

# MARKET BULLETIN

REF: Y4128

<b>Title</b>	2009 ICA Minimum Standards and Guidance
<b>Purpose</b>	To update Agents on the 2009 ICA process and timetable and issue the revised 2009 ICA Minimum Standards and Guidance document.
<b>Type</b>	Scheduled
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<b>Date</b>	29 February 2008
<b>Deadline</b>	Provisional ICA submission: 11 July (non-aligned), 25 July – 11 Sept (aligned) Final ICA submission: 19 September (non-aligned), 17 October (aligned)
<b>Related links</b>	Attached documents: 2009 ICA Minimum Standards and Guidance, summary of changes from 2008 guidance

## Updated ICA Guidance

The enclosed "2009 ICA Minimum Standards and Guidance" document has been produced following Lloyd's review of the 2008 ICA submissions and feedback from agents on the 2008 process and instructions. The ICA basis, provision of pro-forma information and the minimum standards set out in the 2009 ICA Minimum Standards and Guidance must be adhered to by all agents. Managing agents should note that the 2009 Minimum Standards and Guidance document applies to both active and run-off syndicates.

As last year, all agents are required to complete a mapping to the minimum standards, cross referenced to their ICA submission and an analysis of change highlighting movements from the final agreed 2008 ICA.

Lloyd's has aimed to keep changes to the guidance document to a minimum. The changes relate mainly to issues where further clarification has been provided and a summary of key changes is attached to this bulletin.

## Basis for 2009 ICAs

There is no change to the required basis for the preparation of the ICA, which is set out in detail in the attached guidance. ICAs should continue to be prepared on a one year time horizon and both stochastic modelling and stress and scenario methods will continue to be acceptable.

## Economic Uplift

Lloyd's will continue to apply an uplift to syndicate ICAs for economic capital requirements at member level. For 2009 ICAs this uplift will remain at 35%.

## Focus for 2009 reviews

As discussed at the Market Briefing on 24 January, Lloyd's will look to focus on "key issues" for the 2009 process. The first of these is "embedding" of ICA models which Lloyd's will wish to review and understand in more detail. Any discussions and reviews around this are likely to be outside of the ICA timetable but will influence reliance on an agent's model number. This area is in line with the FSA's focus going forward and also in line with the principles of Solvency II.

In line with Lloyd's 3 year plan, the 2009 ICA reviews will also look to focus on cycle management. Lloyd's will expect the underwriting risk element within ICAs to increase as a proportion of premium as the cycle softens and any increases in exposure will be heavily challenged by Lloyd's. The 2009 ICA Guidance document also includes an additional minimum standard asking for a breakdown of premium movements showing clearly those that relate to changes in exposure as opposed to those which are due to rate changes.

## 2009 Process and Timetable

As advised to agents at the Market Briefing held on 24 January the 2008 timetable did cause some timing issues, both at the start of the process with holidays and at the end with a relatively short time to agree submissions. Lloyd's has therefore reviewed and amended the ICA timetable and the details are set out separately below for non-aligned and aligned syndicates.

It is intended that agents will only be required to submit one full ICA document to Lloyd's based on their initial SBF submission. This should comprise a full ICA document, completed ICA pro-forma summary and minimum standards mapping document. Syndicates will then only be required to submit a final ICA pro-forma summary and a 1-2 page reconciliation of the final number to their initial submission with the final SBF. However, agents should note that where there are significant feedback issues on the initial submission or major changes in the value being submitted, Lloyd's may require additional information to support the final ICA number submitted. The final ICA and submitted figure must be approved by the Board.

