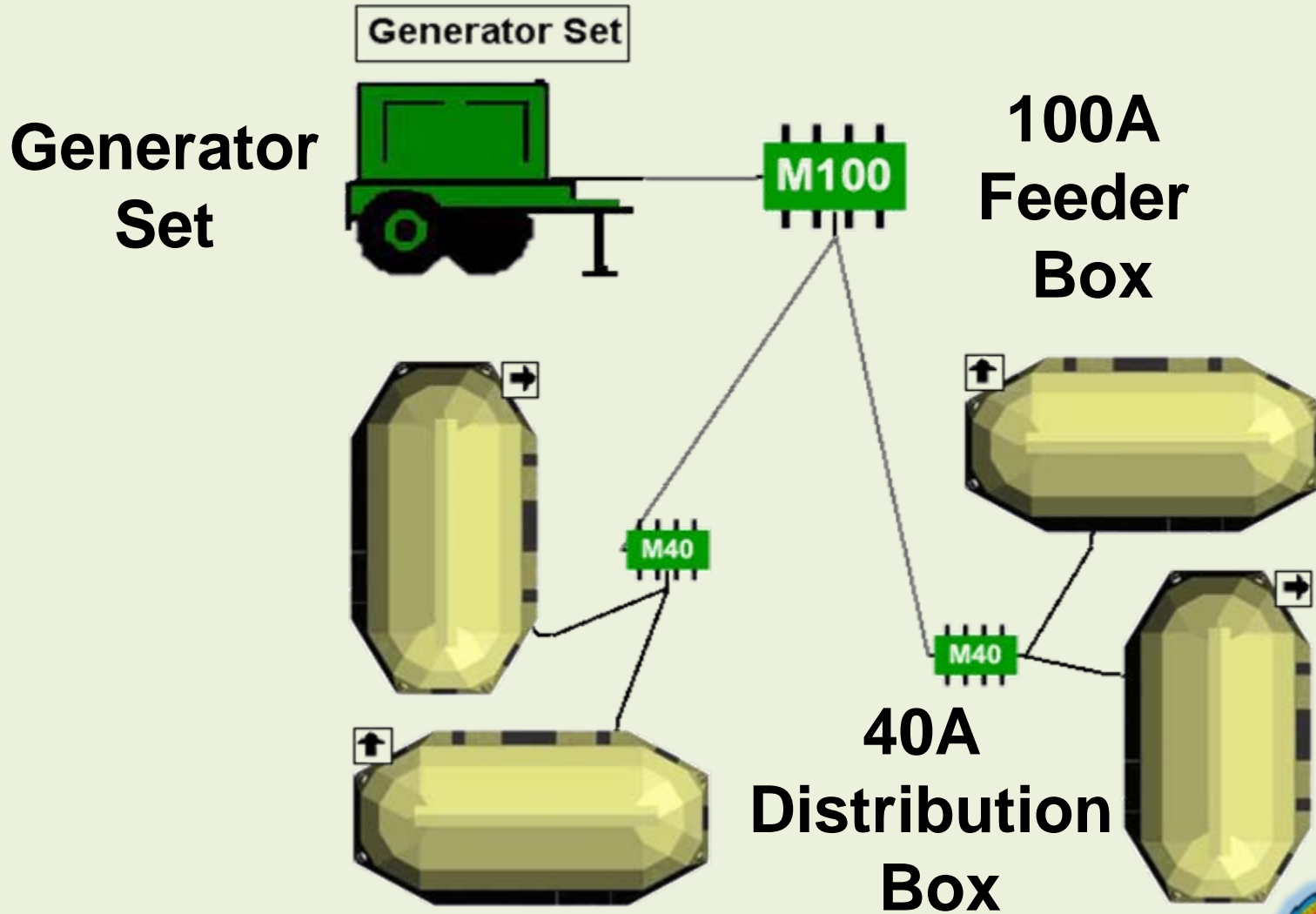


Introduction

- US Army utilizes TQG's for power generation & PDISE for power distribution.
- Power grid is setup based on recommendations of PM MEP.
- Typical setup:
 - a generator set or power plant
 - connected to a M200 or M100 feeder system
 - connected to a M40 and/or M60 power distribution system.



