

# Igloo Standard Formula

Simplifying the SCR Solvency II calculation

Approximately 60% of the UK market (by premium income, and excluding Lloyd's) use Igloo to support their Solvency II requirements.

Igloo Standard Formula means you always stay current, giving you the flexibility to react to changing market and regulatory demands.

Implementations of Igloo Standard Formula range from single line domestic insurers through to global businesses.

9 of the top 11 UK and 8 of the top 10 European non-life insurers are Igloo users.

Igloo Standard Formula has been implemented within a group structure covering over 60 entities across 18 countries.

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## Simplifying the SCR Solvency II calculation

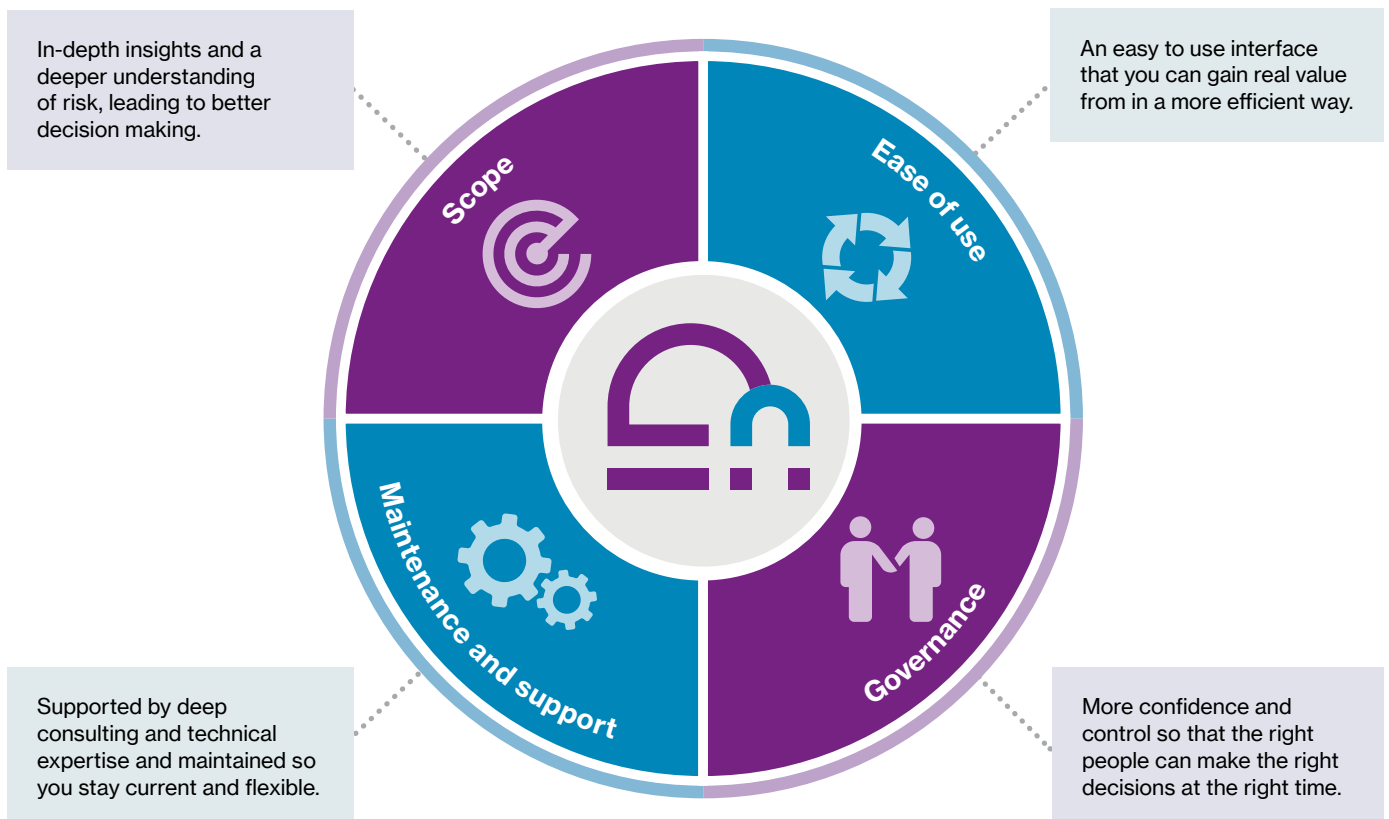
Igloo Standard Formula allows users to quickly see how decisions might impact the risk performance of their business and use model outputs to promote a wider understanding of risk within the business.