### Non aligned syndicates

Provisional SBF submission date	<b>20 June</b>
Initial ICA submission and pro-forma summary ( <i>must be full document</i> )	<b>11 July</b>
Final SBF and ICA pro-forma ( <i>accompanied by short reconciliation of change document to July ICA</i> )	<b>19 September</b>

### Aligned syndicates

Provisional SBF submission date	<b>25 July</b>
Initial ICA pro-forma summary ( <i>to be filed with SBF</i> )	<b>25 July</b>
Initial ICA submission ( <i>must be full document</i> )	<b>25 July - 11 Sep</b>
Final SBF and ICA pro-forma ( <i>accompanied by short reconciliation of change document to July ICA</i> )	<b>17 October</b>

Aligned syndicates will be able to submit their full ICA document either with the pro-forma on 25 July or at any time between this date and 11 September. ICA Team Leaders will contact agents to discuss proposed submission dates and all aligned syndicates will be required to agree a submission date within this range by the end of April. However, agents should be aware that where the pro-forma number submitted on 25 July raises concern or Lloyd's is aware significant changes to the ICA are likely, additional information may be requested from agents before the agreed submission date. Any new syndicates submitting an ICA for the first time will be required to submit as close to 25 July as possible to allow sufficient time for review.

### **Specialist RITC syndicates**

Agents managing specialist RITC syndicates should note that they are required to comply with the timetable given above. However, Lloyd's recognises that certain parts of the 2009 Minimum Standards and Guidance document will not apply to RITC syndicates and further clarification will be provided during March.

### **Run-off syndicates**

Agents should also note that submission of run-off ICAs will be required somewhat later than the timetable given above, as in previous years. The run-off timetable will be advised in a further Market Bulletin to be issued during March.

### **Reduced ICA submission requirements**

Some agents will not be required to submit a full ICA document and in these cases a summary of change document together with the ICA pro-forma will suffice. Lloyd's has devised a "risk based" scoring approach to determine the level of submission required for all agents. This process will be completed during March and ICA team leaders will advise each agent on the level of documentation required by the end of March.

### **Syndicate Business Forecasts**

Agents are reminded that whenever an amended SBF is required to be submitted, this must be accompanied by a revised ICA. This should comprise of an ICA pro-forma summary and brief explanation of change to the ICA number. Any amended ICA is subject to the same Board approvals as the original submission.

### **Franchise Standards**

The Lloyd's Performance Framework comprises a set of standards that make clear Lloyd's requirements of each managing agent and enable Lloyd's to maintain and enhance the Lloyd's platform. The first 3 sections of the performance framework (Underwriting Management, Claims Management and Risk Management) came into operation on 1 January 2007. The remaining three sections (Effective Operational Processes, Governance and Protecting Lloyd's Reputation and Brand) came into effect on 1 January 2008.

Agents should ensure that where they do not fully meet these standards, this is reflected in the risk register and the associated risk is captured in the ICA to ensure that adequate capital is in place. Agents should consider gaps in performance identified by any Lloyd's reviews, as well as those highlighted by self assessment exercises. The ICA submission should identify clearly where capital has been allocated as a result of any areas where the agent does not yet meet the minimum standards. Where agents consider that they fully meet the standards, their submission should confirm this.

### **Benchmark**

As advised to agents, Lloyd's is currently developing a new capital benchmark system. Whilst this model is being developed and finalised, Lloyd's will continue to use the existing RBC model as a benchmark for the 2009 ICA review process.

### **Exchange rates**

The Lloyd's benchmark will initially use the PIM exchange rate as issued in April but this will be updated to use the FAL rate as at 30 June 2008 (as determined for CIL) when available. Whilst agents will be required to use the PIM rate for SBF purposes, Lloyd's will accept an ICA using either the PIM rate or FAL rate. Where the ICA uses a different rate to the SBF, agents should explain this and provide a reconciliation to the SBF numbers.

### **Next steps**

Hard copies of the 2009 ICA Minimum Standards and Guidance document are being printed and will be issued to agents as soon as possible. ICA team leaders will contact all agents by the end of March to discuss feedback on the 2008 process, submission requirements and the 2009 timetable. In the meantime, agents should contact their ICA team leader if they are unclear on any aspect of this bulletin or the attached documents.

This bulletin is being sent to all managing agents, members' agents and recognised accountants and will be made available to other professional advisers.

