

Section 7.12 PEO LS Program

LIGHTWEIGHT 155MM HOWITZER

Program Background

A cornerstone of the PM Towed Artillery Systems (PM TAS) portfolio is the “Triple Seven,” or the M777A2 Lightweight 155mm Howitzer. Produced by BAE Systems in the United Kingdom, the Lightweight 155 is a Marine Corps led joint program with the Army. The M777A2 replaces the Marine Corps’ outdated M198 155mm weapons.

The M777A2 is capable of firing standard (unassisted) projectiles to a range of 15 miles (24 kilometers), assisted projectiles to 19 miles (30.5 kilometers), and the Excalibur munitions to ranges in excess of 25 miles (40 kilometers).

The world’s first artillery weapon to make widespread use of titanium and aluminum alloys, the lightweight M777A2 can be air-lifted into remote high-altitude locations inaccessible by ground transportation and is capable of being transported by the Marine Corps’ V-22 Osprey as well as medium and heavy-lift helicopters.

Program Status

There are currently 1,071 M777 howitzers: 481 for the Marine Corps and 518 for the Army, with the balance for foreign military sales customers Canada and Australia. To date, over 1000 of these systems have been fielded, with the remaining quantity



supporting ongoing Army fielding. The final USMC M777A2 was fielded in April 2014 with Full Operational Capability achieved in June 2011.

The M777 Program has commenced activities to “refresh” the system’s digitized fire control system. Described as a leap-ahead, towed artillery technology, the digital fire control has transformed how Marines employ artillery. As part of the refresh effort, a new Gunners and Assistant Gunners Display (GD/AGD) commenced fielding in 2014. Using recent advances in display technology, the display has greater reliability along with greatly improved sunlight readability at a lower overall cost. Other refresh initiatives entering production in 2015 are a new Mission System Computer, Chief of Section Display, and power supply.

LW 155’s Top Technical Issues:

1. Safe and Transportable Battery High Capacity Technology

The M777A2 howitzer, as well as other towed artillery platforms, power their electronics with onboard (rechargeable) batteries. The current platforms have power requirements in excess of 2 KWH. Current High Capacity Battery technologies are mainly Lithium Ion based, which requires extensive regulatory qualification testing when the power pack exceeds 1 KWH. As a result, towed artillery Program Managers seeking improved battery performance are required to execute significant development efforts (at significant expense) to design and qualify “system specific” power packs. In order to mitigate this, PMs request that industry invest in safe and transportable battery technology that could be implemented into weapons systems in a modular fashion, without the need for “system specific” power packs and the extensive regulatory qualification requirements that come with them.



2. Secure Wireless: Ruggedized/Low Energy

Communications between interfacing components of the M777A2 digital fire control systems is accomplished over physical wires. The required cabling constrains the solution space and introduces points of failure, particularly for cables that need to flex or be moved as part of normal operations. A short-haul, low energy wireless data transmission can eliminate use of physical wires. Although commercial standards exist, a ruggedized solution using a dongle-like device is required. The solution should be adaptable to enable either serial or Ethernet wireless communications between components. This technology may be incorporated into future devices such as wearable devices and onboard sensors.

3. Navigation in a GPS Denied Environment

The navigation systems for the digitized howitzers are dependent on GPS assistance to maintain full operational capability. GPS denial would degrade howitzer operational tempo and adversely impact delivery of timely fire in support of maneuver. Innovative approaches to counter or mitigate GPS denial at minimum SWaP are required. The technologies could be items such as anti-jam antennas, sensor fusion schemes to leverage other available sensors, or other technologies to establish howitzer location to better than 4m accuracy in a GPS denied environment.



LW155 (M777A2) Howitzer

LW155
Sustainment
1QFY15
DEC 2014



USMC	FY05	FY06	FY07	FY08	FY09	FY10	FY11	FY12	FY13	FY14	FY15	FY16	FY17	FY18	FY19	FY20	Total	
Phases	Production																	
Milestones	▲ IOC					FOC												
Contract Award	▲ RFP																	
Deliveries	EPH																	
DT - completed FY 03																		
QA - completed FY 02/07																		
	PY	FY06	FY07	FY08	FY09	FY10	FY11	FY12	FY13	FY14	FY15	FY16	FY17	FY18	FY19	FY20	Total	
RDTE	1753						1.6				0.2	0.2	0.0	0.0	0.0	0.0	177.5	
Production	428.4	174.4	367	240.3	191.2	80.0	30.6	16.3	17.7	4.2	4.5	7.5	2.7	0.4	0.2	0.2	1334.3	
OMMC	2.3	6.2	5.4	3.5	6.4	5.8	6.6	4.9	9.6	11.4	13.6	15.0	16.6	16.8	17.1	17.5	158.7	
Quantities	200	75	34	100	62	18	22										511	

Mission:

Provide direct, reinforcing, and general support fires to maneuver forces. Direct support artillery for the Stryker Brigade Combat Teams. Replaced the M198 howitzer as the general support artillery for light forces in the Army. Replaced all howitzers in all missions in the USMC.