Due to its deterministic nature, it would seem at first that the implementation of a standard formula model for Solvency II is relatively unchallenging when compared with the rigours of implementing an internal model, however, this is not always the case. Significant challenges remain, including the need to make timely updates in reaction to any changes to the standard formula and the need for multi-year projections required for the Own Risk and Solvency Assessment. Furthermore these challenges are in addition to ensuring the calculation of the standard formula is robust, efficient and suitably governed.

Igloo Standard Formula directly addresses these issues and challenges by delivering a powerful modelling tool that enables users to reduce complexity, improve governance and provide them with a much deeper understanding of risk within their organisations. This in turn allows for better decision making and enhanced overall business performance.

Drawing upon deep industry and domain expertise, we provide comprehensive support to all of our clients beginning with the implementation and installation of the software, right through to support with calculations, peer review and user training.

Figure 1. Key attributes of Igloo Standard Formula



## Scope

The comprehensive scope of Igloo Standard Formula means it provides in-depth insights and a deep understanding of risk, leading to better decision making.

The scope of Igloo Standard Formula includes:

- Complete representation of the Solvency II standard formula.
- Modular approach covering all risks and sub risks as set out in the Solvency II regulations – covering non-life, life and health calculations.
- All 'helper tab' calculations and material 'simplifications' codified into the software.
- Aggregation of group structures, enabling the user to select any combination of insurance entities for combination.
- Ability to calibrate Undertaking Specific Parameters (USPs) within the tool.
- Access to all underlying parameters to enable scenario testing to be undertaken.
- Ability to undertake projections of future Solvency Capital Requirements (SCRs) and consider alternative scenarios.
- Population of relevant SCR and Minimum Capital Requirement (MCR) Quantitative Reporting Templates (QRTs).
- Extensive, detailed reporting at multiple levels of granularity.

Figure 2. Life, non-life and health calculations are incorporated

The screenshot shows a software configuration window with the following sections:

- Participant:** ABC
- Include Sub-Entity Consolidation?**
- As at date:** 31/12/2018
- Reporting Units Label:** Thousands
- Reporting Currency:** EUR
- Parameter Set Used:** EIOPA Standard Parameters
- Relevant LW Risk Categories:**
  - Non Life
  - Life
- Relevant Non Life Technique LoBs:**
  - Motor Liability
  - Other Motor
  - MAT
  - Fire & other damage to property
  - General Liability
  - Credit & Suretyship
  - Legal expense
  - Assistance
  - Miscellaneous
  - Medical Expense
  - Income Protection
  - Workers' Comp
  - Non-prop. Property RI
  - Non-prop. Casualty RI
  - Non-prop. MAT RI
  - Non-prop. Health RI
- Relevant Geographical Areas:**
  - Northern Europe
  - Southern Europe
  - North-east US
  - Southern Africa
- Relevant Countries for EEA Cat scenarios:**
  - United Kingdom
  - Republic of Ireland
  - Malta
  - Spain

At the bottom, there are tabs for: Globals, Multi-Entity Consolidation, Non-Life Underwriting, Health Cats, Market Risk, Counterparty Default, Intangible Risk, Other SCR Adjustments, and Operational Risk.