John Parry  
Chairman, ICA Steering Group

## ICA - 2009 MINIMUM STANDARDS AND GUIDANCE - SUMMARY OF KEY CHANGES

Section	Page	Subject	Comments
<b>Basis for ICA</b>	10	Run off syndicates	Guidance document now applies to both active and run-off syndicates
	11	Consistency with SBF	Confirms that Lloyd's will not accept an ICA that is not prepared on a basis consistent with the SBF. Explains basis for pro-forma ULRs and why these may differ from the SBF. ICA submissions should now include a reconciliation between the pro-forma and the SBF.
<b>Minimum standards</b>	18	Reserving Risk - reserving assumptions	Expanded section to clarify existing guidance on forecast technical provisions as at 31.12.2008. Assumptions made on the run-off of business between the latest set of reserves and the valuation date should be clearly explained and justified.
	23	Group risk – capital allocation	Confirms that Lloyd's expects some allocation of capital for group risk where an agent is part of a wider group or manages multiple syndicates.
<b>Approach and methodology -</b>	29	Modelled approach	More commentary on parameterising models and the need to consider the assumptions made in the ICA in the aggregate as well as at a more detailed level
	30-31	Loss modelling and parameter setting	Update on cat model settings and need for consistency between approaches used for underwriting/pricing and capital setting
<b>Detailed Guidance on insurance risk and operational risk</b>	40,48 & 64	New syndicates	Revised minimum standard on new syndicates and/or new classes of business – detailed guidance added on areas that agents should consider in relation to underwriting and reserving risk for new syndicates. Operational risk section also includes further comment on new syndicates.
<b>Detailed Guidance on underwriting risk</b>	37	Premium movements	New minimum standard – requirement to provide breakdown of premium movements from agreed 2008 ICA position
	38	Catastrophe losses	Minimum standard on catastrophe losses – agents asked to state how climate change considered and any resulting change in parameter setting
<b>Detailed Guidance on reserving risk</b>	43	Reserve margins	Further explanation of rationale for allowing only up to 50% credit for reserve margins.
	45	Investment income/ Discounting of reserves	Expanded section to clarify existing guidance on discounting/investment income and on treatment of investment income on FAL. New guidance on allowable rate of return – agents no longer required to use the risk free rate, but must ensure that their approach for evaluating market risk is consistent with whatever rate used.
<b>Appendix 3</b>		Pro-forma guidance notes	Expanded guidance to clarify the data requirements of the pro-forma

# ICA

## **2009 MINIMUM STANDARDS AND GUIDANCE**



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# INTRODUCTION

## Background

The FSA's requirements for Individual Capital Adequacy Standards (ICAS) for insurers are set out in the General Prudential Sourcebook (GENPRU) and the Prudential Sourcebook for Insurers (INSPRU). GENPRU sets out the FSA's prudential requirements applying generally to banking, investment and insurance firms whilst INSPRU sets out specific prudential requirements for insurers and Lloyd's. These requirements apply directly to managing agents in relation to the syndicates they manage and should be referred to by agents in addition to this guidance document.

GENPRU and INSPRU focus on the FSA's three sub-principles of ICAS which are:

- there must be a coherent and complete assessment of the risks faced by the business
- there should be a clear common definition of survival, ensuring that there is a 99.5% confidence level over a one year timeframe that the value of assets exceeds the value of liabilities
- the assessment must be sensible and document the underlying reasoning and judgements

The FSA has placed clear responsibilities upon Lloyd's within the ICAS regime. Lloyd's must be able to justify the reliance which it places on a syndicate ICA by being able to demonstrate that it has carried out appropriate checks.

Lloyd's continues to work closely with the FSA in order to ensure that the FSA can build on Lloyd's work and thus avoid duplication of effort wherever possible. Whilst syndicate ICAs may meet the FSA's requirements, as a mutual society, Lloyd's has an obligation to rigorously review syndicate ICAs to ensure that no syndicate poses an undue risk to the central fund. Lloyd's review will therefore seek to focus on risk mitigation in addition to capital. As member level capital setting is dependent on the syndicate ICAs, Lloyd's must ensure that they are all consistent for this purpose. Finally, the overall security of Lloyd's rests on the level of central assets and in determining these, Lloyd's depends on syndicate ICAs as a key source of information.

