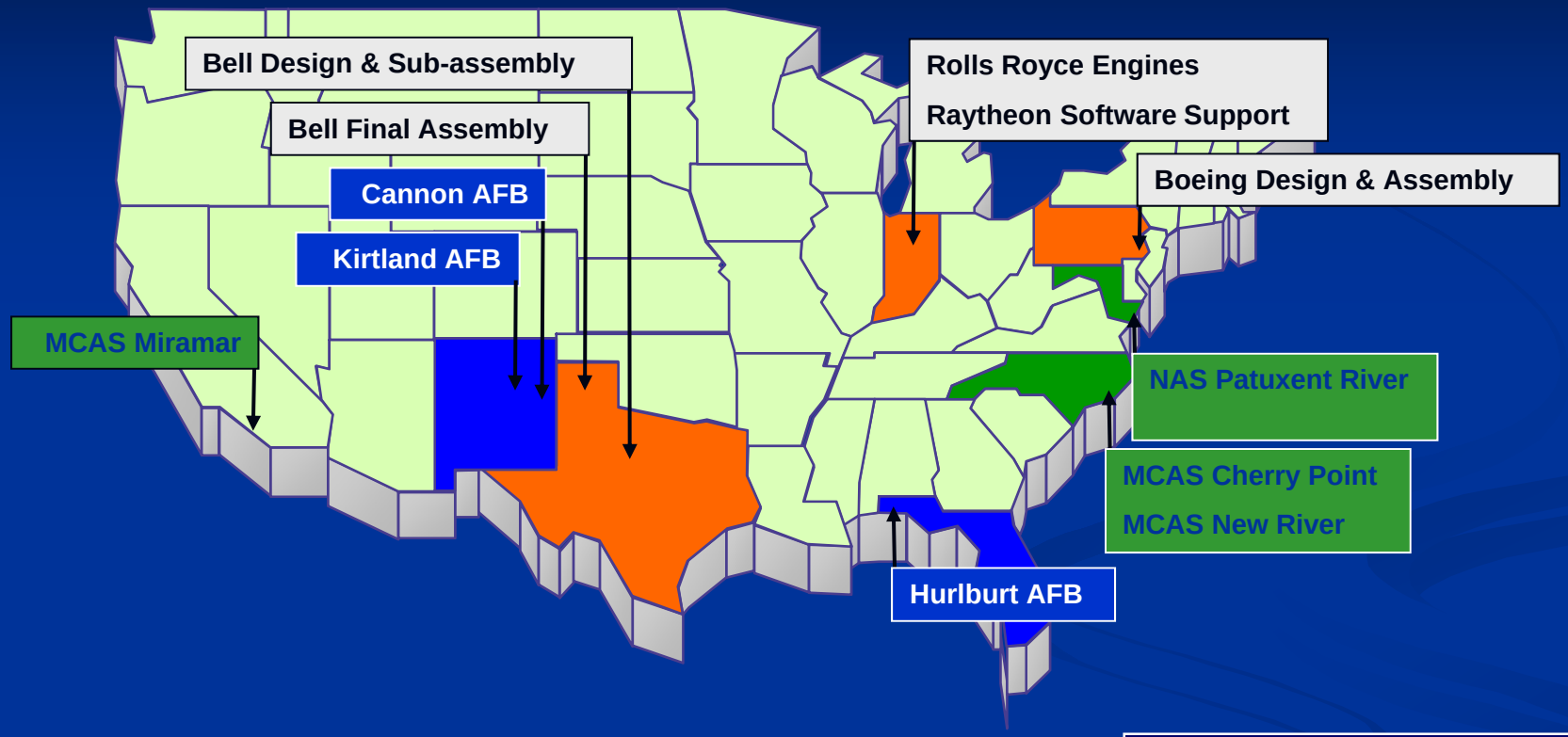
- Long Range Special Operations (SpecOps)
- Contingency Operations
- Evacuation & Maritime SpecOps