Figure 3. Helper tabs are integrated into the calculation

| Single Named Exposure    | Counterparties | Exposure Type      | Credit Quality Step | Requirements Met?                   | Solvency Ratio | >60% Tied up?                       | Risk Mitigation Method | Collateral Method | Relevant LoB    | Collateral Requirements Satisfied | F    | Collateral Market Value | Collateral Mkt Risk | Recoverables | RI Premium | Share of Cat Risk | Market Value | Risk Mitigation Effect | Amount  |
|--------------------------|----------------|--------------------|---------------------|-------------------------------------|----------------|-------------------------------------|------------------------|-------------------|-----------------|-----------------------------------|------|-------------------------|---------------------|--------------|------------|-------------------|--------------|------------------------|---------|
| Single named exposure 1  | cp1            | R/SPV Securitisati | 0                   |                                     |                |                                     | Manual Inpu Simple     |                   | Motor Liability | Counterparty a                    | 100% | 9,902                   |                     | 5,378        |            |                   |              | 7,689                  |         |
| Single named exposure 2  | cp2            | R/SPV Securitisati | 1                   |                                     |                | <input checked="" type="checkbox"/> | Non-Life Forn Simple   |                   | Motor Liability | Counterparty a                    | 100% | 3,653                   |                     | 559,982      | 29,458     | 48,657            |              |                        |         |
| Single named exposure 3  | cp3            | R/SPV Securitisati | 1                   |                                     |                | <input type="checkbox"/>            | Non-Life Forn Simple   |                   | Motor Liability | Counterparty a                    | 100% | 795                     | 6,479               | 153,735      |            |                   |              | 7,691                  |         |
| Single named exposure 4  | cp4            | R/SPV Securitisati | 2                   |                                     |                | <input type="checkbox"/>            | Non-Life Forn Standard |                   | Motor Liability | Counterparty a                    | 100% | 6,239                   | 6,426               | 680,930      | 9,983      | 58,469            |              |                        |         |
| Single named exposure 5  | cp5            | R/SPV Securitisati | 4                   |                                     |                | <input type="checkbox"/>            | Non-Life Forn Standard |                   | Motor Liability | Counterparty a                    | 100% | 7,199                   | 3,457               | 813,666      |            |                   |              | 7,693                  |         |
| Single named exposure 6  | cp6            | Derivative         | 5                   |                                     |                |                                     | Manual Inpu Standard   |                   |                 | Counterparty a                    | 100% | 6,717                   | 1,772               |              |            | 848,615           |              | 7,694                  |         |
| Single named exposure 7  | cp7            | Mortgage/Other Re  | 6                   |                                     |                |                                     | Manual Inpu Standard   |                   |                 | Counterparty a                    | 100% |                         |                     |              |            |                   |              |                        | 248,615 |
| Single named exposure 8  | cp8            | R/SPV Securitisati | Other Unrated       | <input checked="" type="checkbox"/> | 100%           | <input type="checkbox"/>            | Manual Inpu Standard   |                   |                 | Counterparty a                    | 100% | 1,969                   | 1,086               | 559,991      |            |                   |              | 7,696                  |         |
| Single named exposure 9  | cp9            | Cash at Bank       | Unrated Bank        |                                     |                |                                     | Manual Inpu Standard   |                   |                 | Counterparty a                    | 100% |                         |                     |              |            |                   |              |                        | 842,292 |
| Single named exposure 10 | cp10           | R/SPV Securitisati | Other Unrated       | <input type="checkbox"/>            |                | <input type="checkbox"/>            | Manual Inpu Standard   |                   |                 | Counterparty a                    | 100% | 1,207                   | 2,982               | 37,207       |            |                   |              |                        | 5,949   |



