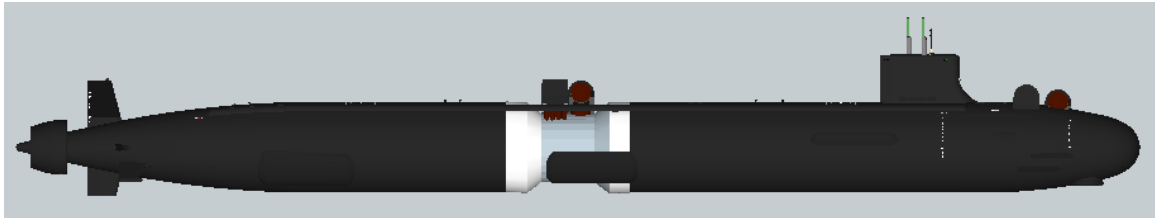


Stretch Virginia – an Alternative to the Virginia Payload Module

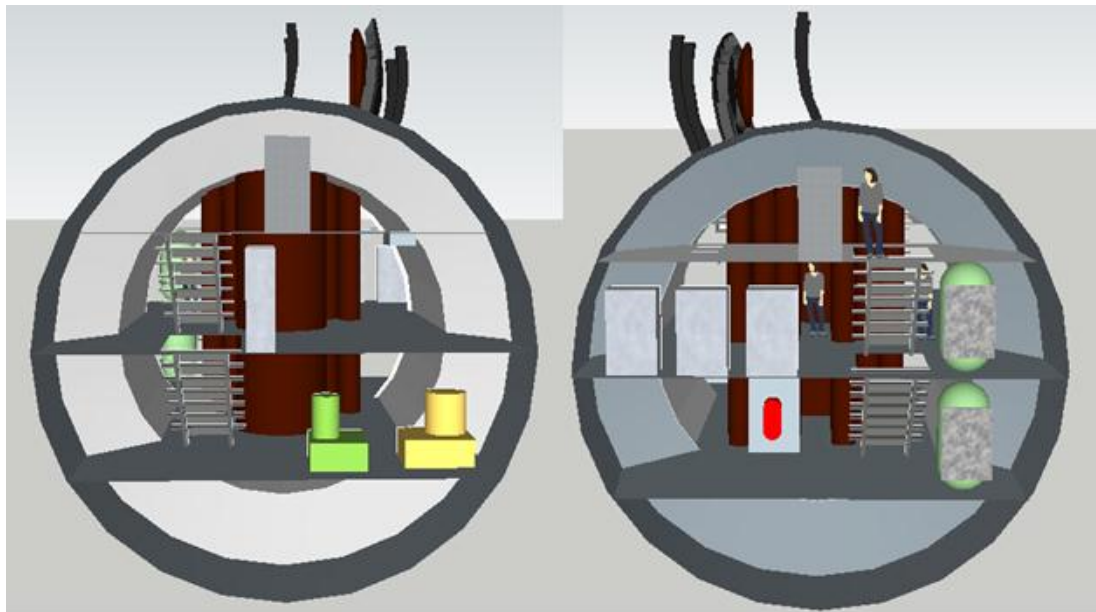
LT Adam Jones, USN; CDR Terry Nawara, USN; LT Damian Oslebo, USN

In 2011, Electric Boat revealed concept designs for a Virginia Payload Module (VPM). Electric Boat states the VPM will have “four additional large-diameter payload tubes in a module inserted amidship...extending the hull by 94 feet and increasing the fixed strike capacity by more than 230 percent per ship.” Each large diameter tube can store seven Tomahawk missiles, support Special Operations Forces (SOF), or support prompt global strike missions. This paper will present an alternative to the VPM (termed “plug”). The goals in designing the plug were to minimize changes to the original Virginia class submarine, maintain the same mission capabilities as the VPM, and reduce its length to improve maneuverability and hydrodynamics while increasing the strike capability per foot added. The final result was a 47 foot plug with one large-diameter tube and 22 individual missile tubes that each contains one Tomahawk missile (or other possible 21 inch diameter payloads). By maintaining one large diameter tube, the plug can support the SOF and prompt global strike missions. The plug can be loaded with a total of 29 Tomahawk missiles, which is one more missile than the concept design for VPM.

Characteristic	Value
Length	424 feet (377 ft baseline plus 47 ft plug)
Additional Missile Tubes	29 Total (7 in MAC plus 22 VLS)
Cost	Less than 10.2% above baseline Virginia
Speed Reduction	Less than 5% from Virginia
Additional Personnel	None
Additional Systems	Cooling System (EAFW), Hydraulic System, Weapon Launch Console, Electric Switchboards, 2 Air Flasks, 2 Fans, Fire Hose
Technology Risk	Disposable VLS Pressure Caps



Profile View of Plug with Baseline Virginia (Plug's Hull Fairing Not Shown)



Forward Looking Aft

Aft Looking Forward