



Status of
30mm MK317 MOD 0 TPDS-T
USMC/USN Qualification Program

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Outline of Presentation

- Background of Selection of the 30mm MK317 TPDS-T
 - Trainer Ctg for Combat APFSDS-T Ctg
 - From FCT to USMC Lead Program
 - NATO Qualification of 30mm TPDS-T
- Qualification by Analogy & Test
- Qualification Testing
 - Hawthorne Test Range – SDZ & Ranging Tests in Dec 2010
 - NSWCDD Test Range – Future Qualification Tests ?
- Summary & Future Work



Background of 30mm MK317 TPDS-T

- 30mm Target Practice Discarding Sabot (TPDS-T) was submitted as a Foreign Comparative Test (FCT) Proposal in 2007 & 2008 (Not Selected)
 - Joint USMC, US Navy, and US Army Effort
 - Flight Characteristics similar to APFSDS-T out to 1500m
- Qualification of 30mm MK317 as “Not New Item”
 - RWM-S TPDS-T Qualified by Analogy to the MK268 MOD 0 APFSDS-T Combat Cartridge - 2009
 - Plan to Qualify ATK, GD-OTS and NAMMO 30mm TPDS-T variants in 2010 & 2011 for Increased Competition
- USMC/USN & NATO Qualification of MK317 in FY2011



30mm MK317 SDZ & Ranging Ballistics TPDS-T Requirements

- 30mmx173 TPDS-T Cartridge (Ctg) Compatible for use in the 30mm MK44 Chain Gun (Loading, Firing, and Ejecting)
- Ballistic Match (1 mrad) to the 30mmx173 MK258 APFSDS-T Ctg from 100 meter (m) to 1500 m Range
 - Projectile trajectory time-of-flight (ToF) within 0.5 second of the MK258 projectile ToF out to 2500 meters Range
- Surface Danger Zone (SDZ) of less than 8,300 meters
 - Max Sabot Debris Distance - 400m
 - Sabot Discard Angle - Less than 30° off Line-of-Fire
- Compliant with USN Insensitive Munitions