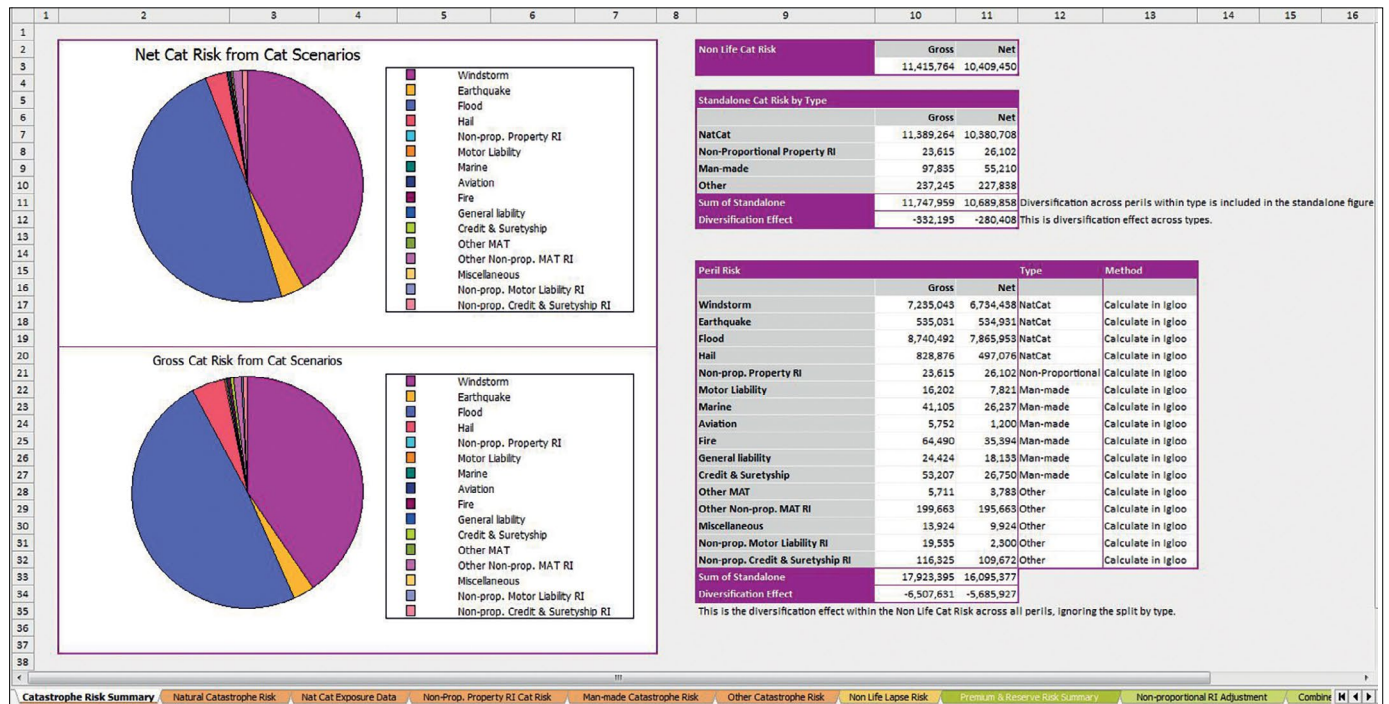
## Ease of use

**Igloo Standard Formula allows you to derive real value from its use in a smarter, more efficient manner.**

- **Reduced complexity** – Provides facilities to remove or hide functionality, inputs and outputs that are not required to simplify the calculation process.
- **Drill down** – Offers market leading facilities to drill down into the calculation, highlighting important intermediate results and providing significant insights into the drivers of the SCR.

- **Integrated documentation** – Reference context sensitive elements of the technical specification documents for the SCR, MCR and Own Funds calculations easily by hovering over specific inputs or results.
- **Streamlined user interface** – With data input, calculation and reporting all combined into the powerful Igloo platform it allows quick ‘what if?’ and sensitivity analysis without an onerous governance burden or the need to switch between applications.

Figure 4. User friendly reports drill into detailed results



## Model governance

Better governance means more confidence and control in how your data is being used and to make sure key information is being seen by the right people at the right time.

