

# Long-tail liability risk management

It's time for a

# scientific

Approach >>>



**Insureware**

Unique corporate culture of innovation

# Do you need to be confident about where your business is heading?

## Get ICRFS™: The world's best long-tail liability risk management system

ICRFS™ is a high-powered analytical and data management system from Insureware. The **only** actuarial software which treats calendar time as an essential feature of its modeling solutions.

The software is:

- small-footprint,
- intuitive and graphic,
- very fast, and
- rapidly implemented enterprise wide!

Designed for the P&C actuary and senior executives, results are delivered in seconds. Take advantage of Insureware's experience and expertise to improve your company's efficiency.

Insureware's team of world-class statisticians originated many of the ideas that the industry now aspires to. They have published numerous papers in actuarial journals and in preeminent statistical journals.



# Your P&C competitor does not want you to have ICRFS™

RISK MARGINS  
LOSS RESERVES  
ACTUARIAL MODERNIZATION  
ORSA  
SOLVENCY II  
REINSURANCE  
IFRS 17



## You would have:

- A single comprehensive system for reserving, pricing, and risk capital calculations
- Automation utilities
- Insight into loss cost trends
- Identify trends and volatility in development, accident and calendar time
- Models that mitigate model specification risk – by design
- Liability stream distributions by calendar period
- Accurate assessment of risk capital
- Reinsurance contracts and reserves net of reinsurance
- Support for Solvency II and IFRS 17 metrics for long-tail liabilities
- A well informed actuarial department