USN

48 MV-22

- Personnel Recovery
- Fleet Logistics Support
- Special Warfare
- Aerial Refuel

Location / Operational Inventory



In-Service Inventory
115 flying aircraft
8 ground trainers

Squadrons Deployed OCONUS

1 1 1

V-22 Advantage

Longest range
V-22 Operational Limit
350 nm
Combat Radius

CH-53D Operational Limit
200 nm
Combat Radius

CH-46
Combat Radius
75 nm/138 km

- Expanded battlespace maneuver
- Increased stand-off lowers forward basing risk
- Exponential operational impact
- Unprecedented survivability in assault support aircraft
- Tactical agility of a rotorcraft with turboprop performance

The Environment

MV and CV continue to excel in combat…it is aircraft of choice; flying full range of missions –
No question regarding its full spectrum of combat support

Operation Iraqi Freedom
October 2007 – April 2009

- **VMM-263 / VMM-162 / VMM-266**
  - Combat debut proved operational reach
  - More than 6,000 sorties
  - 10,000 combat flight hours
  - 71.6*% MC rate ~ Cumulative Mission Capability
  - 45,000 personnel transported
  - 2.2 million lbs of cargo moved
  - 3 squadron personnel rotations over 18 months

- Ground commander's area of influence broadened
- The MV-22B flew in every threat zone

"I could dominate [Al Anbar Province], because I had V-22s…I couldn't do what I did with just helicopters."

– MGen Kelly
CG MNF-W

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VMM MEU ACE Integration

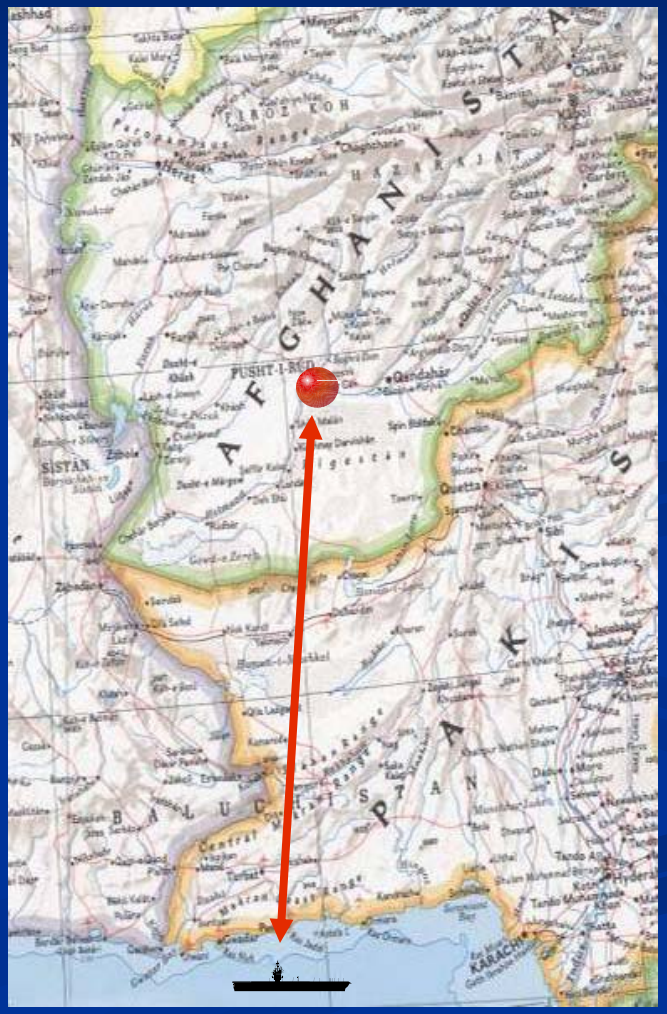
- **22 MEU deployment aboard USS BATAAN May – Nov 2009:**
  - Successful ACE integration
  - Demonstrated long range capability (MEDEVAC)
  - Bi-lat training Greece
  - Sustainment training, Udari Kuwait
  - Exercise Bright Star, Egypt
  - MV-22B's repositioned to OEF

- **24th MEU (Feb 10 - Present)**
  - Diverted to support Haiti relief operations
  - Conducting ACE Operations