Governance of the data submitted to the model and accountability for any changes made are key requirements of the Solvency II framework. Igloo Standard Formula includes the optional Data Control Component (DCC) developed for the wider Igloo suite to provide highly effective control and governance of all inputs and outputs including sign off and comparison of data and results. It also supports direct connection to corporate data systems, ensuring a clear provenance for all parameters and results.

## Maintenance and support

Igloo Standard Formula is supported and maintained by deep industry consulting expertise and technical specialists who can ensure you are getting the most out of the product.

- Igloo Standard Formula helpline** – Our user helpline provides fast and expert advice in the use and deployment of the software.
- Consulting advice** – Should consulting advice be required around the application or interpretation of the standard formula, we offer market-leading expertise and advice that is tailored to your own specific requirements.
- Managed software updates** – Igloo Standard Formula is fully supported and maintained by us. We will provide timely updates to accommodate any changes made by the European Commission either to the standard formula parameters or to the calculation logic.
- Changes in standard parameters** – Users can adjust the underlying model assumptions and parameters. This allows the business to test the impact upon the standard formula SCR of changes proposed by EIOPA or to undertake stress tests.
- Seamless upgrade path** – The standard formula calculations can easily be integrated with other Igloo models.

Figure 5. The web based interface of the Data Control Component

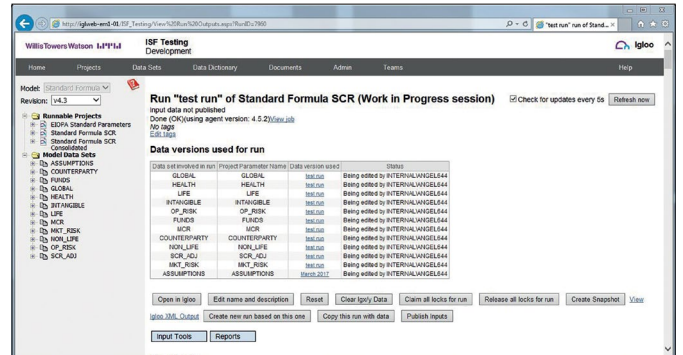


Figure 6. Context sensitive technical documentation

|    | 1  | 2     | 3           | 4  | 5           | 6     | 7           | 8     | 9           | 10    | 11          |
|----|--|-------|-------------|--|-------------|-------|-------------|-------|-------------|-------|-------------|
| 60 | Non-call Risk Transfer Currency Swap Risk  |       |             |  |             |       |             |       |             |       |             |
| 61 | Non-Life 1,500 Please ensure that reinsurance amounts are not greater than the corresponding gross amounts |       |             |  |             |       |             |       |             |       |             |
| 62 | Non-SCR Health 1,500   |       |             |  |             |       |             |       |             |       |             |
| 63 | Provision Data   |       |             |  |             |       |             |       |             |       |             |
| 64 | Reinsurance Data   |       |             |  |             |       |             |       |             |       |             |
| 65 | Earned   |       |             |  |             |       |             |       |             |       |             |
| 66 | Next Year (Plan)   |       |             |  |             |       |             |       |             |       |             |
| 67 | Later Years (Plan)   |       |             |  |             |       |             |       |             |       |             |
| 68 | Motor Liability  | Gross | Reinsurance | Gross  | Reinsurance | Gross | Reinsurance | Gross | Reinsurance | Gross | Reinsurance |
| 69 | Other Motor  | 928   | 99          | 237  | 6           | 312   | 89          | 218   | 12          |       |             |
| 70 | MAT  | 484   | 67          |  |             |       |             |       |             |       |             |
| 71 | Fire & other damage to property  | 764   | 8           | Article 116<br>Volume measure for non-life premium and reserve risk  |             |       |             |       |             |       |             |