30mm MK317 TPDS-T Variants Evaluated at Hawthorne

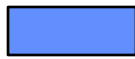
GD-OTS TPDS-T

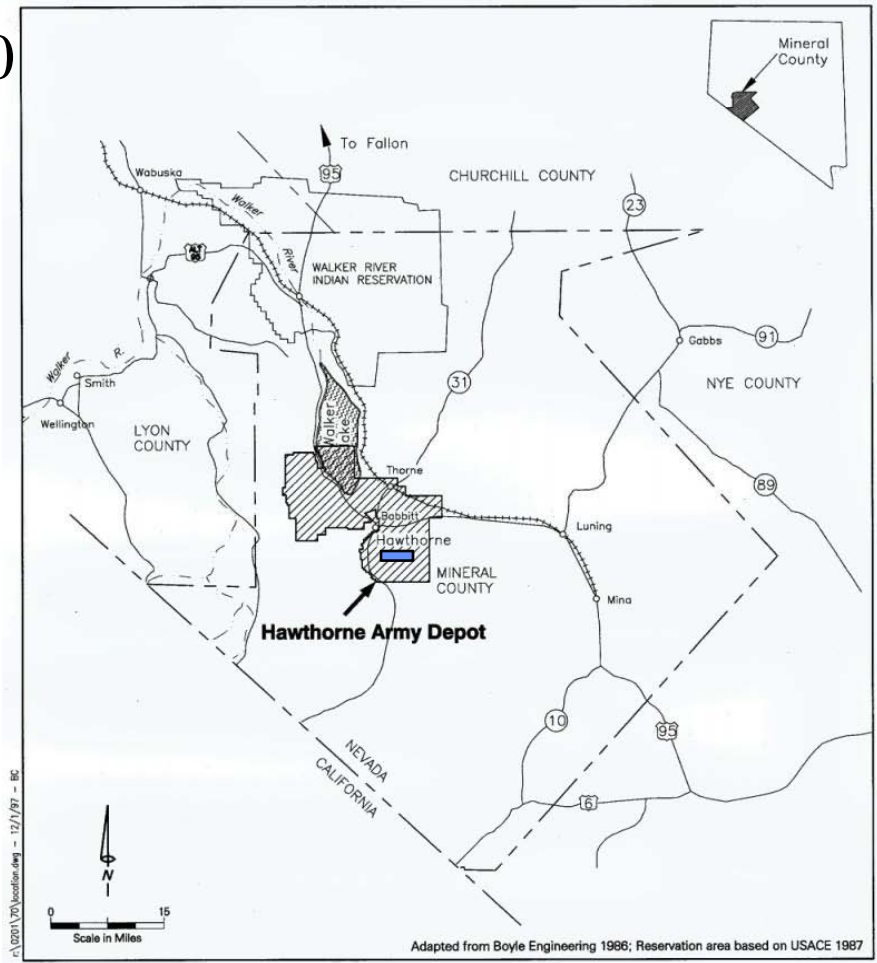
ATK TPDS-T



NAMMO TPDS-T

30mm TPDS-T SDZ & Ranging Test at Hawthorne, Nevada

- Testing conducted in December 2010
 - Bravo Impact Range ()
 - 500m & 800m Target Range
 - 5°, 8°, & 12.5° Impact Angles



