# CASE STUDY: U.S. Navy's NAWCAD Transforms Aircraft Launch and Recovery Systems with Model-Based Definition

## NAWCAD's Legacy Process is Insufficient to Meet Demands of the Defense Industry



Moving complex product data between 2D and 3D environments requires significant time and resources to do multiple cross checks for accuracy. More critically, it creates risk of errors or lost data. It also inhibits an organization's ability to explore iterative enhancements or innovate ideas. This type of design and product development process is insufficient to meet today's industry demands.

Thus, NAWCAD has moved to an MBD environment for their ALRE and SE systems.

The 3D model is a continuous digital thread or single source of truth across the MBD continuum.

1. **Design in CAD system (Creo)**
2. **Document 3D models into an MBD package**
3. **Verfiy 3D design producibility using CADIQ**
4. **Save and manage in PLM system (Windchill)**
5. **Create 3D drawing as PDF**
6. **Check PDF, create STEP**
7. **Analyze and compare models using CADIQ**
8. **Secure the PDF file and send to PMD**
9. **Manufacture the prototype using STEP**

## Overview

NAWCAD Lakehurst is the center of excellence for Aircraft Launch and Recovery Equipment (ALRE) and naval aviation Support Equipment (SE). ALRE refers to the equipment on naval ships used to launch and recover aircraft include catapults, arresting engines, barricades and aircraft visual landing aids currently on aircraft carriers and air capable ships. SE includes the equipment required to test, repair and maintain the aircraft.

The introduction of new aircraft, the need to manage obsolescence issues and engineering investigations constantly drive changes on fleet-deployed ALRE and SE systems. Rapid response to new requirements by organizations like NAWCAD is critical in the defense industry.

Although design at NAWCAD was traditionally done in a 3D environment with Creo Parametric software, the prototype production, manufacturing and validation activities have been managed with 2D engineering drawings.

## Challenges

Moving to a 3D MBD environment requires the conversion of conventional 2D drawings to a 3D digital product definition and means that 3D PDFs containing digital product definition become the single source of data through the product development process.

Engineers who support fleet maintenance activities in an MBD environment need to design replacement parts, new maintenance equipment or new equipment components with increased levels of communication as well as collaboration between engineering and manufacturing personnel and all other project stakeholders. Moving to an MBD process enables improved communication and collaboration across the organization and supply chain.

## Solution

NAWCAD is partnering with industry leaders to formulate an MBD TDP. The TDP will consist of engineering drawing formats that are compatible with the existing 3D PDF (PRC) solution and STEP files that are embedded into these PDF files. A comparison of the Creo models with the new PRC and STEP model files will be conducted to ensure that these models define an identical geometry. CADIQ from ITI will be used to validate 3D product definition at key points in the MBD process.

## Result

The Naval Air Warfare Center Aircraft Division (NAWCAD) of NavAir discovers significant savings opportunities with the move to a model based definition (MBD) approach for technical data package acquisition (TDP).



Because the MBD initiative for ALRE and SE systems will continue to run in parallel with the legacy process at NAWCAD, almost all variables can be compared to the existing ways of doing business. In addition to significant cost savings, the team aims to reduce duplicate work that occurs in the current process; a 33% reduction in new item development schedules is expected. By implementing the MBD process, NAWCAD Lakehurst will realize greater than $3M in annual savings.

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