



Accelerating the Electrification of U.S. Drive Trains: Ready and Affordable Technology Solutions for Domestically Manufactured Advanced Batteries

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Project ID #
ARRAVT004

Overview

Timeline

- Begin Negotiation - Aug 2009
- Start Project - Dec 2009
- Project Finish - Dec 2012
- Percent complete - 12%
(effective Mar 2010)

Budget

- Total project budget - \$69.9M
 - DOE share - \$34.3M (49%)
 - Exide share - \$35.7M (51%)
- Funding received in FY09 = \$0
- Funding Plan for FY10 = \$15.3M
FY11 = \$16.1M
FY12 &13 = \$ 2.9M

Barriers & Targets

- Advanced Battery Production Capacity - (Domestic) to Enable Advanced Vehicles
 - Improved Energy Efficiency
 - Reduced Dependence on Foreign Oil
 - Reduction in Greenhouse Gasses
 - Enhancing National Security
- ARRA Targets
 - Stimulate Economy
 - Increase Domestic Employment

Partners

- No Project Partnerships
 - Exide Share – Internally Funded
- Customer Support
 - 17 Commitment/Support Letters
- Material Vendor Support
 - Strategic Supply Agreements

Project Objectives

DOE Merit Review - 2010

- ❖ This project covers the expansion of Exide Technologies' manufacturing capacity for producing advanced batteries in existing U.S.-based battery plants
 - The project plan is to implement a combined increase in yearly production capacity of 1.5 million additional units at two of Exide's current manufacturing locations
 - Columbus, Georgia
 - Bristol, Tennessee
 - These advanced battery technologies are targeted to have an accelerated near-term impact (in high volume) for micro-hybrid vehicles, idle reduction commercial vehicles, and other strategic market segments

Project Objectives

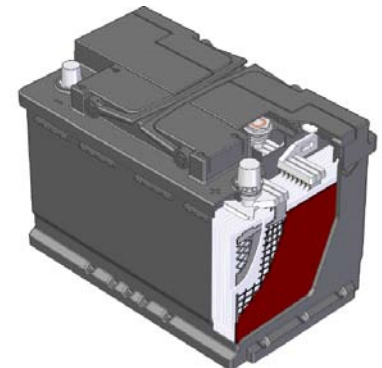
DOE Merit Review - 2010

- ❖ This manufacturing expansion project involves two of Exide's global technologies: a Spiral Wound Absorbed Glass Mat (AGM) design and a Flat Plate AGM design, both of which will be manufactured with advanced carbon technology as required by customer specific advanced vehicle applications –

Spiral Wound Example



Flat Plate Example



Project Objectives

DOE Merit Review - 2010

- ❖ The Exide Advanced Battery Expansion Project Addresses Key Program Targets - ARRA and VT Program
 - \$70M in direct economic activity in two domestic locations over the 3 year scope of the project
 - 320 manufacturing jobs in areas hit hard by the economic downturn
 - 200 jobs in Columbus GA
 - 120 jobs in Bristol TN
 - When installed in vehicles incorporating energy management technologies, these advanced batteries enable a savings potential of
 - 75 million gallons of fuel per year → more than \$200M at the pump
 - 3 million barrels reduction of imported oil per year
 - 600,000 metric tons of CO₂ per year in reduced emissions

Project Milestones

DOE Merit Review - 2010

- FY09
 - ARRA Award Announced – Aug 09
 - Negotiation Period – no project activity allowed
- FY10 – Progress
 - DOE Agreement Finalized – Dec 09
 - 10% spending cap pending NEPA CA
 - DCAA Audit Report Accepted – Mar 10
 - Go/No-Go NEPA CA (FONSI) – Mar 10
 - Full approval achieved / spending cap removed

- ❖ This project is being carried out in four major project phases at each location over the 3-year life of the project

- Project Phases

- 1) Design Project and Arrange Funding
- 2) Procurement & Installation
- 3) Shakedown & Qualification
- 4) Production Ramp-up & Market Deployment

❖ The project deployment plan - key items

– Project Task Areas

- 1) Pre-Agreement Planning
 - a) Prepare documents for NEPA EA
 - b) Preliminary product engineering planning
 - c) Order long lead time equipment
- 2) Project Management and Planning
 - a) Product design and planning
 - b) Order remaining equipment
 - c) Environmental Permitting
 - d) Receive, Install and Debug Equipment
 - e) Deliver to the DOE of 100 batteries manufactured from each completed manufacturing facility from low rate initial production for validation purposes
- 3) Production Scale-up including Hiring and Training of New Manufacturing Employees
- 4) Achieve Production and Product Performance Targets