The best mitigant for this risk is for both Lloyd's and the FSA to be confident that syndicate ICAs are set at the right level. Given the subjectivity of the review process however, Lloyd's cannot exclude the possibility that the FSA may apply individual capital guidance (ICG) assessments to syndicates' ICAs in line with its own risk-based approach.

### Lloyd's Review

Our aim is to be proportionate in our review which will take into account the structure and business profile of the individual syndicate. To this extent, Lloyd's requires that agents highlight and rank their most significant risks and explain how these have been addressed within the ICA.

Lloyd's general approach to reviewing ICAs is to consider the reasonableness of the calculation methodologies and assumptions used

**THE FSA'S REQUIREMENTS FOR ICAS ARE SET OUT IN GENPRU AND INSPRU**

**THE FSA HAS PLACED CLEAR RESPONSIBILITIES UPON LLOYD'S WITHIN THE ICAS REGIME**

**LLOYD'S REVIEW WILL SEEK TO FOCUS ON RISK MITIGATION IN ADDITION TO CAPITAL**

**LLOYD'S REVIEW WILL  
CONSIDER BOTH  
QUANTITATIVE AND  
QUALITATIVE ISSUES**

as well as the results derived by application of those methodologies and assumptions. Lloyd's keeps an open mind on the majority of calculation approaches used by agents, placing the onus on them to satisfy us that their particular approach is appropriate to their individual circumstances. Lloyd's recognises that not all syndicate ICAs will need to be prepared with the same degree of modelling complexity and the level of sophistication of the calculations should be commensurate with the materiality and nature of the underlying risks.

Our assessment is essentially high level and does not constitute a line by line audit of the calculations. This underscores the importance Lloyd's places on an agent's senior management taking responsibility for their syndicate ICAs.

**LLOYD'S REVIEW OF ICAs  
IS NOT A LINE BY LINE  
AUDIT AND NEW ISSUES  
MAY ARISE EACH YEAR**

Lloyd's review of syndicate ICAs will consider both quantitative and qualitative issues. Agents should be aware that the Lloyd's review each year is not a full audit and therefore issues may arise which have not been queried in previous years. Where Lloyd's considers the level of capital to be less than adequate it has a responsibility to increase the ICA to a level which is adequate.

Lloyd's will apply a loading to specific risks within the ICA where it is considered that they have not been addressed sufficiently. There are many instances where an agent selects from a range of reasonable assumptions. Where Lloyd's considers that the ICA is based consistently on selection from the optimistic end of each range, this could lead to a concern at the aggregate level.

If Lloyd's considers that an ICA does not adequately address the minimum standards as set out in this document, Lloyd's may be unable to rely on the ICA to set capital levels. In such instances Lloyd's will use the RBC model benchmark number plus a 20% loading to set syndicate capital requirements.

**LLOYD'S WILL BE UNABLE TO  
RELY ON AN ICA WHICH DOES  
NOT ADEQUATELY ADDRESS  
THE MINIMUM STANDARDS**

Lloyd's intends to adopt a "risk based" approach to the 2009 ICA review process which will result in a more tailored approach to the review of ICAs. This will allow Lloyd's resources to be targeted accordingly and in proportion to the perceived risk posed by each agent.

## Scope of Guidance

This guidance relates solely to the preparation of the ICA being the minimum regulatory capital required and does not cover additional requirements for the Economic Capital Assessment (ECA). Syndicates should also refer to GENPRU, INSPRU and the FSA's Insurance Sector Briefing: ICAS Lessons learned and looking ahead to Solvency II, issued in October 2007, as additional sources of information.