Legend

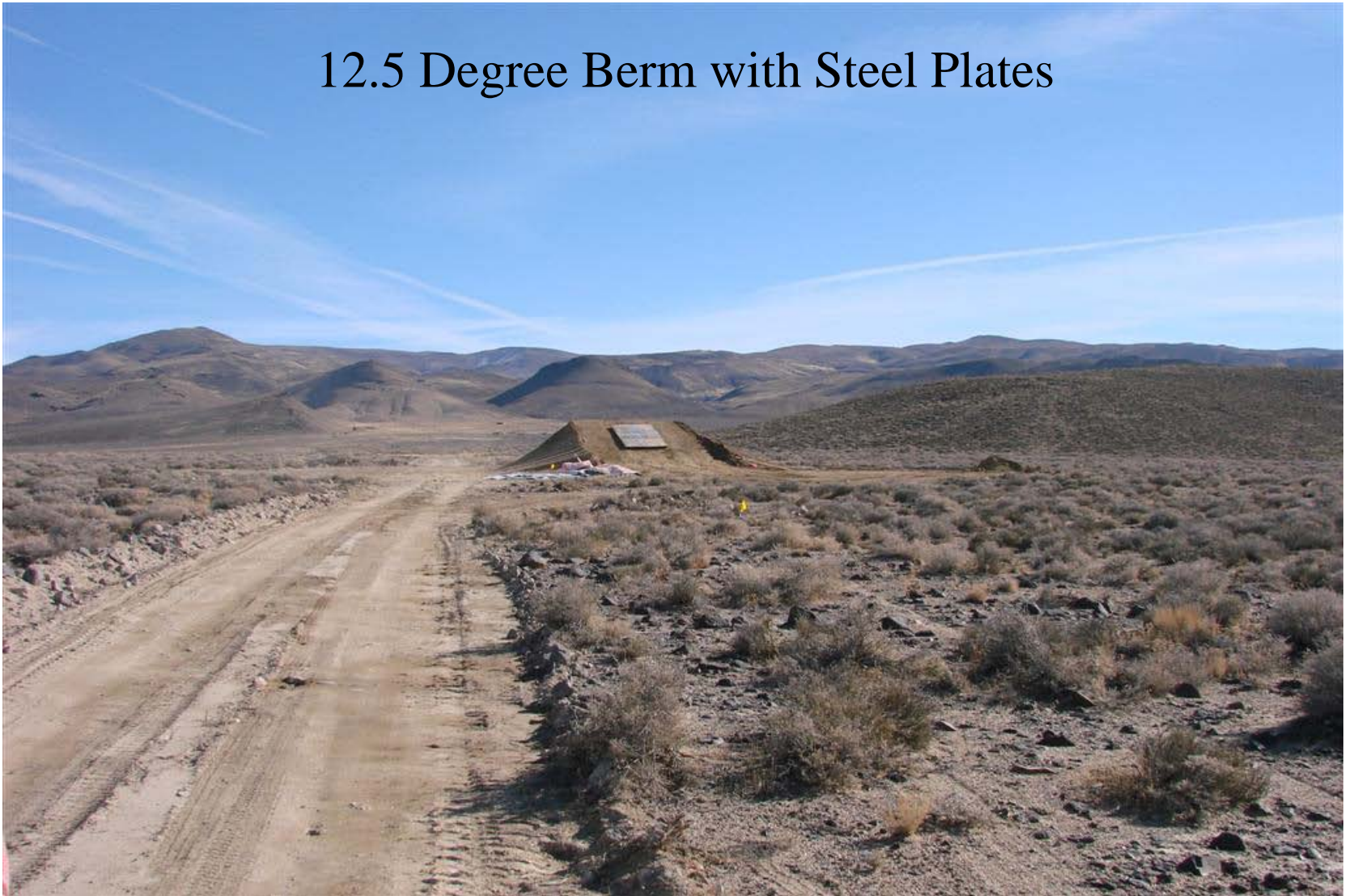
 Hawthorne Army Depot

Location Map

Hawthorne Army Depot
Hawthorne, Nevada

30mm MK317 SDZ Berm Setup

12.5 Degree Berm with Steel Plates



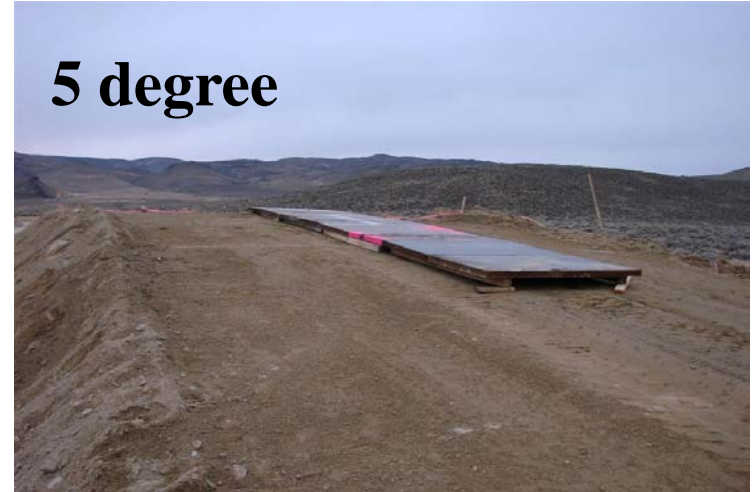
30mm MK317 TPDS-T SDZ Test Berms

Earth & Steel Berms

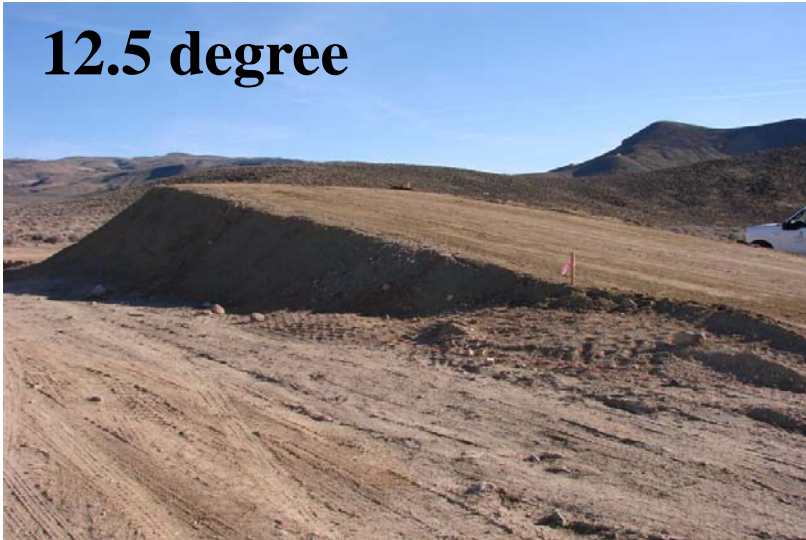
5 degree



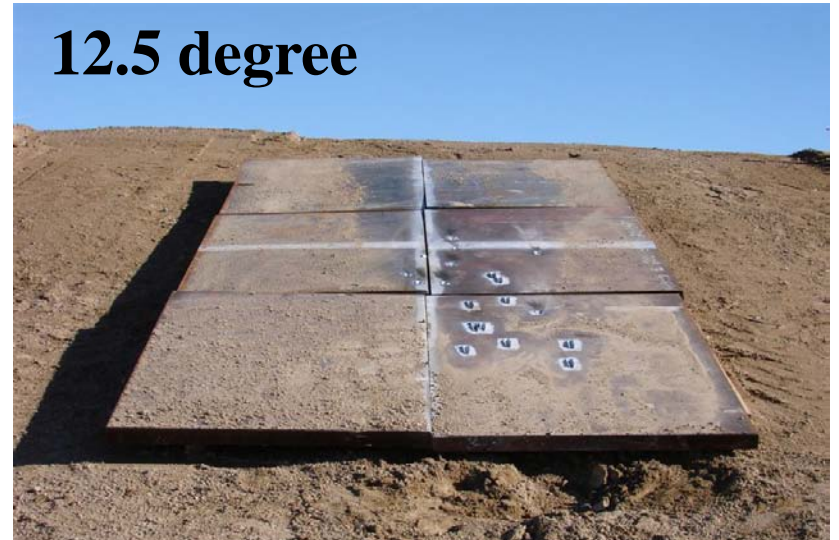
5 degree



12.5 degree



12.5 degree



30mm MK317 Ranging Test Set-up

30mm Mann Barrel & Tracking Radar





30mm SDZ Test Matrix

- 30mm TPDS-T SDZ Test Requirement – 10 Valid Ricochets per Test Event

Impact Media	Range (m)	Impact Angle(deg)	ATK (Rds)	GD-OTS (Rds)	NAMMO (Rds)
Armor Plate	500	12.5	15	15	15
Earth	500	12.5	15	15	15
Armor Plate	500	8.5	15	15	15
Earth	500	8.5	15	15	15
Armor Plate	500	5	15	15	15
Earth	500	5	15	15	15
Armor Plate	800	5	15	15	15
Earth	800	5	15	15	15
Total			120	120	120



30mm Ranging Test Matrix

- 30mm TPDS-T SDZ Test Requirement – 10 Valid Ricochets per Test Event

	Gun Super Elevation Angle (deg)	Temp Condition of Ammo (°F)	ATK (Rds Fired)	GD-OTS (Rds Fired)	NAMMO (Rds Fired)
	5	-25	15	15	15
	5	+125	15	15	15
	25	+125	15	15	15
	5	+70	15	15	15
Total			60	60	60



30mm MK310

Ranging Test Results

- 30mm MK317 TPDS-T Data by Manufacturer

Data Parameter	(ATK)	(GD-OTS)	NAMMO
Avg MV (m/s) (5°SE, +70°)	1632.5	1603.9	1490.6
MV SD (m/s)	8.8	6.88	3.02
Avg Range (m) (5°SE, +70°)	6542.5	4942.9	4544.8