| 72 | General liability  | 877   | 71          | 3. The volume measure for premium risk of a particular segment s shall be equal to the following:  |             |       |             |       |             |       |             |
| 73 | Credit & Partnership   | 140   | 33          | $V(\text{prem}, s) = \max(P_s, P(\text{act}, s)) - P(\text{future}, s) - P(\text{future}, s)$  |             |       |             |       |             |       |             |
| 74 | Legal expense  | 99    | 87          | where:   |             |       |             |       |             |       |             |
| 75 | Assistance   | 405   | 85          | (a) $P_s$ denotes an estimate of the premiums to be earned by the insurance or reinsurance undertaking in the segment s during the following 12 months;  |             |       |             |       |             |       |             |
| 76 | Miscellaneous  | 41    | 15          | (b) $P(\text{act}, s)$ denotes the premiums earned by the insurance or reinsurance undertaking in the segment s during the last 12 months;   |             |       |             |       |             |       |             |
| 77 | Medical Expense  | 28    | 11          | (c) $P(\text{future}, s)$ denotes the expected present value of premiums to be earned by the insurance or reinsurance undertaking in the segment s after the following 12 months for existing contracts;   |             |       |             |       |             |       |             |
| 78 | Income Protection  | 795   | 31          | (d) $P(\text{future}, s)$ denotes the expected present value of premiums to be earned by the insurance and reinsurance undertaking in the segment s for contracts where the initial recognition date falls in the following 12 months but excluding the premiums to be earned during the 12 months after the initial recognition date. |             |       |             |       |             |       |             |
| 79 | Workers' Comp  | 97    | 33          |  |             |       |             |       |             |       |             |
| 80 | Nonprop. Property R  | 812   | 5           |  |             |       |             |       |             |       |             |
| 81 | Nonprop. Casualty R  | 383   | 4           |  |             |       |             |       |             |       |             |
| 82 | Non-prop. MAT R  | 52    | 82          | 99   | 87          | 76    | 8           | 608   | 24          |       |             |
| 83 | Non-prop. Health R   | 911   | 97          |  |             |       |             |       |             |       |             |
| 84 | Motor Liability  | 135   | 98          |  |             |       |             |       |             |       |             |
| 85 | Other Motor  | 807   | 92          | 897  | 75          | 872   | 70          | 577   | 56          |       |             |
| 86 | MAT  | 607   | 57          |  |             |       |             |       |             |       |             |



## Part of the Igloo family

Igloo Standard Formula benefits from being part of a wider family of capital modelling products that fall under the Igloo umbrella and undergoes the same quality assurance process as all other Igloo products. Igloo can be used as the platform for a standalone internal model, a useful sense check for more sophisticated models or for a partial internal model.

Using a building block approach that leverages the other modules, Igloo Standard Formula users are given the flexibility to draw upon more sophisticated elements found within the wider family and realise the benefits of using a partial internal model within a Solvency II framework.