This guidance document is split into four main sections as follows:

- this introduction which sets out the required basis and scope for 2009 syndicate ICAs and Lloyd's overall approach to its review work
- a minimum standards section which sets out in brief the main issues and minimum standards required. This should be read by all involved in the ICA process, including the Board members and senior management who are responsible for signing off the ICA
- a detailed technical section split by risk group containing guidance for those responsible for preparing the ICA

## **ALL AGENTS MUST COMPLETE FULL PRO-FORMA AND MINIMUM STANDARDS MAPPING**

- appendices containing formats for the ICA document, minimum standards mapping and the additional pro-forma information required. Although the suggested ICA structure is not mandatory, a submission in this layout will facilitate our internal ICA review and comparison across ICAs. Any agent seeking reduced submission requirements going forward should set out their 2009 ICA in this format. Completion of both the full pro-forma and minimum standards mapping document is a requirement for all syndicates (details are in Appendices 1, 2 and 3)

## **Solvency II**

Whilst there has been significant progress over the last year on Solvency II, the full implications for capital setting are not yet known. Although there will be a strong linkage with the current ICAS framework, agents should be aware that there is likely to be some capital impact and this should become clearer over the next 12 months.

Consultation within the EU on the Solvency II Framework Directive is currently ongoing and Lloyd's will keep agents informed of progress as details become available.

## **Basis for ICA**

The required basis for the preparation of the 2009 ICA is as follows:

- the ICA must provide for all losses, modelled to ultimate, arising after 1 January 2009 on the syndicate's 2009 and prior years of account at a 99.5% confidence level - this includes all losses arising on business earned from 1 January 2009 and the risk that claims reserves as at 31 December 2008 for business earned up to that date prove to be inadequate. This "one year model" only excludes risks attaching to 2010 and future underwriting years of account compared to a multi year model. A one year basis is not restricted to examining losses materialising only in the twelve months to December 2009. If an agent intends to use a multi year model, they should contact their ICA review team leader as soon as possible
- this basis represents the equivalent of minimum regulatory capital and does not represent the economic capital which is the level of capital required to support and maintain Lloyd's ratings
- agents must prepare a separate ICA for each syndicate covering all years of account of the syndicate combined
- the assumptions used in the ICA must be consistent with those used in the Syndicate Business Forecast (SBF)
- the ICA must be based on planned income
- the ICA must be prepared on the assumption that all profits have been distributed and all losses collected or fully receivable

Lloyd's central assets and risks (eg New Central Fund and subordinated debt) and any Funds at Lloyd's (FAL) are outside the scope of a syndicate's ICA and must not be included.

The ICA must be prepared on an ultimate basis and may make appropriate allowance for future investment income. It does not need to recognise reserving strains that would arise in the future under annual accounting.

## **THE ICA MUST PROVIDE FOR ALL LOSSES TO ULTIMATE AT A 99.5% CONFIDENCE LEVEL**

## **ESSENTIAL THAT ASSUMPTIONS USED IN THE ICA ARE CONSISTENT WITH THOSE IN THE SBF**

## **AGENTS MUST EXPLAIN THE KEY PRINCIPLES UPON WHICH THE ICA IS BASED**

Agents must consider all the FSA risk groups in accordance with the minimum standards set out in this document. All minimum standards must be addressed within the ICA and where an agent considers they do not apply or do not necessitate any capital allocation, this must be clearly stated and explained.

In their ICA submission, agents must also explain the following:

- the approach to deriving the ICA and how it links together the business plan, key risks inherent in the business, related risk management processes and practices and the capital required by the risks
- why the methodology chosen is appropriate to the syndicate's business, taking account of its risk profile, risk appetite, track record with respect to risk experience and exposure and the key principles upon which the ICA is based
- the approach adopted towards the quantification of risk and the rationale for this approach
- the stress and scenario tests used and why they are appropriate for the business
- the sensitivity of key assumptions
- the overall ICA figure split by major risk category, before and after diversification

The ICA must set out clearly the allocation of capital across risk groups and the rationale and method used to derive the figures for each. All components, including non insurance risks, must be calculated and the allocation clearly explained. Agents requiring guidance on capital allocation should contact their ICA team leader for sources of information regarding this area.

## **AGENTS MUST PROVIDE AN ANALYSIS OF CHANGE AS PART OF THE 2009 ICA SUBMISSION**

Where an ICA was produced for 2008, agents must provide an analysis of change as part of the 2009 submission. This should be based on the final agreed 2008 ICA number and provide a commentary per risk group explaining any changes in methodology or number and should include any significant changes in the allocation between risk groups.

