Enabling Better Shore & Naval Expeditionary Readiness via Networked 3D Virtual Environments

Alex Viana
Naval Facilities Engineering Command (NAVFAC) Headquarters
Alex.Viana@navy.mil

Gerritt Lang
Naval Facilities Engineering and Expeditionary Warfare Center
Gerritt.Lang@navy.mil
Navy Needs

- The ability to preview, plan, program and sustain shore readiness for complex and aging infrastructure and accelerated acquisition of new generation weapon platforms.

- The ability to solve increasing multi-domain and expeditionary combat power and logistics support challenges tied to global shore infrastructure with less time and resources.

Requires timely technical communications between people in disparate locations and from distinct commands.
Increase speed and agility of technical collaboration by utilizing the Extensible 3D open data standard to implement new web-enabled, model-based, real-time 3D communication capability across Naval enterprise networks.

- Leverage existing enterprise IT architecture
- Reuse existing engineering, scientific and geospatial digital data investments
- Be affordable, tailorable and enterprise scalable
- Aligned with DoD digital engineering strategies
SPIDERS 3D Virtual Environments (3DVE) Building Communication Bridges

- IT platform that bridges systems engineering, advance planning, and expeditionary exercises & operations
- Accelerates group learning and knowledge sharing; provides real-time group collaboration with SME’s (operators, planners, engineers, decision makers)
- Adaptable, uses open standard medium to distill various 3D data sources into a common picture
- Affordable, sustainable 3D communication GOTS solution (web-based, no end-user software required)
Integration of Disparate Digital Data

Unlock and integrate wide-ranging data formats into single open standard web-enabled 3D format for multiple uses and collaboration.

Satellite and Aerial Imagery

3D Facility & Infrastructure Models

Topographic and Bathymetric Scans

3D Product Models

Hand-held Laser Scans

www.web3d.org
Geospatial Data Integration

Remote Sensing Data

GIS DEM

3D Virtual Environment Scene

Structure Vector Data

Enabling Naval Shore & Expeditionary Readiness
Enabling Shore Readiness via Improved Systems Engineering Collaboration

Translucent blue model is portal crane travel envelope along the dry dock

Forward starboard side design addition approx. 30 feet from the crane envelope

New design addition aft does not add interference risk with portal crane

Forward portside side design addition is approx. 20 feet from the crane envelope
New Developments for Navy Web-Based 3DVE

- Hand-held LiDAR scanning to produce 3D survey data for visualization
- Integration of component-level condition data into a 3D virtual scene
- Enable access/links to joint forces site-specific data
- System improvements and updates in 2020, including updated 3D model features and 3D printing capabilities
Concept for Expeditionary Readiness
Bases to Places

Rapid 3D data collection from different sources, converted into a 3D scene

Review alternatives real-time across network to speed consensus

Utilize 3DVE to develop operational courses of action
Web-Based 3DVE Value

- Improved technical communications
  - Collaborate real-time and present multi-system operations and site data in an accurate geo-enabled 3DVE
  - Discover and explain spatial issues faster in 3D versus 2D
- Efficiently communicate accurate and scaled site characteristics and decision support data to leadership
- Effectively support rapid and iterative system design reviews and advance planning assessments
  - Networked creativity, agility, acceleration
  - Review concepts, risk, shared knowledge, decisions

Enables decision-makers to quickly optimize tactics, techniques, and procedures