MV-22B met all Amphibious Based Mission Requirements

MEU Support to OEF

- (10) MV-22s
  - 510 nm transit
  - 17,500'MSL
- Mission Flight Time:
  - 2hrs 15 min
- Long Range (+500nm) self-deployment milestone validation



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VMM OEF

Combat Mission Sets

- Multi National Forces – West Missions:
  - Air Assault
  - Raids
  - Direct Action
  - Casualty Evacuation
  - Central government engagement in remote tribal shuras
  - Battlefield Circulation
  - Logistical /Personnel Transport
- Tactics & Threat Mitigation
  - Utilized Low - Medium - High Altitude Tactics
  - Maximized inherent survivability characteristics of the MV-22B

MV-22B *capabilities* and *versatility* being showcased
In a more dynamic and austere environment

MV-22B Haiti
Operation Unified Response

- Long-range logistics runs to Guantanamo Bay, Cuba (over 200 nm)
- Movement of 492 personnel for site assessments at remote sites
- Movement of personnel for presence and security at multiple sites
- Movement of water and nearly 13,000 rations, rice, and medical supplies

"The overall advantage for using the Osprey is the efficiency with which we can get all of This done …The speed of the Osprey allows us to land multiple teams in areas all throughout northern Haiti, leave them there with enough time to get a good assessment and retrieve all these teams before nightfall – only using two Ospreys."

