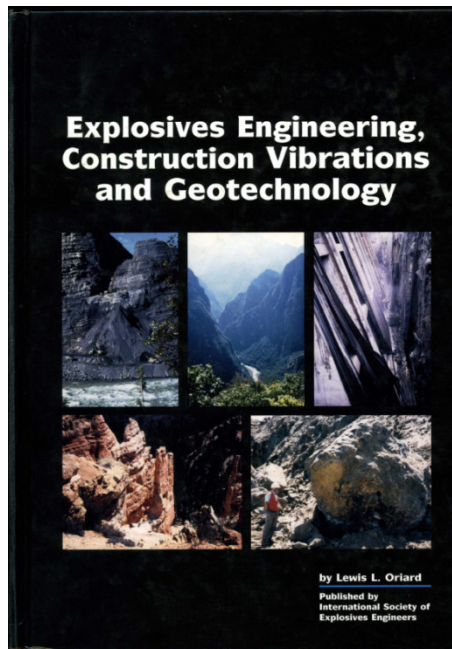


Blasting in or Near Bodies of Water

Rock fragmentation using explosives is accomplished by confining an explosive charge with-in the geology to be broken. When the charge is detonated the geology immediately surrounding the charged drill hole is fractured by initial shock energy. The by products of the rapid detonation combustion (gases) expand the fractures and the geology is displaced in the direction of least resistance (the nearest free face or surface). The displacing material and escaping gases cause a measured impulsive increase to nearby atmospheric pressure (similar but less intensive than a thunder clap).

When explosives are used under water to fragment rock the displacing materials and escaping gases cause a measured impulsive increase in water pressure. These pressures must be controlled to prevent harm to marine life.

When blasting occurs on land in close proximity to bodies of water (or even in shallow waters) ground vibration is communicated through the ground surface to the water. In stark contrast to deep under-water blasting, through his research, Lewis L. Oriard was able to state “ In those cases, questions related to technology and ground vibrations are not much difference from those where there is no water”.

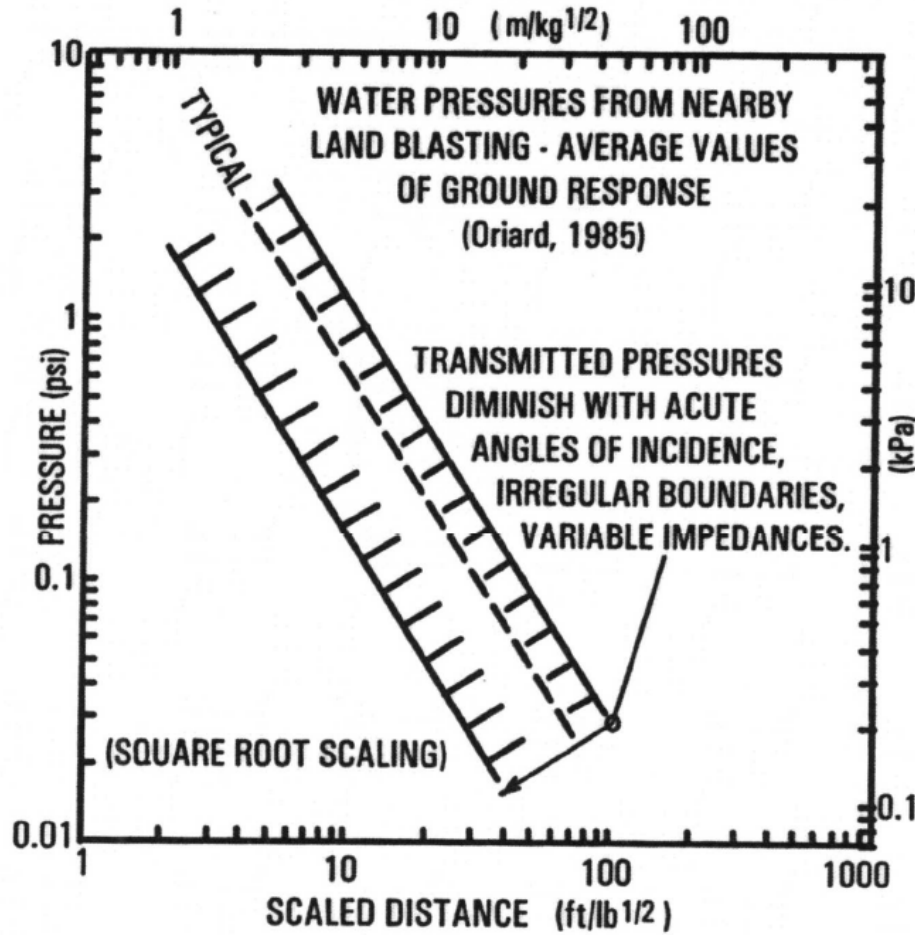


Chapter 7 **Blasting in or Near Bodies of Water**

Most of the construction blasting that takes place under water is done for rock excavation. A second category of consequence is that which takes place for the demolition of concrete or other structures, such as the removal of old bridge piers, modifications of dams, and similar types of underwater construction work.

In some instances, the water is very shallow and may be nothing more than a few inches over a depression in the work area. Equipment and men can sometimes work on the rock surface in water up to several feet deep. In those cases, questions related to blasting technology and ground vibrations are not much different from those where there is no water cover. However, there are important differences when the water is of such depth that drilling must be done from drill barges, and where there are concerns about water pressures impinging on nearby structures, marine life, or even human swimmers. At times there is also a concern over water contamination in the form of rock dust or disturbed silt.

Blasting in or Near Bodies of Water



SD plot illustrating limited
resulting water pressure generation
from nearby land blasting
(L.L. Oriard 1985).

Figure 7-6

(7)