Introduction



IPM IPT Results

- Many who set up power grids in the field do not have the knowledge base to set up the grid, parallel generator sets or manually balance loads.
 - Potential safety issues due to poor grounding practices
 - Instances of poor power grid setup



IPM IPT Results

- Those who have the knowledge still have issues with improper electrical phase balance due to changing requirements.
 - Dedicated soldiers to manually balance loads
 - Frequent shut down of power grid
 - Potential lengthy time to restart if trained personnel are not available



Current System

- Has single phase outputs that must be manually wired in a balanced configuration
- No indication if a proper ground is present
- Reconfiguration requires power down



Recommendations

- Automatic Load Balancing
- Electrical Safety Features



Threshold

- Auto Load Transfer
- Diagnostics/Prognostics



Objective



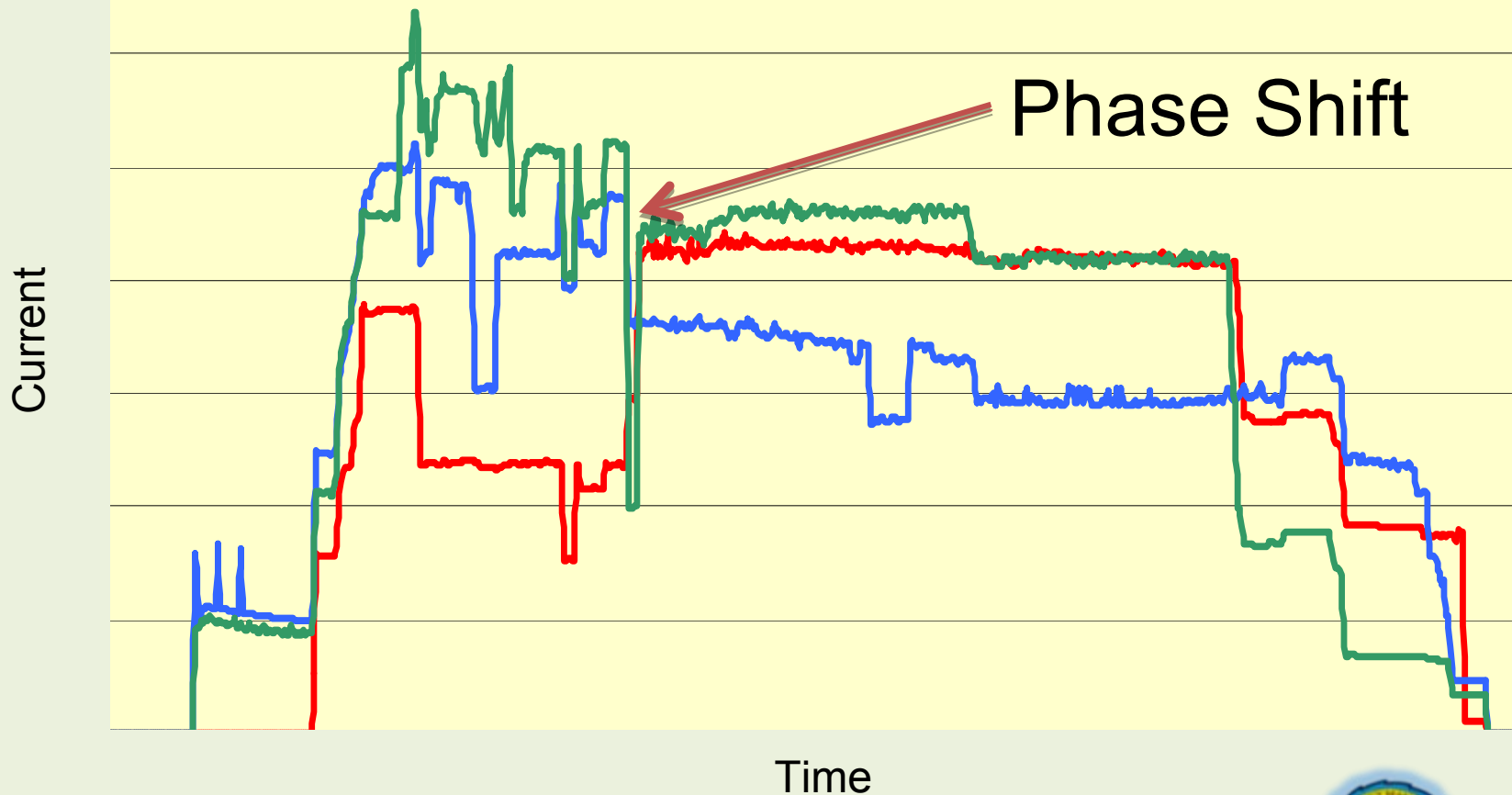
Initial Prototype Results

- Developed a prototype system that enabled some safety features as well as automatic load balancing
- The prototype system is a 200A system
- Taken to TOCFEST April 2008 and powered sensitive communications and network equipment



Initial Prototype Results

Average Current



Intelligent Power Management & Distribution

Defense Acquisition Challenge (DAC)

Army DAC Mission

Test & Evaluate non-developmental items that demonstrate potential to satisfy U.S. Army requirements and would then be procured.



Intelligent Power Management & Distribution

IPMDS Program Summary

