

WEB SITE: [www.simulate-events.com](http://www.simulate-events.com)

## Technical Note No. 46

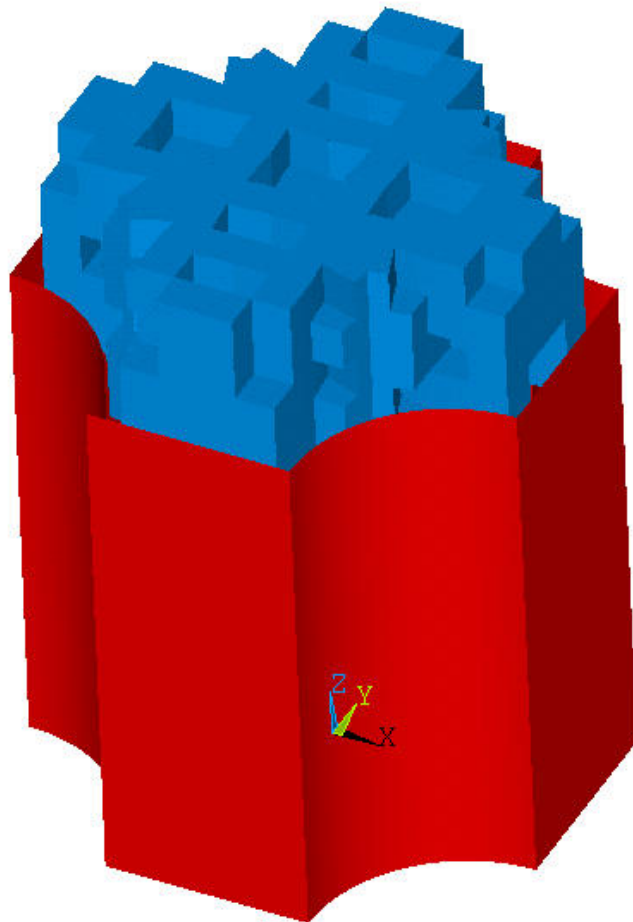
### **BURSTING OF A WATER CONTAINER CAUSED BY A PRESSURE PULSE**

The first picture shows the model of the assembly comprising a container with water inside and a rough-looking rock being dropped into the container and impacting water. (Water is obscured by the other two.) The thin-wall vessel is made of material similar to glass and is about 75% full. The next figure shows the container with water.

The rock impacts the surface of water with a velocity of 30m/s. The pressure pulse generated from this event easily breaks the ceramic container. In Fig.3 the assembly is shown with water bursting past the broken container. In the next picture the container is shown by itself. Finally, in Fig.5 there is water only and the initial outline of the container.

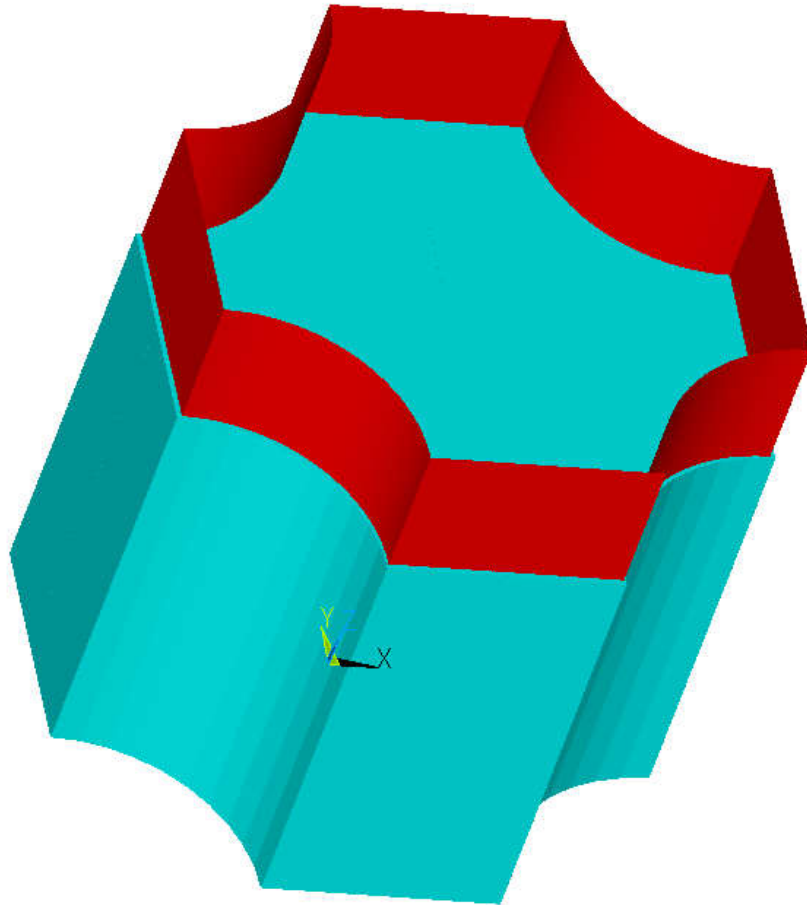
The latest illustrated moment of the event is 40ms since impact. This time is insufficient to show spilling of water over the surface on which the container stands. It would take about 300 ms simulation for the water initially at the top to reach the base surface.