Agents should also explain movements between the 2008 assumed premium as per the latest 2008 ICA submitted to Lloyd's and the planned 2009 premium used in the 2009 ICA and SBF. The analysis should show separately the change in exposure and the change in rates.

### **Run off syndicates**

ICAs for specialist RITC and run-off syndicates must be prepared on the same basis as those for active syndicates, at a 99.5% confidence level with all losses to ultimate and the assumptions must be consistent with those in their business plan as approved by Lloyd's. Where the business plan uses materially changed assumptions, agents should discuss this with their ICA team leader.

## **RUN-OFF ICAS SHOULD NOT TAKE ACCOUNT OF PLANNED CLOSURE AND SHOULD ASSUME RUN OFF TO NATURAL EXPIRY**

For all run off syndicates the ICA must be calculated on the assumption that the run-off will continue to natural expiry and no account should be taken of planned closure. Specialist RITC syndicates should also assume run-off to natural expiry unless they consider this inappropriate in which case they should contact their ICA team leader at an early stage to discuss an alternative approach.

**AGENTS SHOULD PROVIDE A RECONCILIATION BETWEEN THE MEAN ULR IN THE ICA PRO-FORMA AND THE SBF**

**COMPARISON OF ECR AND ICA IS A KEY FOCUS FOR THE FSA AND AGENTS MUST EXPLAIN MATERIAL DIFFERENCES**

**AGENTS MUST EXPLAIN THE BASIC ASSUMPTIONS AND KEY DRIVERS OF THE ICA**

### Lloyd's charges

When considering Lloyd's central charges in calculating future expenses, agents should plan that members' subscriptions and central fund contributions will each be 0.5% of gross written premium (net of acquisition costs) for 2009.

### Consistency with SBF

It is a requirement that the assumptions used in the ICA are consistent with those used in the SBF and Lloyd's will not accept an ICA which is not prepared on this basis. The pro-forma requires agents to state the SBF submission on which the ICA is based.

It should be noted however that for the purposes of the 2009 ICA submission pro-forma summary (Appendix 3), both the mean and the 1:200 ULRs are requested on the basis that they should include business written in 2009 as well as business written in prior years of account but unearned as at 31 December 2008. For this reason, the mean ULR shown on the pro-forma may differ from that shown in the SBF and agents are therefore requested to provide a reconciliation of the mean ULR between that in the pro-forma and that in the SBF in order to confirm that they have been prepared on a consistent basis.

The gross premium assumptions and planned reinsurance arrangements must be the same within the SBF and the ICA.

### Enhanced Capital Requirement (ECR)

It is an FSA requirement under GENPRU and the ICAS regime for all insurers to calculate an ECR as part of the ICA process. This applies equally to Lloyd's syndicates and agents are required to calculate an ECR as at 31 December 2008. Whilst the ECR is a factor based calculation and therefore not necessarily directly comparable with the ICA, the FSA does use the ECR as a benchmark when assessing the level of a firm's ICA and ICG is set as a percentage of ECR.

Comparison of ECR and ICA is a key focus for the FSA and agents must include a comparison of the two within their submission and provide an explanation in support of any material differences, particularly where the ICA is lower than ECR.

Agents are also required to include details of the ECR requirement as at 31 December 2007 based on final year end data as part of the pro-forma information.

### Approach and Methodology

Agents must ensure that there is a clear audit trail from the impact of any financial calculations to the relevant risk capital allocation in the ICA, whatever modelling approach is adopted. Agents must also include an explanation of the basic assumptions and key drivers of the ICA in their submission.

Where considerations of particular risk issues have been made, an agent must state specifically the issues considered, how it considered them and the reasons behind the conclusions and findings.



**AGENTS SHOULD CLEARLY DEMONSTRATE THE LINK BETWEEN THEIR RISK FRAMEWORK AND THE ICA**

**Link to risk framework**

Three key objectives of the ICAS regime are; to ensure that senior management focus on risk management; that there is a link between risk and capital-setting; and that this is demonstrated through clear documentation of all prudential risks, processes and controls.