The purpose of the IPMDS DAC Program is to purchase intelligent power distribution systems rated at 100 amps and 40 amps and to test these systems to determine if they can meet US Army electrical and environmental requirements. If successful, potential benefits include reduced training and increased reliability of the power grid.



Intelligent Power Management & Distribution

- Utilizing the “Comparative Test to Procure” method
 - Use funding obtained through the DAC program via OSD AS&C and PM MEP to develop and test multiple systems to achieve the program goals.
- Kick-off for the 2009 DAC Programs: November 5th 2008



IPMDS Requirements

- Physical Requirements
 - Weight: Less than or Equal to:
 - 77 lbs (100A), 55lbs (40A)
 - Size: Less than or Equal to:
 - 6.4 ft³ (100A), 4.91 ft³ (40A)
- Electric Power Quality
 - Operational Test
 - Automatic Electrical Phase Balance Test



IPMDS Requirements

- Electric Power Quality (cont)
 - Voltage and Frequency Regulation Test
 - 3% Voltage
 - 3% Frequency
 - Compatibility Test
 - Compatibility with current PDISE / DISE



IPMDS Requirements

- Electric Power Quality (cont)
 - Interface Test
 - Endurance Test
 - 250 hrs
 - Short Circuit Test



IPMDS Requirements

- Improper Ground Test
 - Protect and/or shield soldiers from shock hazards and contacting exposed (energized) circuits.
 - Will not energize the output terminals unless the power source is connected correctly to the loads.
 - Visual indicators that clearly show system status and function status



IPMDS Requirements

- Environmental Requirements
 - High Temperature Storage & Operation
 - 160°F (Storage) / 140°F (Operation)
 - Low Temperature Storage & Operation
 - -60°F (Storage) / -50°F (Operation)
 - Shock/Vibration