# Accurate and timely metrics critical for your financial decisions?

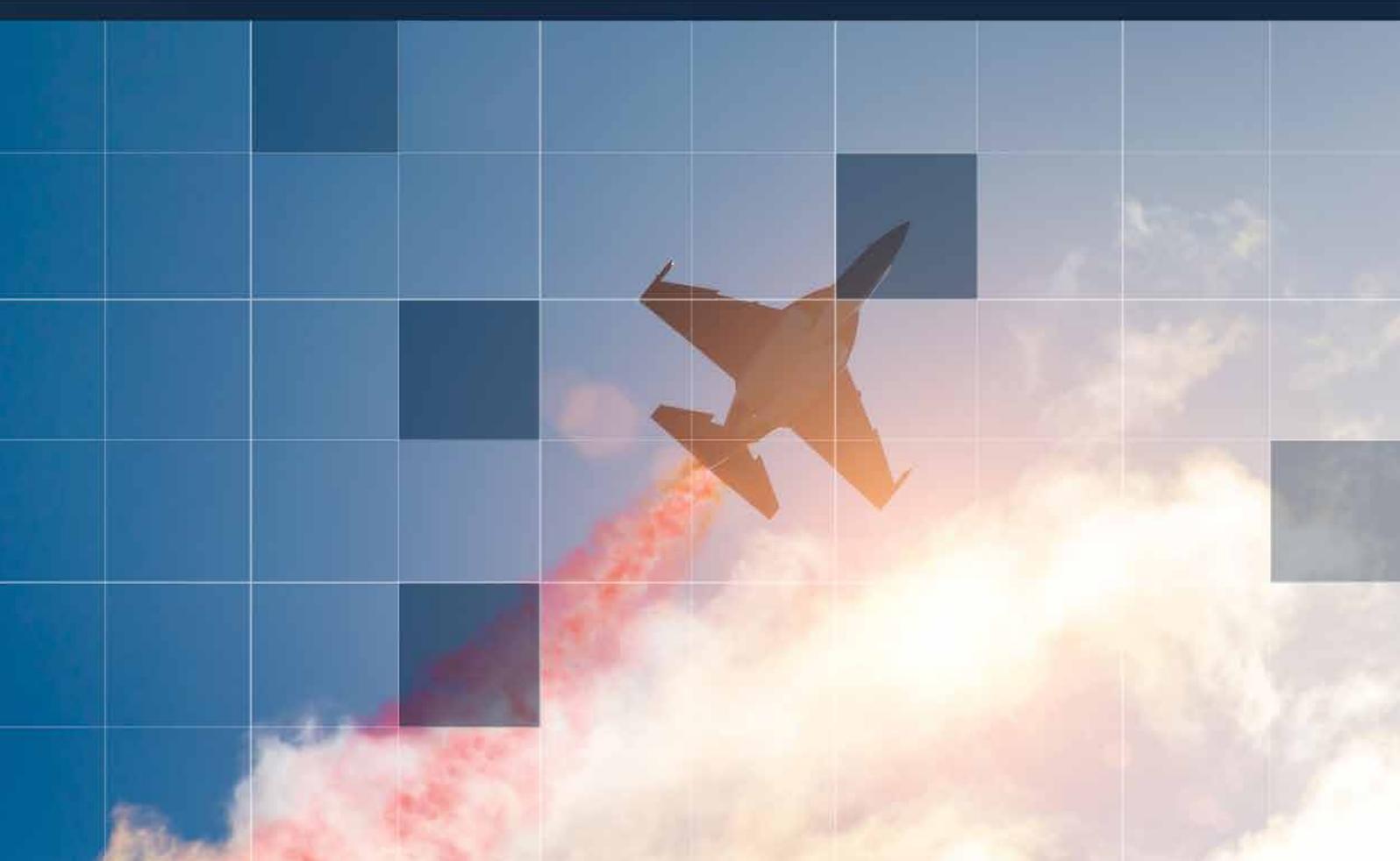
## Time is money; knowledge is power

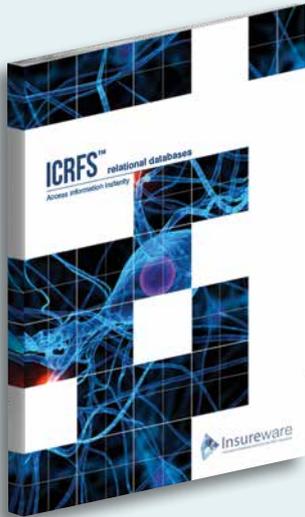
Insurance organizations typically find significant efficiency gains by creating one or more ICRFS™ databases supporting actuarial analytics.

These databases serve as a repository for all aspects of the company's long tail-liability risks. All the information in the database including data, models, and results, are right at your fingertips.

## Modeling Frameworks

The identified models in the Probabilistic Trend Family (PTF) and Multiple Probabilistic Trend Family (MPTF) modeling frameworks describe the trends in the three directions (development, accident, and calendar) along with the volatility around the trends. They provide complete loss distributions by accident period, calendar period, and total.





## Relational databases

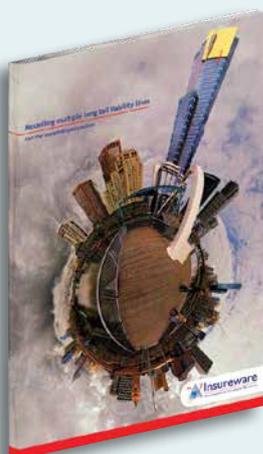
### Access information instantly

- Small footprint
- Fast to implement enterprise wide solution
- Data organized according to your requirements
- Models and forecast scenarios saved in databases
- Simple to navigate
- Easy to monitor, manage, and update

## Link ratios, Mack, Murphy, Over-Dispersed Poisson, and the bootstrap technique

### Do link ratio methods work for your data?

- Introduction to link ratio methods
- Link ratio methods formulated as regression estimators
- The Mack (Chain Ladder) and Murphy methods
- The Extended Link Ratio Family (ELRF)
- The bootstrap technique
- Link ratio methods and correlation
- Comparison with the optimal model in the PTF modeling framework
- Real life case studies!



