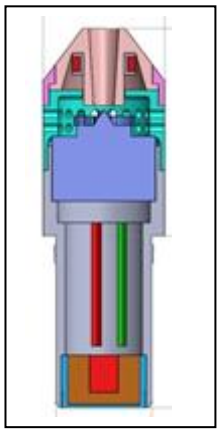
Electronic Fuze for 81 mm Mortar Bomb

A mortar is a weapon that fires explosive projectiles i.e. mortar bombs at low velocities, short ranges, and high-arcing ballistic trajectories. The existing bomb 81mm Mortar HE uses point detonating (PD) fuze which are mechanical of nature and are of second generation. These fuzes uses primary explosive based detonator which are sensitive to heat, friction, shock and EMI/EMC. Moreover they uses complex safety and aligning mechanism.

ESAD technology is being incorporated in fuzing systems for conventional weapons to enhance the safety during storage, transportation and usage. Initiators used are intrinsically safe as they use only comparatively insensitive secondary explosives i.e. PETN, RDX etc. No use of primary explosives in the fuze avoids the need of many complex moving/rotating devices in Safety & Arming mechanisms. Hence TBRL had developed 4th generation Fuze for 81 mm mortar ammunition based on the ESAD technology. The silent feature of the developed fuze are:



1. Electronic time (ET) and Point detonating (PD) Fuze.
2. Compatible with standard fuze well of 81mm Mortar.
3. Passive power source in the form of turbogenerator
4. Contactless inductive programmability of time
5. Barrel and post launch safety
6. Fail safe design

In the designed and developed fuze, Air driven turbo generator is used as power source to initiate explosive train which also acts as safety device. Turbo generator has to operate continuously for certain time period for functioning of fuze thus ensuring barrel and launch platform safety. On receiving power, the control electronics identifies the mode of operations (i.e. PD or ET) and functioning time which was given to the fuze through contactless inductive fuze setter before the launch of the bomb. A hardware delay is also provided to ensure safe separation of ammunition for the launch point. This ensures safety of the firing crew. Commands are issued by control electronics at the pre-set time and given to the firing unit. If the mode of operation selected is PD, the control section senses the impact using accelerometer and initiates the explosive train. Robust and reliable software is developed to carry out the predefined functionality.

EBW detonator will be provided by TBRL at the prevailing cost at that time as the same is not part of development and is a restricted technology.