Avg ToF (sec) (5°SE, +70°)	15.9	13.2	12.9
Max Range (m) (24°SE, +125°)	7613.8	6854.8	8416.5
Avg ToF(sec) for Max Range	25.6	33.3	36.1

Note: MV SD – Muzzle Velocity Standard Deviation; Avg ToF – Average Time of Flight, SE – Gun Tube Super Elevation



30mm MK317TPDS-T SDZ Results

30mm MK317 TPDS-T Data by Manufacturer

Manufacturer	Range (m)	Avg Impact Velocity (m/s)	Impact Velocity SD	Avg Impact ToF	Impact Time SD
ATK	500	1447	16.8	0.327	0.023
	800	1346	16.1	0.538	0.018
GD-OTS	500	1349	15.6	0.340	0.017
	800	1193	28.4	0.575	0.014
NAMMO	500	1388	5.4	0.344	0.006
	800	1331	6.3	0.561	0017



Summary of SDZ & Ranging Test

- 30mm TPDS-T SDZ and Ballistic Ranging Data Has Been Submitted US Army Aeroballistics Branch, ARDEC for SDZ Analysis and Final SDZ Report
- All three Manufacturers Provide TPDS-T Variants that Meet SDZ Requirements Based upon Preliminary Data
- Three Other Qualified Manufactures will Provide Competition with the Current Single Qualified MK317 TPDS-T Cartridge Made by RWM-S



Future Plans

- Current Plans for USMC & NATO Qualification – On Hold Due to Cancellation of EFV Program
- USMC Is In Process of Developing Requirement for the Follow-On Amphibious Combat Vehicle (ACV) Program.
- Completion of the 30mm TPDS-T Qualification will be Based Upon USMC and/or USN Requirement for Realistic Training Ammunition for a 30mm Main Gun

Questions?