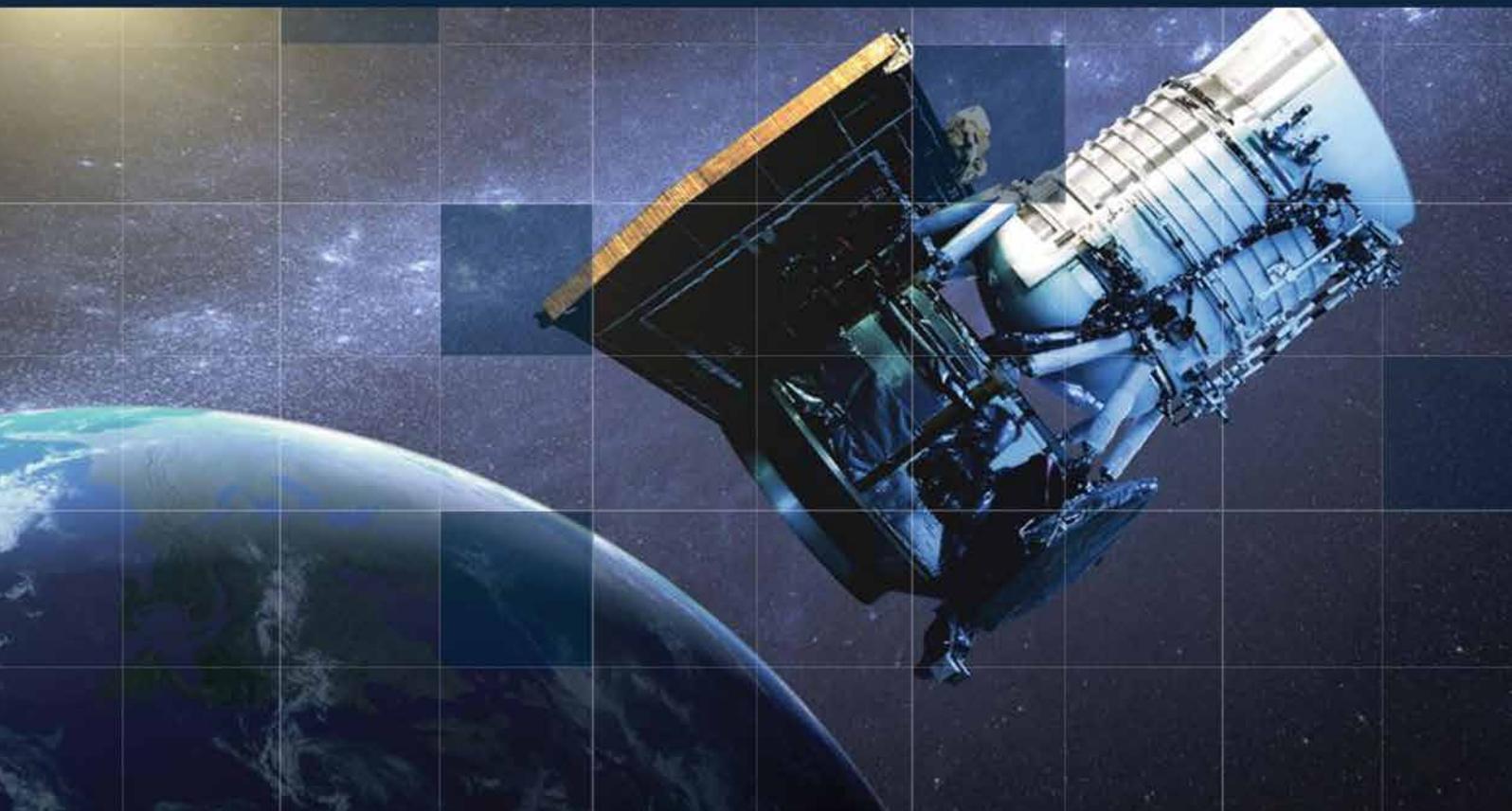
## Modeling multiple long tail liability lines

### Get the complete perspective

- Introduction to probabilistic modeling frameworks
- Common drivers and measuring trends
- Correlations and their impact
- Long-tail liability risk profiles
- One composite model for the whole company
- Aggregate distributions for accident year, calendar year, and totals
- Quantiles (percentiles),  $V@Rs$ , and  $T-V@Rs$
- Economic Balance Sheet and Solvency II metrics
- Real life case studies!

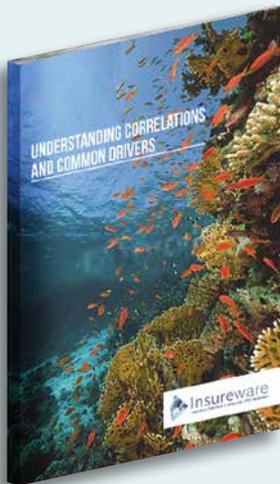
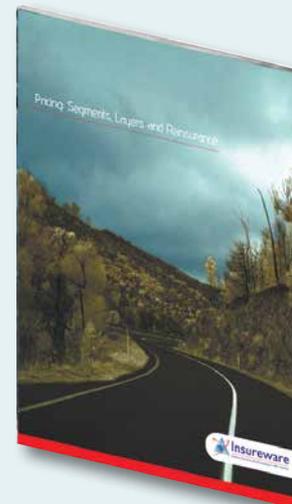
# Mitigate model risk and see your business in a new light?