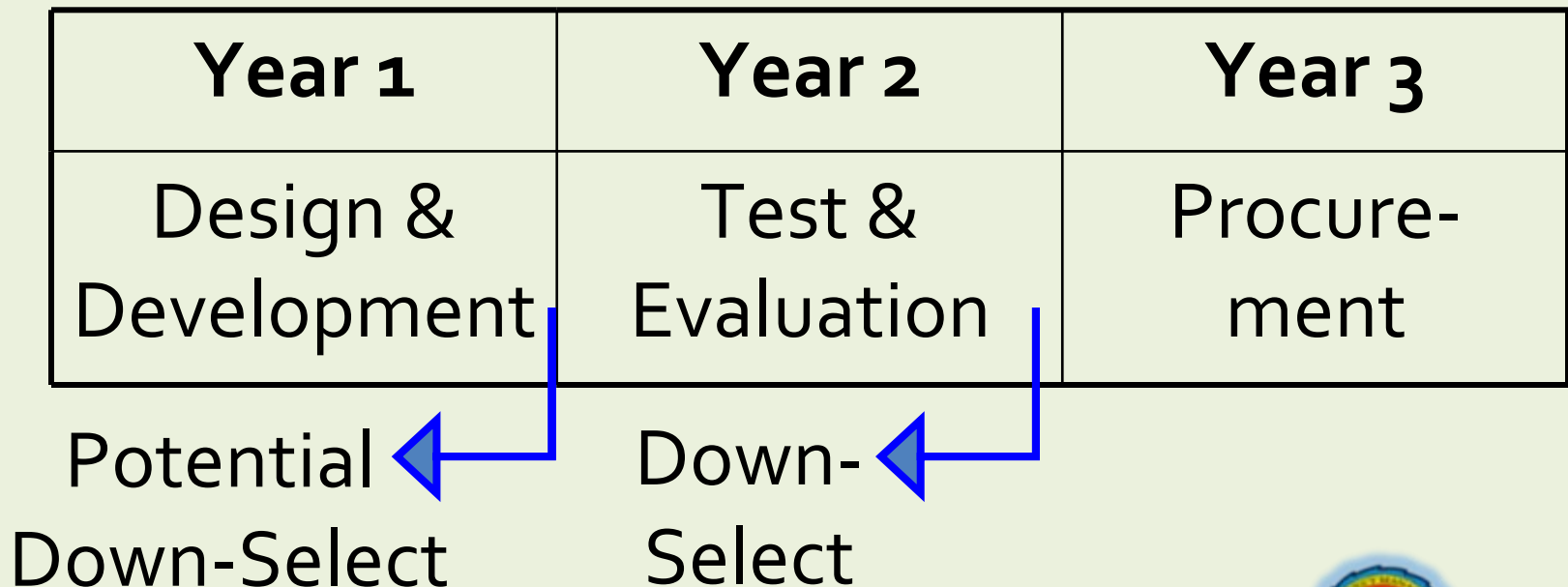
IPMDS Requirements

- Environmental Requirements (Continued)
 - Rain/Humidity
 - Fungus
 - Salt Fog
 - Sand and Dust Intrusion
- Signature Suppression
 - Electro-Magnetic Interference per MIL-STD 461



Intelligent Power Management & Distribution

- As stated in the DAC mission, it is the intent to develop, test and procure the IPMDS systems at the conclusion of this program.



Bridge to the HI Power Program

Hybrid Intelligent Power Program Objective

Develop and validate a standard tactical intelligent power management architecture that incorporates source management, demand management, and transient management with plug and play capability to accept any type of available power source while allowing interoperability with legacy equipment.



Bridge to the HI Power Program

- IPM will enable some of the objectives of the HI Power program including:
 - Demand management
 - Interoperability with legacy equipment
- In addition, IPM will enable full utilization of power sources therefore reducing overall fuel consumption



Summary

Benefits of IPM

- Reduced time to setup and establish an effective power grid
- Perception of increased power availability
- Maintain high mission readiness
- Decreased fuel consumption
- Safety features to protect Warfighters

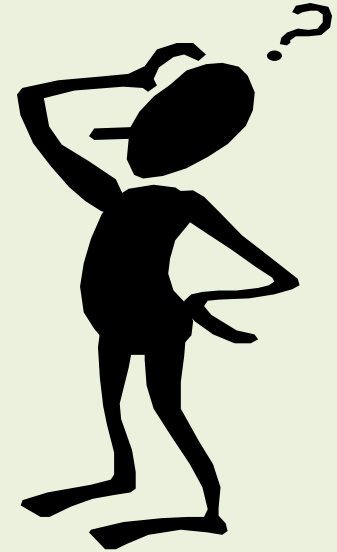


Summary

Overall IPM will reduce the training burden on the Warfighter, increase reliability of the power grid, decrease critical mission equipment failures, increase the safety of the power grid and create a more efficient use of power systems.



Questions?



Michelle N Gaffney
(703) 704-4890

Michelle.Gaffney@us.army.mil
www.cerdec.army.mil/c2d/armypower

