Problem

MBDA is a European Prime Contractor for guided weapon systems. In order to plan its portfolio of products for future Domestic and Export markets, information is needed on major platform life expectancy. However, publically available data on platform Out of Service Dates (OSD) is neither available or particularly reliable for many nations.

Solution

Analysis of historical data provides a means of estimating major platform expected lifespan by how long their predecessors have been in service.

An actuarial analysis

The analysis used modified actuarial techniques to generate survival tables for major warships (and other systems). These techniques properly control for members of the population still alive (in active service) at a given age, and allow a spread of uncertainty in OSD to be represented.

System lifespan and your pension

The risk of death over a person’s lifetime is not constant. Pricing of this changing risk is the basis of the insurance and pensions industries.

Likewise, given a warship has survived for a certain number of years, we want to determine how much longer it can be expected to remain in service.

Measuring service life

Data was corrected to derive median service life by class and to control for transfer to other parties and destruction by action or accident.

Study Use

The estimates were used with current orbats to estimate platform OSD and support planning for the future MBDA product portfolio.

Data

Over 50 classes of frigates, destroyers, and light cruisers for UK, France and US in the post WWII period.

Analysis

Both Bayesian and Log-normal risk functions were fitted to survival tables using a maximum likelihood estimator.

Onwards...

MBDA has expanded the analysis to include land platforms, air platforms, and major weapon systems.

Actuarial analysis of warship lifespan

Warship end-of-life

Scrap & reserve

The most common fate of warships beyond OSD is to be decommissioned and scrapped or “rusting in pieces”.

Sale & transfer

Many warships are sold or transferred to allied nations. This also counts for OSD purposes, though the ship may go on to serve for several more decades.

Action & accident

A minority of systems are destroyed in action or lost in accidents. This reduces the median life of vessels in class, and so effects OSD estimates, but is rare.

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