



Say Goodbye to RF-Exclusion Zones

NEW TECHNOLOGY REDEFINES WELLSITE PERFORATING PRACTICES

For years, selective perforating systems have been armed with resistorized detonators connecting to a mechanical or addressable switch. While this style of detonator is safer than the older non-resistorized electric versions, they can still be susceptible to inadvertent detonation from stray current, voltage, or radio frequency (RF) sources.

As a result of these safety concerns, E&P companies typically suspend wellsite operations while perforating guns are being armed. Radio silence is a common practice when arming guns to minimize the chance of an accidental detonation. This time-consuming process can become costly because no parallel wellsite operations can be conducted during arming. The same is true once guns return to surface. Guns are treated as live devices until initiation can be confirmed, with safe disassembly being conducted in reverse order of the arming sequence. Again, it halts other wellsite activities until the sequence is completed.

As operations become more fast-paced and grow in service intensity, operators are pressing service companies for improved processes that reduce downtime and enable parallel operations at the wellsite. At the same time, reducing the time required to arm each perforating gun is becoming more advantageous. With the proliferation of cell phones and other communication devices, maintaining strict radio silence at the wellsite is proving to be difficult, leading to an even greater safety risk.

API RP 67 FOURTH EDITION

The American Petroleum Institute (API) has proposed an updated version of regulations and safety practices for perforating guns, which is out for ballot. The API RP 67 Recommended Practice for Oilfield Explosives, fourth edition introduces strict standards for safe detonator arming distances away from RF signals.

Three groups of detonators are called out in this edition. Group 1 detonators require RF-exclusion zones while Group 3 "immune" detonators do not. Group 3 detonators function by using high voltage (>500 volts) through exploding foil initiators (EFI) or exploding bridge wire (EBW) technology. As a result, many service providers strive to have their detonators or select fire systems fit into the Group 2 "safe" category.



These require much smaller exclusion zones and are seemingly made safe by attaching an external electronic switch to the resistorized detonator, which provides certain safety aspects with regards to stray current, voltage, or RF sources.

RF-SAFE DISTANCES FROM WELLHEADS

To add another layer of complexity, RF-safe distances are detailed by the Institute of Makers of Explosives (IME) SLP 20 – Safety Guide for the Prevention of Radio Frequency Radiation Hazards in the Use of Commercial Electric Detonators (blasting caps). SLP 20 contains a representative list of transmitter types (ranging from standard AM transmitters and television to CB radio and cell phones) with associated safe distances from over 3,000 feet for AM transmitters down to 5 feet for cellular signals. The majority of service-intensive wellsite operations take place within 100 feet of the wellhead, making it desirable to arm, test, and service perforating guns within this radius.

DYNASTAGE PERFORATING SYSTEM

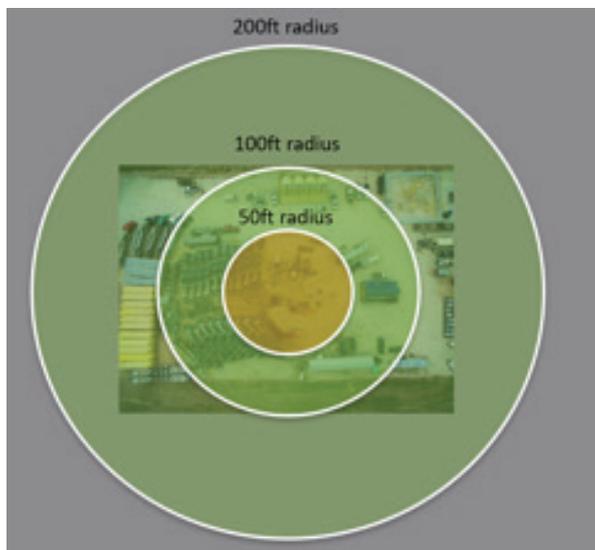
DynaEnergetics has introduced perforating technology that delivers improvements in wellsite safety and efficiency. The DynaStage system removes risks associated with the arming process by providing an addressable and RF-safe system with immunity to high voltage and current levels. It uses the industry's first and only intrinsically safe detonator, making it the preferred choice for operating in hazardous areas like a wellsite.

The wire-free, plug-and-go detonator design is easy to install at the wellsite, requires no on-site wiring, and allows the system to be fully tested before running downhole. The intrinsically safe design of the DynaStage detonator virtually eliminates the minimum safe distance. It also enables parallel well operations without depth restrictions or radio silence. Normal wellsite operations can continue while the gun string is lowered into and raised from the well.

SUMMARY

The new DynaStage electronic system design, classified as a Group 2 "safe" detonator, allows API RP 67-compliant operations while greatly reducing the risk of an unintended detonation at any stage of transport and explosive handling. The intrinsically safe, integrated-switch detonator design minimizes the required safe zone at the wellsite during the arming process and in the post-run rigdown. DynaStage system technology advancements have delivered a perforating gun system that is easier to arm, test, safer to transport and handle, and more efficient to operate.

For more information on the DynaStage system and compliance with API RP 67 fourth edition, download the March 2019 American Oil and Gas Reporter article on DynaStage.com.



Typical wellsite schematic with corresponding distance from wellhead