Details: Vessel dimensions, overall, are 600x600 base and 600 mm height. The initial liquid level is up to 450 mm. The walls of vessel are 4 mm thick.



ROCK FALLING INTO OPEN WATER CONTAINER

Fig.1 The assembly. (Water is not visible in this picture)



CONTAINER AND WATER

Fig.2 The container shown filled with water, prior to impact of the rock  
(not visible here)

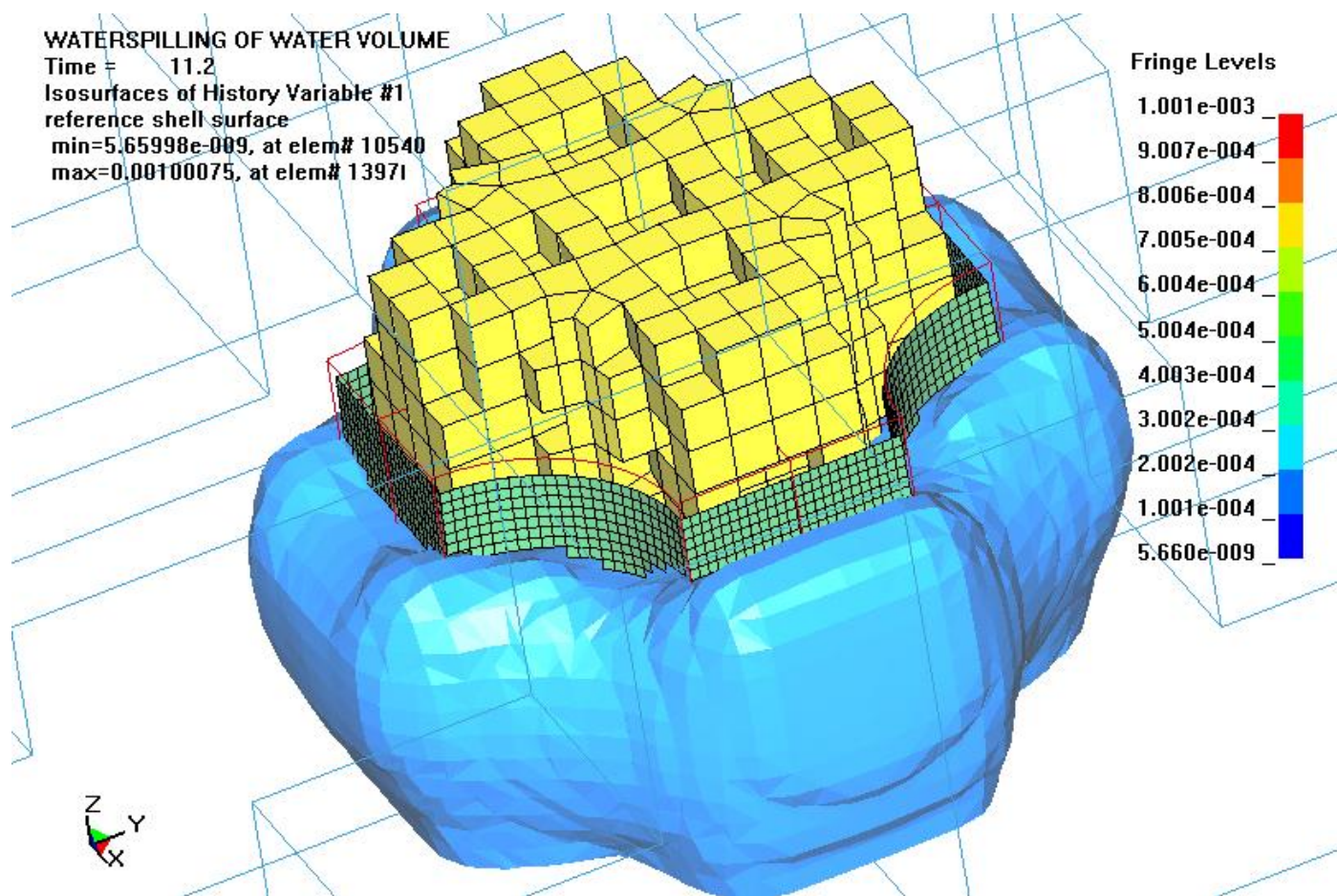


Fig.3 Water bursts through the broken container. (The separate lines belong to the surrounding air volumes.)

WATER CONTAINER BURSTING  
Time = 6.5486  
Contours of Effective Plastic Strain  
max ipt. value  
min=0, at elem# 11423  
max=0.025, at elem# 10909I

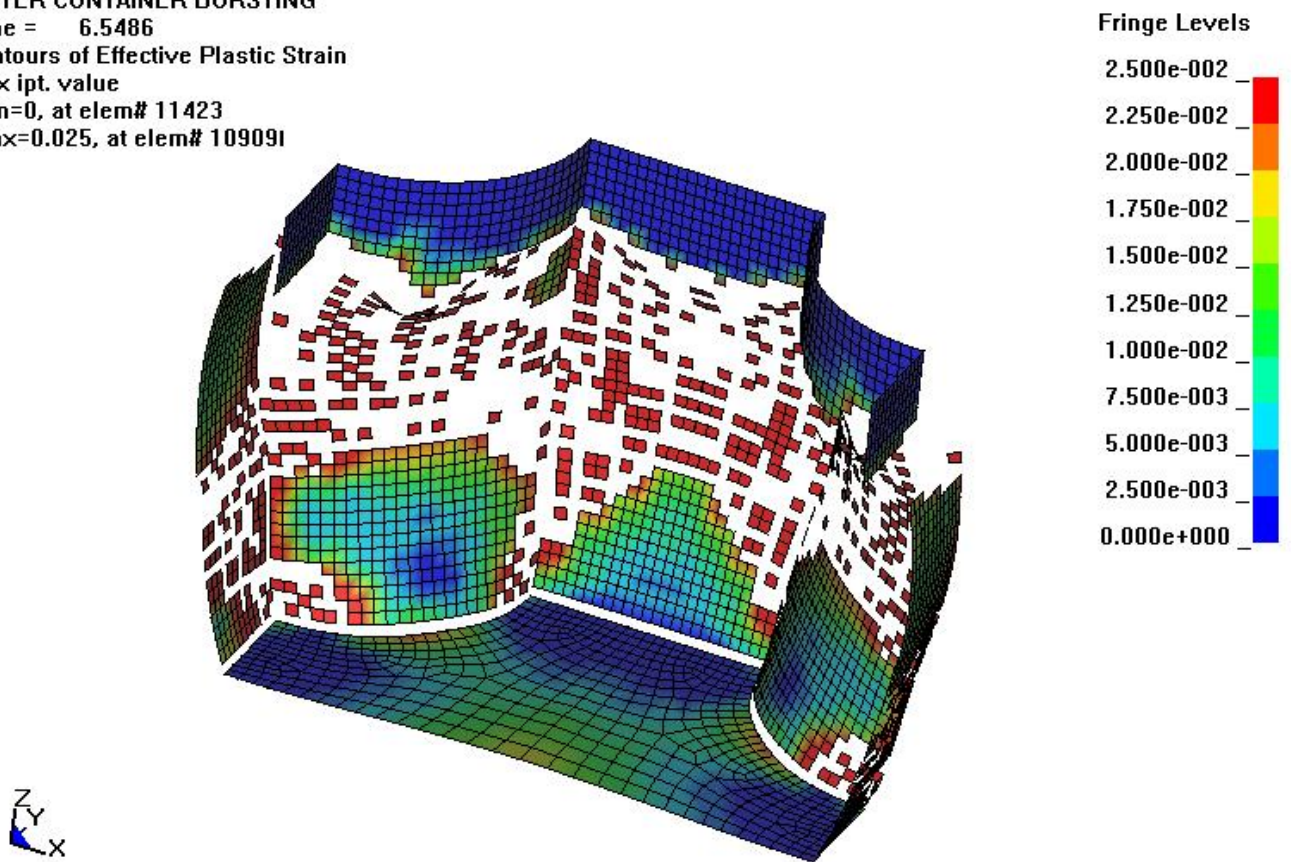


Fig.4 The container is shown by itself, some time after impact.