In making an assessment of capital adequacy, agents should first identify the significant risks facing their business and subsequently quantify how much capital is required. Central to this process should be the agent's risk management framework. In calculating a syndicate's ICA, agents must clearly demonstrate the link between their risk framework and the ICA calculation.

**DEMONSTRATE THAT THE IMPACT ON THE ICA IS ASSESSED WHEN MAKING STRATEGIC DECISIONS**

**Embedding and the 'use test'**

There is increasing focus on how agents are embedding the ICA. The FSA has commented that significant work is still required to embed ICAs into firms' risk management frameworks, particularly if they are to meet the expected Solvency II requirements for internal model approval. Firms that appear to have embedded the ICA most effectively can demonstrate that the impact on the ICA is assessed when making strategic decisions. The extent to which the ICA is embedded in the business will also be a focus of Lloyd's reviews.

**UNDERWRITING RISK ELEMENT WITHIN ICAS WILL INCREASE AS A PROPORTION OF PREMIUM**

**Market conditions**

Lloyd's three-year plan 2008-2010 document was published in December 2007 and highlights managing the cycle as a key priority during a period of softening market conditions.

Lloyd's anticipates that the underwriting risk element within ICAs will increase as a proportion of premium during the plan period if managing agents properly take into account the prevailing market conditions in their capital assessments.

**GAPS IN PERFORMANCE AGAINST FRANCHISE STANDARDS MUST BE ADDRESSED IN ICA**

**Lloyd's Performance Framework – Franchise standards**

The Lloyd's Performance Framework comprises a set of standards that make clear Lloyd's requirements of each managing agent and enable Lloyd's to maintain and enhance the Lloyd's platform. The first three sections of the performance framework (Underwriting Management, Claims Management and Risk Management) came into operation on 1 January 2007. The remaining three sections (Effective Operational Processes, Governance and Protecting Lloyd's Reputation and Brand) came into effect on 1 January 2008.

Agents should ensure that where they do not fully meet these standards this is reflected in the risk register and the associated risk is captured in the ICA to ensure that adequate capital is in place. Agents should consider gaps in performance identified by any Lloyd's reviews, as well as those highlighted by self assessment exercises.

The ICA submission should identify clearly where capital has been allocated as a result of any areas where the agent does not yet meet the minimum standards. Where agents consider that they fully meet the standards, their submission should confirm this.

## Stress and scenario vs modelled ICAs

There are two broad approaches available to agents when calculating a syndicate ICA, namely:

- stress and scenario tests
- economic capital models (also known as stochastic models or Dynamic Financial Analysis (DFA))

Although these are significantly different in application, they are not in principle different as a stochastic model is based on stress and scenarios weighted by probabilities. In a DFA model, stress tests are generated automatically and often cannot be “seen”. Both methods are acceptable for the 2009 ICAs.

It takes time to develop a stochastic model that is sufficiently robust. It is also important that management understands and “buys in” to the model. Even where a stochastic model has been used, stress tests are needed to validate the model output for reasonableness and to help with calibrating assumptions. Lloyd’s expects agents to demonstrate within the ICA that checks or reasonableness tests have been performed on the outputs in addition to the detailed review of the model inputs. Agents must ensure that the stress and scenario tests which they undertake are relevant to their business and sufficiently extreme to represent the 1:200 level.

Example stress tests for “reasonableness checks” are set out in the detailed sections on each risk group where applicable. This list is not exhaustive and is not a substitute for stress tests relevant to each individual business. The schedule is not prescriptive, however, where Lloyd’s is unable to get comfortable with the stress tests used by an agent, these are example stress tests that Lloyd’s may require the agent to perform to support the conclusions in the ICA.

## Parameter uncertainty

Uncertainty in the parameters used to assess the capital required has many potential sources, but the most common is lack of credible relevant data on which to base the main assumptions.

Agents should ensure that sufficient data over and above a syndicate’s own data is considered where appropriate. Additional stress tests should also be performed on uncertain assumptions.