- Long-tail liability Enterprise Risk Management
- Unparalleled insight and intelligence
- High powered analytics at ludicrous speed
- Structured databases for managing all risks
- ORSA and Solvency II metrics including the Economic Balance Sheet for the aggregate of multiple LoBs
- Single composite model for multiple LoBs
- Multiple aggregation at different levels of segmentation
- Reserve, pricing and reinsurance risk assessments
- Liability distributions and correlations by calendar year
- Risk capital allocation by LoB and calendar year
- Graphical displays of identified models
  - Trends in three directions
  - Volatility about trends
  - Correlations
- Comprehensive model identification and validation tools
- Creative solutions for insoluble problems within a robust, yet flexible, framework
- ... and much more!



## Pricing: Segments, Layers and Reinsurance

- Introduction to probabilistic modeling frameworks
- Pricing future underwriting years including for the aggregate of multiple LoBs
- Pricing segments
- Assessing optimal outward reinsurance
- Layers and High Severity/Low Frequency
- Adverse Development Cover
- Real life case studies!

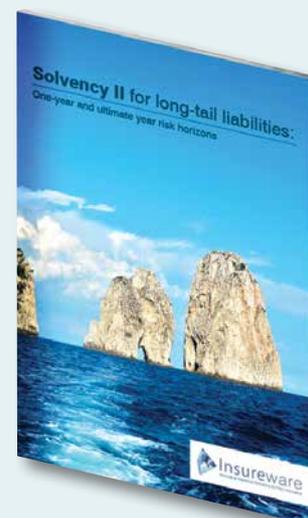


## Understanding correlations and common drivers

- Purpose of correlation measures
- Correlations are model dependent
- Common accident year and calendar year drivers versus correlations
- Impact of accident year drivers on pricing
- Real life case studies!

## Solvency II – one year and ultimate year risk horizons for long-tail liabilities

- Economic Balance Sheet
- Solvency II Capital Requirement
- Technical Provisions
- Market Value Margins
- IFRS 17
- Fungibility and Ring Fencing
- Consistency of metrics on updating
- One year ahead metrics



# Did poor methodology sink Tower Group?



## **Tower Group: a failure in progress since 2007**

- A new calendar year trend that emerged in 2006 was steadily eroding their financial position and culminated in the failure of Tower Group in 2013 when under-reserving was finally noticed.
- What took experts and stakeholders so long to see the problem?
- Statistical models which describe calendar year trends in the data clearly demonstrate Tower Group was sinking way back in 2009!
- Commonly used methodologies do not measure calendar year trends.
- Using the right modeling tools in 2007 could have saved Tower Group. By 2011 it was far too late.

**Find out more at [insureware.com](http://insureware.com)**

# ELRF™ 2023

ELRF™ 2023 is for P&C actuaries requiring traditional and stochastic reserving methods coupled with the power of a relational database.

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**All the information in the database including data, models, and results, are a mouse click away.**

**Accessing data and information through the ELRF™ application is a pleasure.**

**Available in three versions:**

- **Enterprise**
- **Professional**
- **Standard**

**Get your copy today...**

## **Enterprise:**

- Audit logs
- Active directory
- Open ICRFS™ data format
- Extended database support

## **Professional:**

- COM API
- Extended report templates
- Server databases (Oracle & SQL Server)

## **Standard:**

- Link ratio methods formulated as regression estimators
- The Mack (Chain Ladder) method with extensions to an intercept (Murphy) and constant trends
- Bootstrap technique
- Diagnostic tools
- Over 144 link ratio methods

Insureware lets you focus your resources on getting and delivering results – not getting data or manipulating formulae!