Accomplishments

DOE Merit Review - 2010

- ❖ The Exide Battery Expansion Project was only Recently Fully Approved and has Now Begun the Full Implementation Phase
 - Successful DOE negotiation period to achieve Cooperative Agreement (Aug '09 – Dec '10)
 - Successful NEPA Environmental Assessment (*EA*) resulting in Finding of No Significant Impact (*FONSI*) for both project sites (Sep '09 – Mar '10)
 - Successful DCAA Audit report regarding financial systems and controls (Sep '09 – Mar '10)

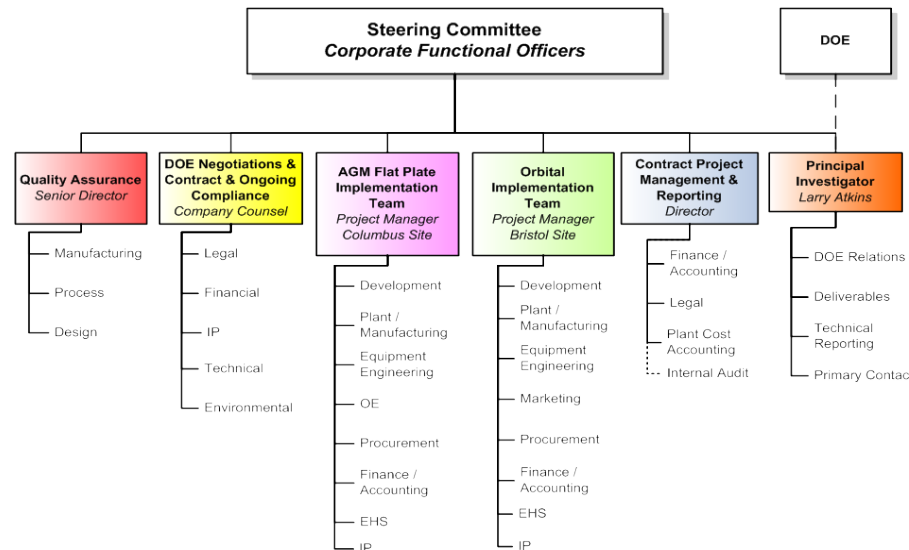
Accomplishments

DOE Merit Review - 2010

❖ Project Management

— A formal organization has been implemented

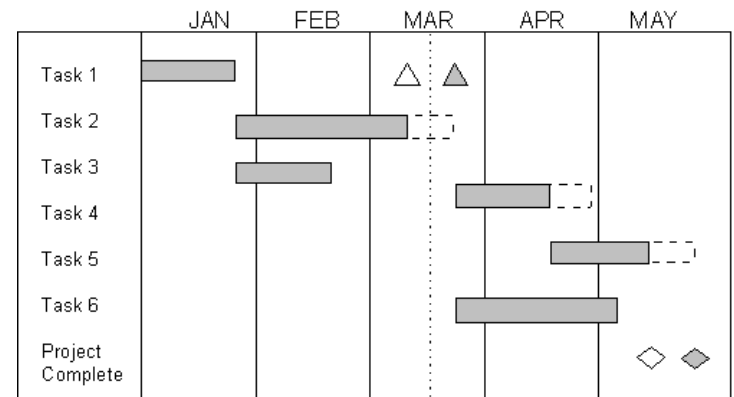
- High-level Steering Committee was formed with corporate officer leadership and direction
 - Periodic meeting schedule - established & on track
- Functional teams were formed with experienced leaders



Accomplishments

DOE Merit Review - 2010

- ❖ Project Management Structure
 - Implementation team established
 - System software decisions and upgrades
 - Special refresher training completed
 - PMBOK Principles
 - Common deployment across project sites
 - DOE EVM spreadsheet
 - Verified conformance
 - Training for key team members



Accomplishments

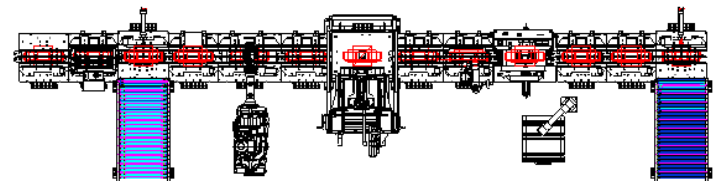
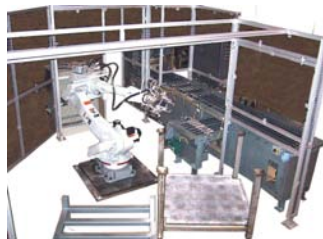
DOE Merit Review - 2010