Capability / Improvements:

- Improved lethality & strategic deployment
- Increased tactical mobility & reliability
- Improved Survivability (decreased emplace/displace time -- shoot and scoot tactics with digital fire control)
- Digitizes Army and USMC towed artillery
- First artillery platform with Excalibur capability fully embedded

Requirements:

- Weight** 10,000 pounds or less
- Emplace, Displace** <3 min, 2-3 min
- Maximum Range** 30 km (assisted)
- Rate-of-Fire** 4/min max, 2/min sustained
- Prime Mover** Current 5T truck, FMTV, MTVR
- Air Mobility** MV22, CH53D/E, CH47D
- Fire Control** Digital & Optical
- Precision Fire** Excalibur Capable & PGK Capable

Status:

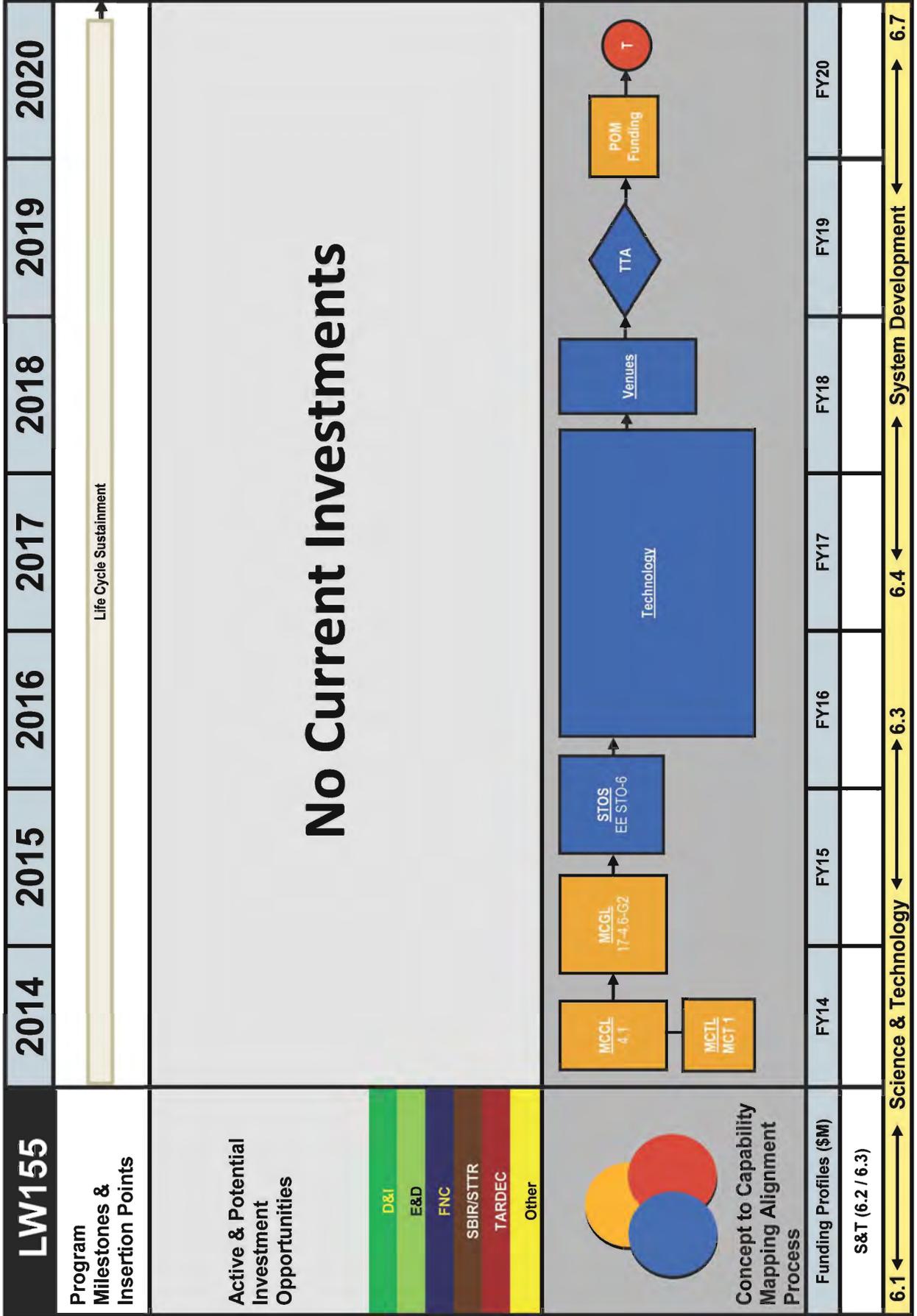
- Nov 04 JORD – All KPP's Met
- Joint Program
- Full Rate Production Complete (1090 weapons purchased)
- Last weapon delivered in Jan 2014 (USMC Apr 2013)
- USMC and FMS fieldings complete. Army still fielding.
- All Weapons Excalibur Capable
- FMS Cases with Canada & Australia
- PBLCS: Currently in Year 2 of potential 10 yr contract.

	IOC	FOC	AAO	AAO Funded	AAO Unfunded
USMC	Dec 05	Jun 11	481	511*	0
Army	Oct 06	Jun 14	542	488	54

* 30 weapons transferred to Army in exchange for HIMARS



LW155 Technical Issue #2 Secure Wireless: Ruggedized/Low Energy





LW155 Technical Issue #3 Navigation in a GPS Denied Environment