**Insureware**  
Innovative Statistical Solutions for P&C Insurance

# ELRF™ Best's Schedule P

Exclusive to Best's Financial Suite - P/C, US subscribers

Insureware and AM Best have created ELRF™ Best's Schedule P. This application, freely available with a Best's Financial Suite - P/C, US subscription, is pre-loaded with Best's Financial Suite - P/C, US data in an ELRF™ structured database primed for Insureware's analytical tools.

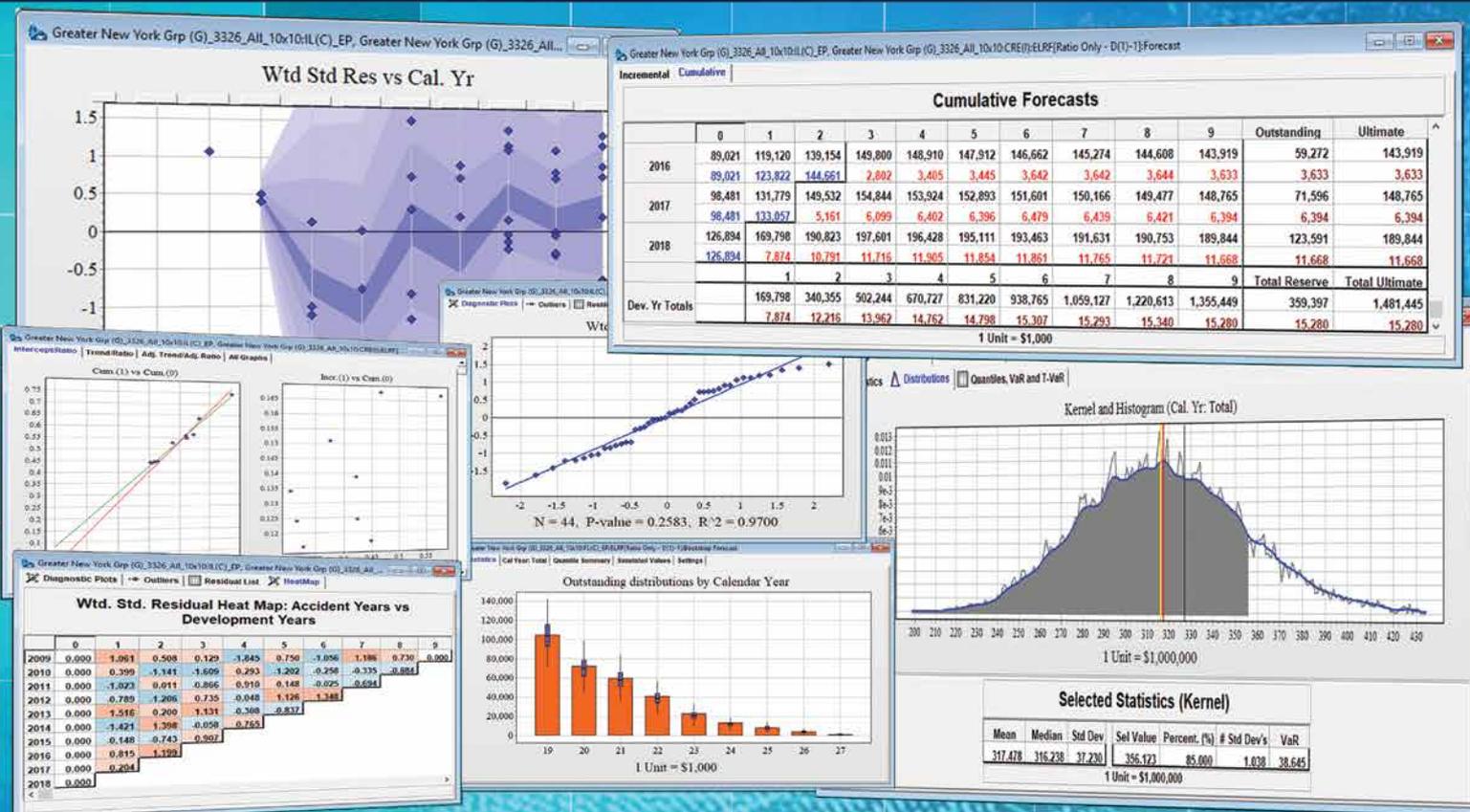
## Structured access to Best's Financial Suite - P/C, US data

Empowered with this application you will obtain:

- Offline access to Best's Financial Suite - P/C, US data and derived financial metrics in an ELRF™ structured database.
- Pre-calculated critical financial information:
  - Reserves Held;
  - %IBNR;
  - Total Loss Ratio;
  - Survival Ratios; and
  - Much more!
- All available Best's Financial Suite - P/C, US triangles:
  - Paid losses;
  - Case Reserve Estimates;
  - Incurred Losses (not including BULK and IBNR);
  - Number of Claims Reported; and
  - Number of Claims Closed.

