Venus Atmospheric Maneuverable Platform (VAMP). R. Polidan[1], G.Lee[1], D. Sokol[1], K. Griffin[1], and L. Bolisay[2], [1]Northrop Grumman Aerospace Systems, [2]L'Garde, Inc.

Over the past years we have explored a possible new approach to Venus upper atmosphere exploration by applying recent Northrop Grumman (non-NASA) development programs to the challenges associated with Venus upper atmosphere science missions. Our concept is a low ballistic coefficient (<50 Pa), semi-buoyant aircraft that deploys prior to entering the Venus atmosphere, enters the Venus atmosphere without an aeroshell, and provides a long-lived (months to years), maneuverable vehicle capable of carrying science payloads to explore the Venus upper atmosphere. VAMP targets the global Venus atmosphere between 55 and 70 km altitude and would be a platform to address VEXAG goals I.A, I.B, and I.C.

We will discuss the overall mission architecture and concept of operations from launch through Venus arrival, orbit, entry, and atmospheric science operations. We will present a strawman concept of VAMP, including ballistic coefficient, planform area, percent buoyancy, inflation gas, wing span, vehicle mass, power supply, propulsion, materials considerations, structural elements, subsystems, and packaging. The interaction between the VAMP vehicle and the supporting orbiter will also be discussed. In this context, we will specifically focus upon four key factors impacting the design and performance of VAMP:

1. Science payload accommodation, constraints, and opportunities
2. Characteristics of flight operations and performance in the Venus atmosphere: altitude range, latitude and longitude access, day/night performance, aircraft performance, performance sensitivity to payload weight
3. Feasibility of and options for the deployment of the vehicle in space
4. Entry into the Venus atmosphere, including descent profile, heat rate, total heat load, stagnation temperature, control, and entry into level flight

We will discuss interdependencies of the above factors and the manner in which the VAMP strawman's characteristics affect the CONOPs and the science objectives.

We will show how the these factors provide constraints as well as enable opportunities for novel long duration scientific studies of the Venus upper atmosphere that support VEXAG goals I.A, I.B, and I.C.. We will also discuss how the VAMP platform itself can facilitate some of these science measurements.