- ❖ Project Deployment
 - Columbus GA Site ~ Flat Plate AGM
 - Full time Project Manager hired to run project
 - *Weekly Columbus Update meetings*
 - cross functional team members
 - executive staff from commercial divisions
 - *Weekly Columbus team meetings*
 - Focused local task assignments and reviews
 - *Major equipment/process technical reviews*
 - Ongoing and structured to achieve needs

Accomplishments

DOE Merit Review - 2010

- ❖ Project Deployment
 - Columbus GA Site ~ Flat Plate AGM
 - Critical Path Equipment on track
 - Specification and procurement planning
 - Layout decisions and implementation schedule



Accomplishments

DOE Merit Review - 2010

- ❖ Project Deployment
 - Bristol TN Site ~ Spiral Wound AGM
 - Full time Project Manager hired to run project
 - *Weekly Bristol Implementation meetings*
 - Cross functional team members
 - Focused local task assignments and reviews
 - Major equipment/process technical reviews
 - Ongoing and structured to achieve needs
 - Engineering planning has commenced with focus on details of plant layout options, equipment specification and production estimates

Accomplishments

DOE Merit Review - 2010

❖ Project Deployment

– Bristol TN Site ~ Spiral Wound AGM

- Environmental modeling activities underway to allow required permitting according to work plan
- Equipment procurement activities on track
 - Vendor visits, quoting and contract negotiations
- Product Engineering on target plan
 - Finalized definition of full product line by SKU
- There has been no slippage in projected timing from the date of the CA, no changes that would impact either the scope or cost of the project, and no foreseen problems that would prevent a successful completion of the project

Collaboration

DOE Merit Review - 2010

- The Exide Advanced Battery Capacity Expansion Project Does Not Involve Direct Project Partners
 - Internally Managed Manufacturing Capacity Expansion
 - Company share internally funded
- Customer Commitments/Agreements
 - Proprietary listing of 17 supporting agreements with world-class Automotive / Truck / Military OEMs; as well as, associated Industrial products customers
- Material Vendor Agreements and Support
 - Strategic supplier agreement with Axion Power International, Inc., a developer of advanced batteries and components that incorporate patented lead carbon battery PbC Technology™
 - Support from all material and supply vendors within the required time frame to meet full production capacity goals

Upcoming Work

DOE Merit Review - 2010

- ❖ Major Progress Planned During FY10 & FY11
 - Both sites scheduled for heavy front loaded spending for major equipment during period
 - ~44% of total project spending in FY10
 - ~47% of total project spending in FY11
 - Production line sites will be readied in FY10 for equipment installation in FY10 & FY11
 - Certain key items will be early and implemented
 - Hiring will continue but will lag rate of spending due many long lead times on substantial list of capital items

Summary

DOE Merit Review - 2010

❖ Exide's Battery Expansion Project

- **Relevance** - Ready and affordable technology solutions for domestically manufactured advanced batteries / accelerating the electrification of U.S. drive trains. Helps achieve domestic targeted goals for economic growth and employment, while enabling advanced vehicles that will reduce dependence on foreign oil, reduce emissions, and reduce green house gasses – all enhancing our national security.
- **Approach/Strategy** – Project management planning and system implemented for structured earned value management approach. Four project phases administered at two production sites with centralized direction and local deployment teams. Task planning structured and planned to achieve project objectives.
- **Accomplishments** – Cooperative Agreement negotiation completed Dec '09 and final requirements removing spending lid achieved Mar '10. Project sites active with project teams and activities progressing according to plan. There has been no slippage in projected timing from the date of the CA, no changes that would impact either the scope or cost of the project, and no foreseen problems that would prevent a successful completion of the project.
- **Collaboration** – Exide's project does not include partner relationships. The company share of the funding is supplied fully from internal sources. Key customer relationships and strategic vendor support agreements will enable commercialization plan.
- **Upcoming Work** – Accelerating deployment activities are planned for FY10 and FY11 with over 90% of the total project spending during that period. Long lead time on major capital equipment will cause employment numbers to proceed, but will lag spending.