Construct a complete picture of a company's reported liabilities, their holdings, and their financial positioning in the industry.

## Analytical tools including the Mack method and the bootstrap technique

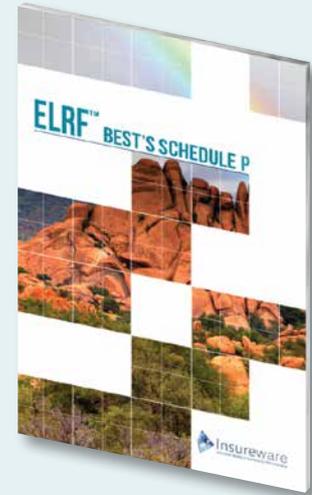


## ELRF™ Best's Schedule P

Exclusive to Best's Financial Suite - P/C, US subscribers

- **Free with a Best's Financial Suite - P/C, US subscription!**
- Offline access to Best's Financial Suite - P/C, US data and derived financial metrics;
- Pre-calculated critical financial information;
- Drill down by classification variables and glean hidden insights;
- Additional Reserves Held and Ultimates Held triangles;
- All analytical tools included in ELRF™!

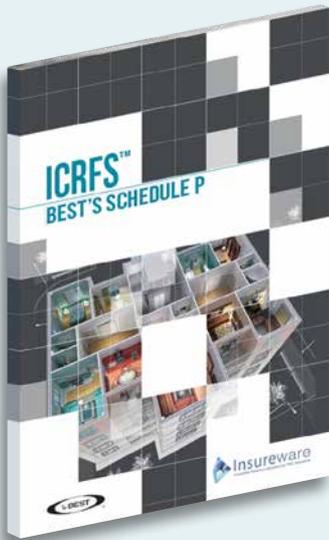
Construct a complete picture of a company's reported liabilities.



## ICRFS™ Best's Schedule P

Exclusive to Best's Financial Suite - P/C, US subscribers

- All of the benefits and advantages of ELRF™ Best's Schedule P, plus;
- Probabilistic Trend Family (PTF) Modeling Framework:
  - Identify trends in the three time directions (development, accident, and calendar);
  - Measure the volatility around the trends; and
  - Compare loss costs between companies and LoBs.
- Multiple Probabilistic Trend Family (MPTF) Modeling Framework:
  - Measure correlation between LoBs driven by the data;
  - Determine risk capital allocation and diversification credit for entire companies; and
  - Much more!



ELRF™ Best's Schedule P is available to all Best's Financial Suite - P/C, US subscribers through BestLink and requires an active Best's Financial Suite - P/C, US subscription for the relevant years. The pre-loaded Best's Financial Suite - P/C, US data includes 20x10 and Net 10x10 arrays.

## About Insureware

Insureware is not your typical long-tail liability risk management firm: we are R&D focused. Our team of world-class statisticians originated many of the ideas that the industry now aspires to. They have published numerous papers not only in actuarial journals but also in preeminent statistical journals. Insureware creates and supports the only comprehensive, enterprise wide, long-tail liability risk management software in the world.

Insureware has advised on a wide-range of insurance matters including:

- Reserve due diligence;
- Mergers and Acquisitions;
- Assessing risk capital and Solvency II capital requirements for submissions to regulators and rating agencies;
- Underwriting and pricing; and
- Reinsurance transactions.

Insureware creates unique collaborative partnerships with each client. The partnership facilitates the growth of incomparable knowledge, benefits, and applications.

[www.insureware.com](http://www.insureware.com)

Email: [info@insureware.com](mailto:info@insureware.com)

Tel: +61 3 9533 6333



**Insureware**  
Innovative Statistical Solutions for P&C Insurance