

Naval Safety Command

Advanced Modeling - Surface



How the Model Works

The Surface model has been developed to use Defense Manpower Data Center (DMDC) manpower personnel data, Navy Energy Usage Reporting System (NEURS) for ship operational information (fuel burn) and Risk Management Information (RMI) safety-related data.

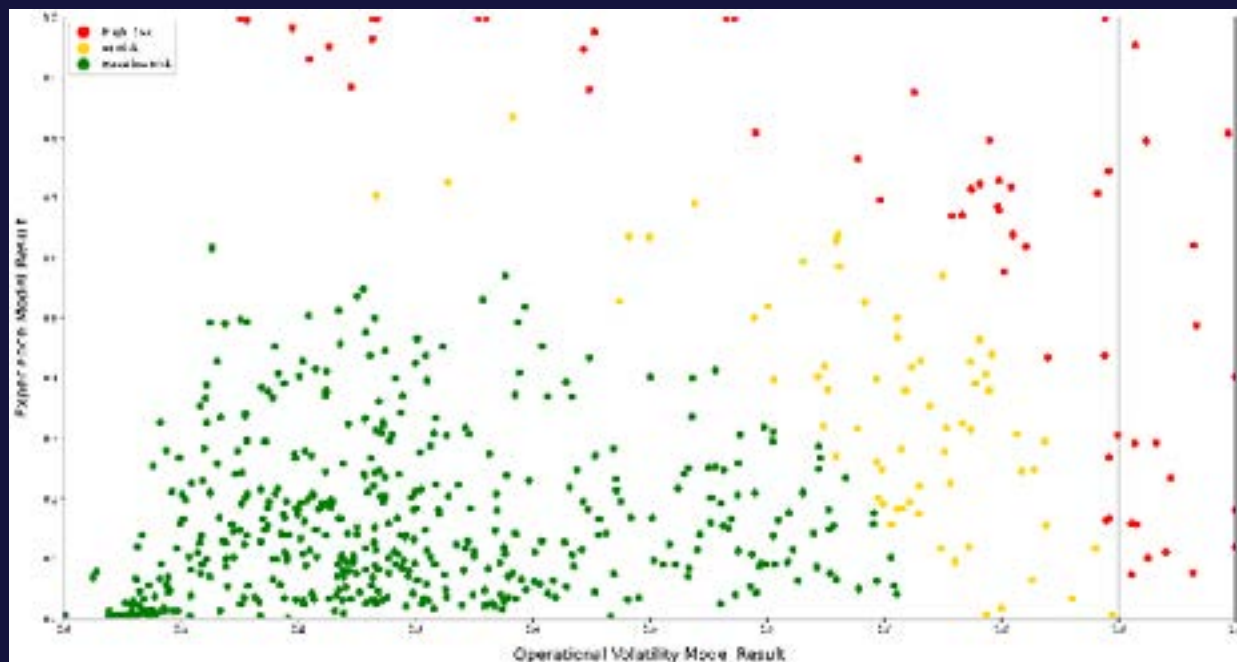
From that data, the model creates a visual representation in the form of a cartesian (X-Y axial) graphical display. The X-axis is referred to as the Operational Volatility axis. It is a summation of unit OPTEMPO (% of days a ship has been underway, DIFFERENTIAL OPTEMPO (month-to-month delta), and CREW VOLATILITY (% of personnel who have rotated into/out of a ship per month over a 12-month period). The Y-axis is the Experience axis and focuses on the total number of days service members based on their binning have been assigned to an operational commissioned ship. The bins for the Y-axis are CO/XO, Wardroom, Senior Enlisted (E8/E9), the Chief's Mess, Senior Enlisted (E6), Junior Enlisted (E1-E5).

What the Model Gives You

Using mishap data from 2012-to current and focusing on Collisions, Allisions, and Groundings, a model has been created (with a second one centered on engineering and maintenance related mishaps). Based on that information, the model will look at each ship using the same characteristics and then determine if ship X is either at a baseline risk (low risk), at-risk, or high-risk. In other words, the model is stating that ship X is either exhibiting no similarities to past mishap units (baseline risk), some similarities (at-risk) or many similarities (high-risk).

On the display, you will see a green dot which correlates to low-risk, a yellow dot which is for at-risk units and then a red for high-risk ships. Each ship will have one dot assigned to it for that month. Note: The lower left-hand corner – the 0-0 origin, is the lowest risk with the upper right-hand corner being the highest risk.

The model does not predict or forecast that a unit will have a mishap. Rather, the model is showing that ship X has the characteristics of a mishap unit. In other words – it is a unit's "check engine" light – a warning to look further into a unit.



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Each month a brief is created highlighting ships attached to USFF or CPF, which looks at Collisions, Allisions and Groundings for one graphical display, followed by a second graphical display focused on engineering and maintenance-related mishaps. The brief will display three graphs per category for the current month and previous two months allowing the user to follow trends from month to month. The model also breaks out in detail what is driving a unit to be at risk or high risk and provides those details for leadership to review and consider.

How to Use the Models

The model indicates how closely current unit level conditions resemble units that have had mishaps in the past. If you find the model agrees with what you *are* tracking, it is an independent verification of what you have already determined. If you find the model indicates a unit you are *not* tracking, you may want to consider taking a closer look at the identified unit. OPTEMPO is normally driven by commitments and is normally not easily adjusted – other mitigations to consider include closer oversight, personnel rotation schedules, or more frequent checks.

Additionally, a near-real-time dashboard is active and is fully selectable (filterable) based on a number of options and is accessible by anyone that has an active Common Access Card (CAC). Visit our Dashboard webpage using the QR code on the right or by visiting <https://navalsafetycommand.navy.mil/On-Duty/Data-and-Analytics/Dashboards/>.



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