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**ASR Verzekeringen
Nederland**

To To Whom it May Concern

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ASR and ICRFS - a long-lasting and fruitful marriage...

Insureware Australia, founded in 1988 by Ben Zehnwirth, is the inventor of the ICRFS Software for long-tail liability insurance, facilitating sound management of risk and capital. Mr. Zehnwirth kindly asked me to write a review as an independent user of this software and send this review to you. I am pleased to fulfil this request.

Allow me to introduce myself. I am an actuary, working for ASR Netherlands (and predecessors) since 1973. In 1986 I became the appointed actuary for all Non Life companies in the Netherlands being subsidiaries of the Holding Company, responsible for the formal actuarial certification of the Statutory Technical Provisions. Due to changed regulations of the Dutch Actuarial Association since 2006 internal certification is not permitted anymore and as a consequence taken over by an external actuarial bureau. But this was more or less a formal matter; execution of (preoperational) activities to enable the formal external actuarial certification (more or less by means of peer review) was still my responsibility.

In 2010 I became senior program manager of the Solvency II project ASR Netherlands, in particular responsible for the management regarding collecting and review of the Solvency II Requirements and instructing the project managers responsible for implementation. For many years already I am the ASR representative in the Solvency II Working Party of the Dutch Association of Insurers. However, I still also perform a cooperative coaching role for the Non-Life actuarial team on corporate level.

Our ICRFS experience...

In 1992 ASR enjoyed a first demonstration of ICRFS, when Ben Zehnwirth came along and presented this software package to us. At that moment ICRFS was programmed in DOS. As a consequence not very user-friendly software when compared to the fully graphic-oriented today's version in Windows. However, during the presentation the ASR actuaries became convinced of the outstanding underlying philosophy of this software, which resulted in the first licence end that year.

That was the start of a long-time relationship, lasting for 20 years now. During these years ICRFS became the tool for our companies in the field of Non-Life claims reserving, a tool that definitely has become the marvellous initiator of so many significant developments in Non-Life within ASR, developments that still continue. ICRFS is the basis of our ASR Risk Model Non-Life, which combines very relevant actuarial activities as Adequacy Testing of Liabilities, testing of Portfolio profitability and providing necessary information for the assessment of Economic Capital.

Why has ASR relied on this software for such a long time already? To discuss all possibilities incorporated in this software and the benefits would take many pages. But let me try to summarize a few decisive arguments:

- The complete framework for claims reserving and forecasting it offers.

I would like to emphasize that ICRFS is *not* a methodology. It is a *framework* that contains many actuarial methodologies, including (almost) all traditional deterministic methods, in particular many Link Ratio Techniques. However, it also contains the so-called Extended Link Ratio Family approach, making clear in a regression context if the (implicit) conditions underlying these deterministic methods are valid for the actual observed claims performance and as a consequence these methods could provide reliable and stable results. Unfortunately in my experience verification of these conditions is so often ignored by users of these methods.

Mainly due to generally fluctuating inflationary trends in long-tail business this evaluation often shows that the conditions are not valid and so the obtained results could be highly incorrect and misleading. In past 15 years many theoretical and research papers - even a recent one from Guy Carpenter about the predictive power of the classical Chain Ladder methodology... - have clearly demonstrated the weaknesses of the traditional methods. Actually for me it is really a mystery and hard to understand why so many actuaries still stick to these traditional flawed methods.

But when it is clear that conditions are not valid, ICRFS offers a much more appropriate stochastic approach. The PTF and MPTF modules for me are the heart of ICRFS, enabling on a stochastic basis optimal modelling of claims performance, recognising trends (an unique and essential feature compared to traditional link ratio methods) in the *three important* directions (accident period, development period *and* calendar period) to create adequate models, based on the principle of *parsimony*, that provide an optimal combination of *goodness of fit* with historic observations and *predictive power*. Resulting not only in reliable sound estimated future cash flows, to assess the Best Estimate, but moreover providing important information regarding the volatility in the claims performance, using a Value-at-Risk concept or a Tail variance concept.

