

ANALYSIS OF ACOUSTIC DETECTION OF THE LOSS OF THE ARGENTINE SUBMARINE SAN JUAN By Bruce Rule

An analytical review of all information released by the Comprehensive Nuclear-Test-Ban Treaty Organization on the acoustic signal associated with the loss of the Argentina Submarine ARA SAN JUAN confirms the following:

That acoustic signal originated near 46-10S, 59-42W at 1358Z (GMT) on 15 November 2017. It was produced by the collapse (implosion) of the ARA SAN JUAN pressure-hull at a depth of 1275-feet. Sea pressure at the collapse depth was 570 PSI. The frequency of the collapse event signal (bubble-pulse) was about 4.4 Hz.

The energy released by the collapse was equal to the explosion of 12,500 pounds of TNT at the depth of 1275-feet. That energy was produced by the nearly instantaneous conversion of potential energy (sea-pressure) to kinetic energy, the motion of the intruding water-ram which entered the SAN JUAN pressure-hull at a speed of about 1800 mph.

The entire pressure-hull was completely destroyed (fragmented/compacted) in about 40 milliseconds (0.040s or 1/25th of a second), the duration of the compression phase of the collapse event which is half the minimum time required for cognitive recognition of an event.

Although the crew may have known collapse was imminent, they never knew it was occurring. They did not drown or experience pain. Death was instantaneous.

The SAN JUAN wreckage sank vertically at an estimated speed between 10 and 13 knots. Bottom impact would not have produced an acoustic event detectable at long range.

The open question is: why was no corrective action - such as blowing ballast - taken by the SAN JUAN crew before the submarine sank to collapse depth? According to Argentine Navy spokesman Gabriel Galeazzi, the Commanding Officer of the SAN JUAN reported a "failure" in the submarine's "battery system," The time of that report was 0730 on 15 November, assumed to have been GMT. Subsequently, the problem was reported to have been "fixed." The SAN JUAN intended to submerge and continued its transit north. The SAN JUAN pressure-hull collapsed at 1358 GMT on 15 November.