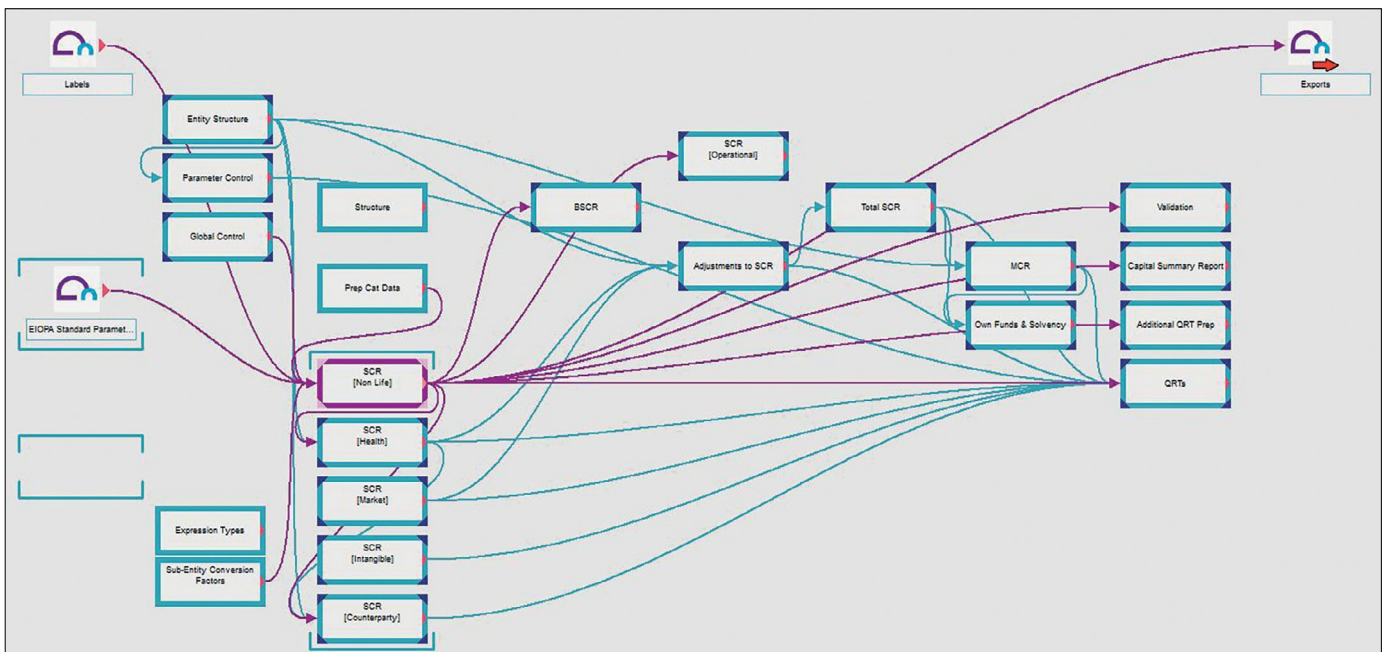
## Components of Igloo Standard Formula

**Igloo modelling platform:** Igloo Standard Formula is compatible with any Igloo edition from Express to Extreme.

**The Igloo Standard Formula library:** actual calculation kernel, including all reports and both solo and group models.

**Data control component:** optional additional governance feature to control model and data versioning, role based permissions, and more.

Figure 7. Modular structure assists development of partial internal models



## Why Willis Towers Watson?

Our unique combination of actuarial, consulting and software experience provides us with a holistic perspective on your modelling operations and IT infrastructure ensuring our offering is framed within wider organisational objectives.

This is what stands us apart from the competition:

### Continuous product innovation

We have been at the forefront of actuarial software longer than anybody else but we continue to innovate and push the boundaries for what our software products can accomplish. We are the world's largest provider of actuarial software with over 40 years' experience in developing market leading products. Our point solutions underlie everything we do and embody the expertise we possess as a leader in risk and financial management.

### Actuarial consulting insight

Our actuarial expertise sets us apart. We combine subject matter expertise with a rigorous development process. Our products are all developed in-house, from concept to creation with our actuarial consulting work informing their development. Our actuaries use our products in their work with insurance clients and the concepts for new software are derived from their need. Therefore, as soon as a particular market issue appears, we are likely to be already developing or improving a software product to solve your problem.

### Technical technology support

Not only do our technical experts have experience in implementing and administering Igloo Standard Formula but they also have intricate knowledge of the insurance software applications themselves. They fully understand your modelling needs and are well placed to make sense of the data and the results generated. Our experts provide ongoing support and offer a one-stop shop for any and every software-related question. Our unrivalled service includes 24x7 monitoring and support contact as well as built-in disaster recovery capabilities, bringing peace of mind for your critical business needs.

### Further information

To find out more about Igloo Standard Formula, please contact:

#### Colin McCarthy

Associate Director

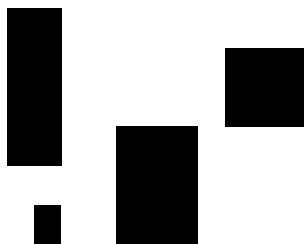
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WTW-HP-2021-0558

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