Note: the PTF module is principally used for the modelling and forecasting of individual Lines of Business. The MPTF module is capable of combining the individual Lines of Business to an aggregated module, allowing in a statistical way to assess the correlation between them and obtain full insight in the impact of diversification. An absolute necessary option in our coming Solvency II world.

- The speed of performing activities with ICRFS.

It is true that ICRFS, given its rich contents, comes with a learning curve, that is definitely longer than understanding a Chain Ladder But having obtained the necessary knowledge the way ICRFS is programmed and the fully graphical driven modules enables users extremely fast evaluation of historic claims performance, modelling and forecasting. Simulations, for instance to get insight in the volatility, are executed in seconds. The automatic report function facilitates the creation of documentation, reports with all desired contents about the data, modelling specifications and forecasting results in a undisputed speed. Even nowadays ICRFS includes helpful (stochastic based) wizards to get a quick first impression of relevant, possibly optimal models for all your lines of business in a remarkably speed of time.

- The efficiency and flexibility regarding data management and analysing the claims performance.

ICRFS had a very clear database management which contains all relevant information, like all relevant historic data, models created, underlying assumptions, forecasts etc.

Furthermore ICRFS provides an attractive, interactive and fast user-friendly way to analyse the historical data. Analysis, which reveal the relevant incidental and structural trends and randomness around these recognised trends (including insight in the important inflationary trends), giving deeper understanding of the historical claims performance needed to assess reliable assumptions for forecasting.

One other big benefit in this respect is that by the way the database functions users can very easily update their models for a new reporting period, involving very relevant validation procedures, and giving best possibilities to guarantee consistency regarding models and modelling process, which is a highly appreciated feature (not the least by management...) to obtain reliable forecasting results.

- The innovative character of the Insureware Team, the quality of communication and the attitude regarding feed-back of users.

During the years we often were amazed by the release of a new version of the software, providing highly important new features. Sometimes also as a result of received feedback from users. Insureware always has been very open to feedback, sincerely believing that this is an important way of improving the software.

As ASR we have been able to realise a very close cooperation with Insureware. The communication has been outstanding during all the years we have had the privilege to license the ICRFS software, in quality and speed regarding answering questions, in providing help on technical matters etc.

Like the IT department of ASR once said: “software is coming from the other side of the world, but we never experienced such a quality and speed in communication with any other software bureau before...”.

Most recent innovation I would like to mention is a module which enables the calculation of the Solvency II Capital Requirement regarding Reserve Risk. The approach taken is in my view still unique and not found in any other software, but fully reflect *the* most appropriate method to calculate this Reserve Risk. (Using the in Solvency II prescribed Cost of Capital approach.)

Another interesting feature of ICRFS worth mentioning, is the use of the so-called COM facilities. Using these facilities we as ASR created an Interface in order to manage automatically the data input process, the running of the models (once created) and the result output process. Including audit trails as needed for external reviews. (Show me, instead of trust me...)

Using the Com interface requires some experience with VBA to master, but once one is used to the logic and the built-in functions, they are highly effective and efficient.

As said, this review could be extended to many more pages... From this review the reader might get the impression that this user is biased regarding his love for this software. Mea Culpa, but if so, for me this is inevitable. As Non-Life actuary of ASR in the Netherlands for more than 25 years my imagination is failing to think of a life in Non-Life without ICRFS... We are grateful for the wonderful experience ICRFS has offered. It is not surprising that the actuarial colleagues working for ASR in the field of Life regularly showed jealousy, when referring to our beautiful Pacman for the Non-Life actuaries...

Actually I am very pleased to be asked as a mentor in last two years for post-actuarial students at the University of Amsterdam with the task to demonstrate to them the ICRFS software, and teach them the underlying philosophy and methodologies. Hopefully this will also contribute to much more knowledge and experience for new innovative and more appropriate approaches in Non-Life long-tail business and - but for the moment only my dream - to the ultimate death of Chain ladder approaches

Please do not hesitate to contact me if you have further questions about ICRFS.

Kindest regards,

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