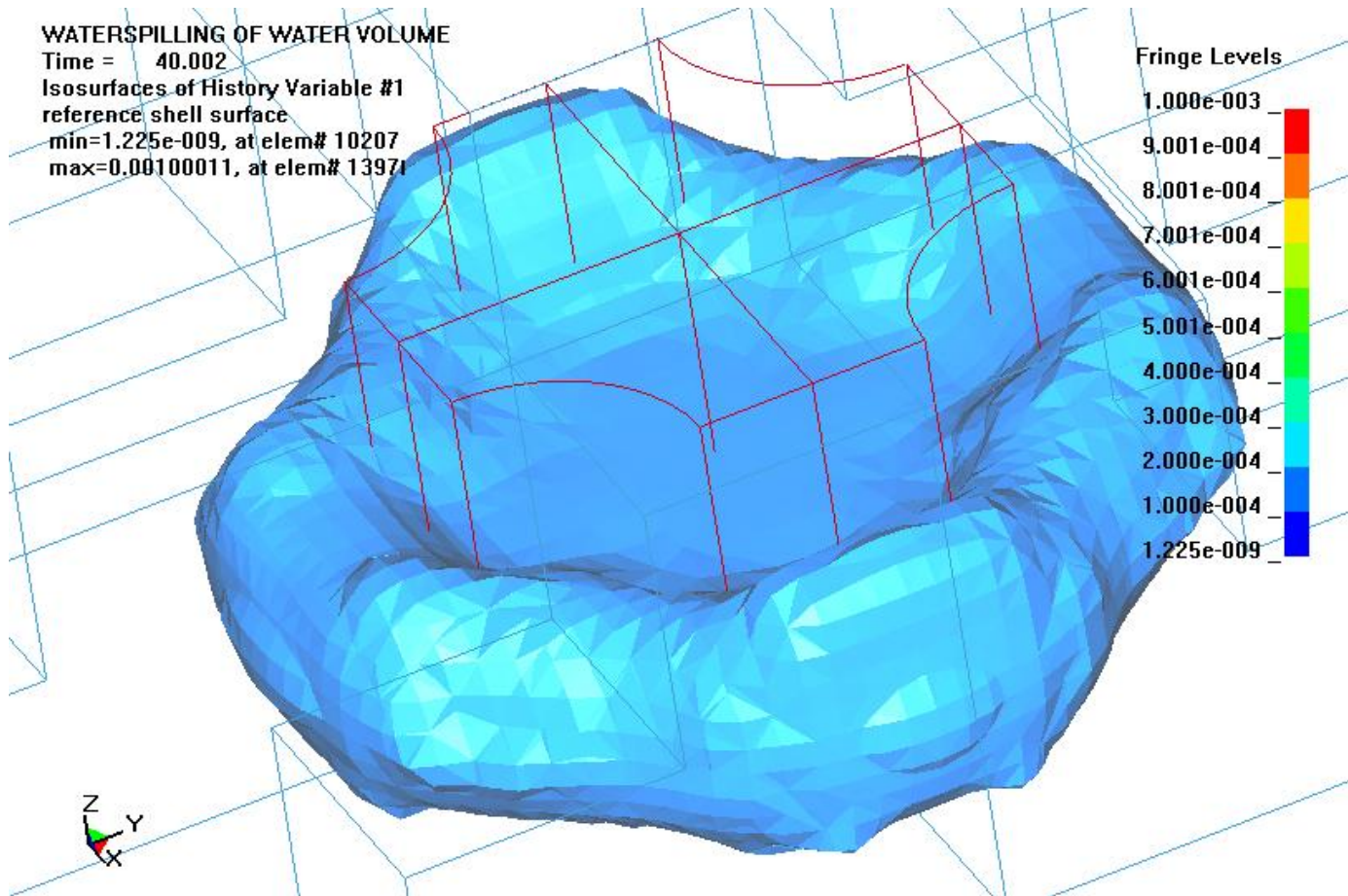


Fig. 5 The water volume shown by itself, some time after impact.