– Capt. Robert Shuford
24th Marine Expeditionary Unit

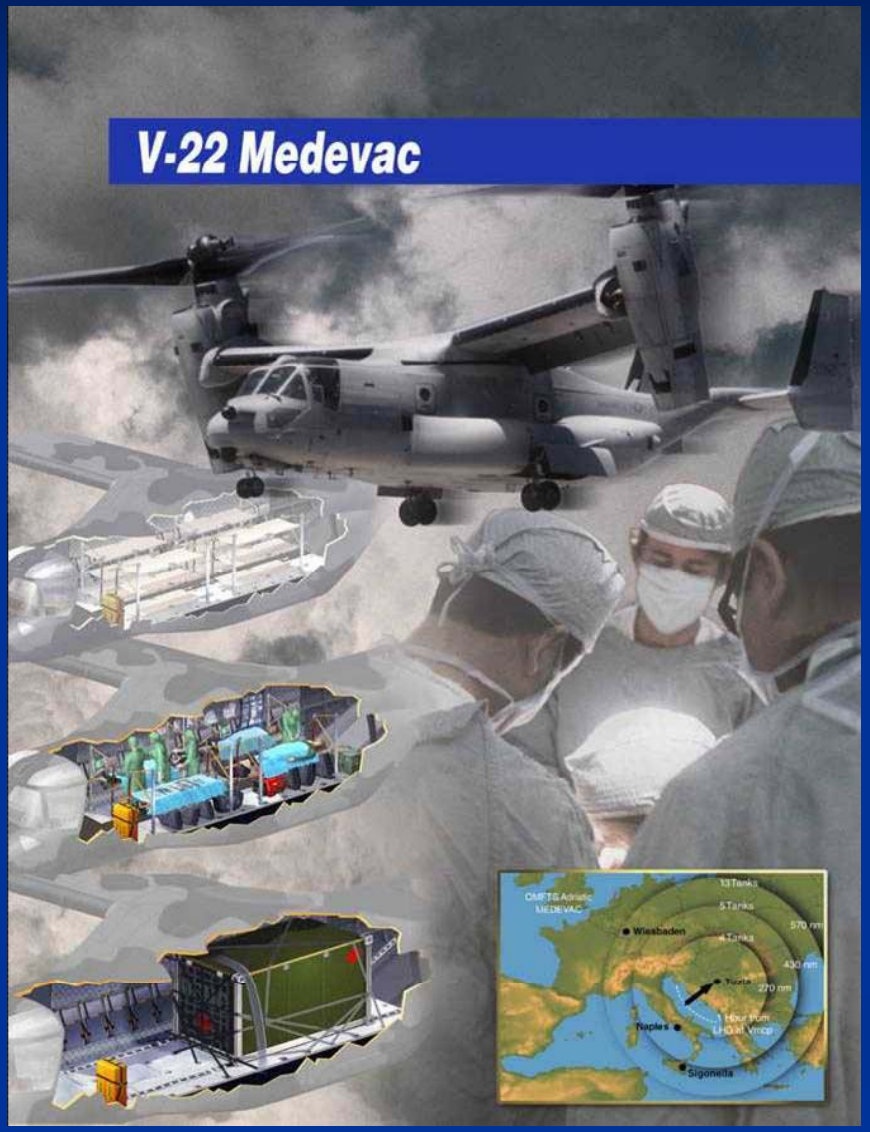
CASEVAC

***Golden Hour* preserved**
"…first 60 minutes following trauma or the onset of acute illness. The chances of survival are greatest if surgery or advanced trauma life support can be provided within that hour" [1]

- 25 Dec 2007
  - Urgent CASEVAC patient required transport from Mudaysis to Al Asad (80 nautical miles, one way)
- "Golden Hour" Preserved
  - In a scenario that conventional assault support assets could not execute, the MV-22B launched from Al Asad, flew to Mudaysis, performed pickup, and returned to Al Asad in under one hour (56 minutes total mission time)

[1] Guy S. Strawder, "The 'Golden Hour' Standard;" (Joint Force Quarterly / issue 41, 2d quarter 2006), 60-67.

MEDEVAC/CASEVAC



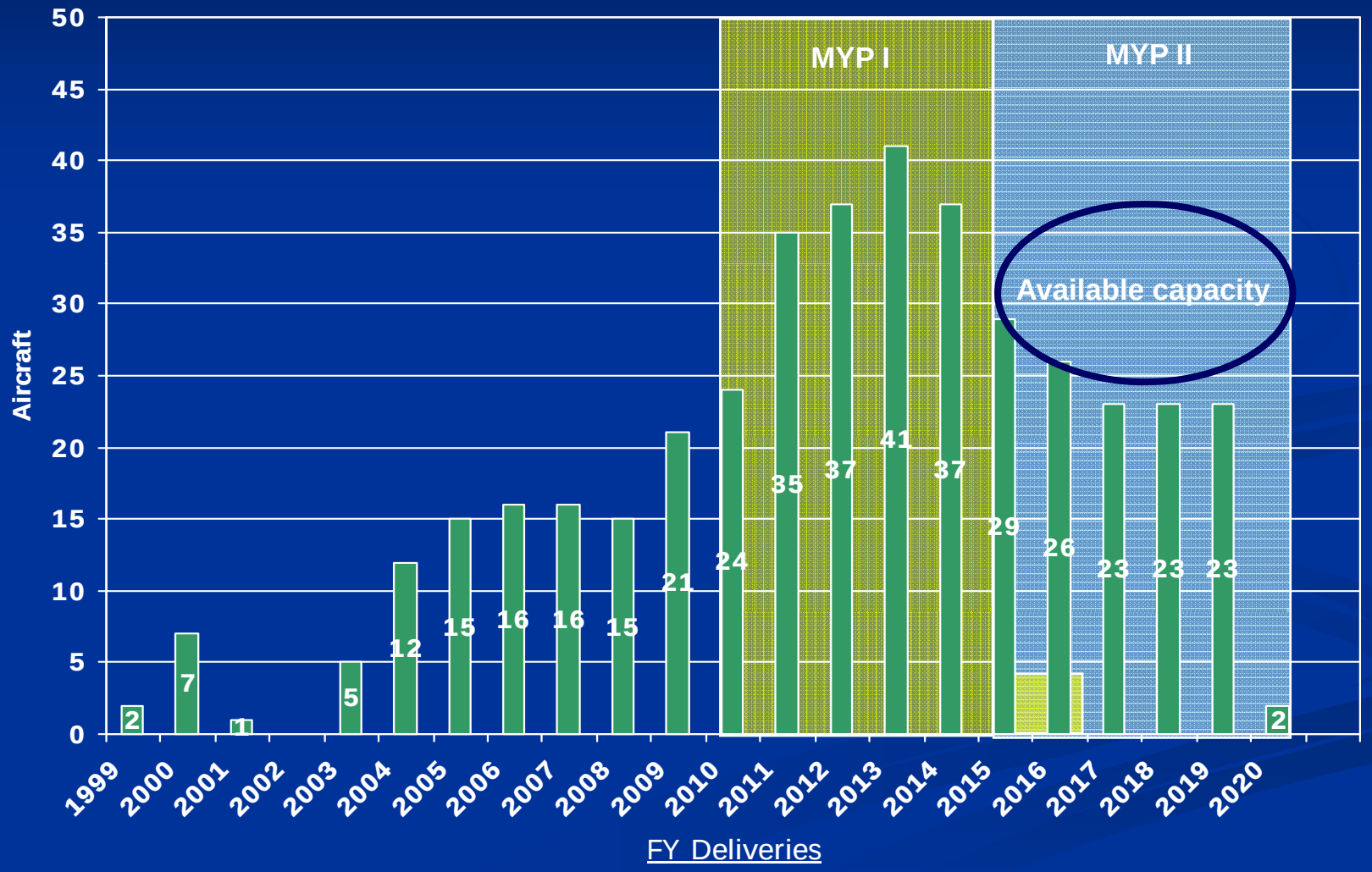
- *MV-22B Inherent Capability*
- *12 Litters Max Density*
- *LSTAT Compatible*
- *Cabin Communication Station*
- *4 Cabin Electrical Outlets*
- *Medical Grade Cabin Oxygen (OBOGS)*

Operation Iraqi Freedom
July – November 2009

- July 2009 – six CV-22s on their 1st Operational Deployment conducted a successful 7,000 nm self-deployment to Iraq
- Transatlantic crossing in 7 days while completing three aerial refueling
- CV-22s primary missions included long-range infiltration, exfiltration and resupply missions for special forces
- 45 direct assault force missions executed
- 123 combat service support missions
- 30,250 lbs of cargo delivered
- 2,349 personnel transported

Production Deliveries

Available Capacity for International Customer



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Pro V-22 considerations

- V-22 is not a New Start Program
- V-22 in production on multi-year contract
- Economic order advantages on production line
- No expenditure of Non Recurring Costs (common MV-22)
- Political advantages of Joint Service Program
- Platform life cycle expenditures shared across V-22 users (458 a/c & FMS) vs. small user community

V-22 Osprey
Multi-Mission Applications

- ➢ UAS - Unmanned Aerial Systems
- • UUV - Unmanned Underwater Vehicle
- ✓RGR - Rapid Ground Refueling
- ✓ AR - Aerial Refueling
- • ASW - Anti Submarine Warfare
- • ASuW - Antisurface Warfare
- ✓ SpecOps – Special Operations
- • AEW – Aerial Electronic Warfare
- ✓ Assault Medium Lift
- ✓ Tactical Mobility
- ✓ Forward Area Refueling (FARP)
- • Close Air Support
- ➢ Aerial Refueler
- ✓ SAR - Search and Rescue
- ✓ CSAR - Combat Search and Rescue
- ✓ MEDEVAC - Medical Evacuation
- ➢ C2 - Command & Control
- • Surface, Subsurface, Surveillance Coordination
- • Over-The-Horizon Targeting
- • Observation
- • Armed Reconnaissance
- • ASaC - Airborne Surveillance and Control
- ➢ COD - Carrier on Board Delivery
- ✓ VOD - Vertical on Board Delivery

✓ In Service
➢ In consideration
• Future consideration

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What's Important

CV-22's deliver aid in Central America

MV-22 CASEVAC Afghanistan

24th MEU Marines MV-22 transit to Haiti from USS NASSAU

MV-22 Assault Support in Afghanistan

MV-22 Assault Support in Afghanistan

Assisting Haitians near Grand Saline, Haiti

Perspective – Perseverance - Performance

Take Away

- V-22 can support and future operational doctrines
- V-22 multi-mission capability meets military & civil needs
- V-22 - In service; meeting operational tasking
- V-22 gives the Warfighter tactical agility of a rotorcraft with turboprop performance
- V-22 operates in demanding environmental extreme's
- Roll-in Roll-out kitted capabilities continue to grow
- Worldwide V-22 Tiltrotor accomplishments are real…….

Perspective – Perseverance - Performance