Agents should highlight within their submission any assumptions or areas of modelling which are deemed to be prudent. The adoption of prudent assumptions in the ICA will be taken into account in Lloyd’s review and will increase the credibility of the assessment.

Where agents are aware of areas of weakness or optimism in the submission, these should be explicitly addressed. Agents should not make a general statement that these are offset by prudence elsewhere.

## Sensitivity analysis

As a minimum standard and part of the validation and sign off process, all ICAs must be subject to sensitivity analysis.

Given the uncertainty surrounding parameters, agents should not view the final set of assumptions as somehow ‘correct’. Management should understand the uncertainty in setting parameters and agents will be expected to have undertaken sensitivity testing and for sensitivity analyses to have been communicated to the Board and senior

**STRESS TESTS ARE  
NEEDED EVEN WHERE A  
MODEL HAS BEEN USED**

**ALL ICAs SHOULD BE  
SUBJECT TO SENSITIVITY  
ANALYSIS**

management. Sensitivity testing can also help the Board to collectively agree the ICA by highlighting the key assumptions in the model, quantifying the sensitivity of the result to these assumptions and assessing the relative importance of any difference of opinion.

The ICA submission should identify which of the parameters are the most critical to the ICA value, and give indicative movements in the ICA value for the most sensitive parameters.

### **Board understanding and challenge**

A significant issue for both Lloyd's and the FSA in reviewing ICAs is the integration of capital and risk management, particularly the level of involvement of senior management and the Board in deriving and challenging the capital assessment.

Consequently, Lloyd's requires agents to describe how they have engaged their senior management and the Board in the process, and in particular, the steps they have taken to educate the Board so that they are able to provide informed challenge as part of the sign-off process. This is particularly key where an external model has been used or part of the ICA has been outsourced to external consultants.

Senior management and the Board should in particular:

- consider the evidence and rationale behind subjective elements of assumptions
- focus on the most material elements and use sensitivity testing to understand these
- ask for reasonableness checks to confirm the extent to which the ICA results match other information about the firm
- get an illustration of the loss scenarios relevant to the firm and
- test the robustness of operational risk assessments.

For the 2009 year of account, agents will be required to submit a full ICA document based on the provisional SBF submitted to Lloyd's in June or July. Board members should ensure they are aware of all issues raised during the review process and recognise that following Lloyd's review of the ICA, revision may be required to the initial submission. The final ICA and submitted figure must be approved by the Board.

Formal Steering Group feedback will be provided to agents based on the final ICA number. Agents will recognise the limited time available to agree capital for 2009. Consequently, the initial ICA submitted should be a full document so that any key issues can be addressed prior to the final submission.

### **Reporting Requirements**

The following documents will be required for each ICA submission:

- ICA document with full mapping and audit trail (see Appendix 1)
- minimum standards mapping document (see Appendix 2)
- pro-forma information summary (see Appendix 3)

A syndicate ICA is required for all syndicates. Where the last open year of a syndicate is expected to close into another as at 31 December 2008 (the 'as at' date of the ICA calculation) then agents may choose not to produce an ICA for the closing syndicate year provided that:

**SENIOR MANAGEMENT AND BOARD MUST BE INVOLVED IN DERIVING AND CHALLENGING ICA**

**THE INITIAL ICA SUBMITTED TO LLOYD'S SHOULD BE A FULL DOCUMENT**

**THE FINAL ICA AND SUBMITTED FIGURE MUST BE APPROVED BY THE BOARD**

- the ICA of the receiving syndicate includes the risk exposure of the closing syndicate
- the agent intends that the closure/merger will take effect by the year-end. If there is material doubt as to the closure taking effect then the agent should produce a separate ICA

Separate ICAs are not required for quota share syndicates or parallel syndicates but agents must include any exposure within the main syndicate ICA. This is subject to the “host” syndicate providing an ICA that includes sufficient information to cover both the “host” and quota share syndicate.

Where the business underwritten by a special purpose syndicate differs significantly from the “host” syndicate, a separate ICA may be required and agents should contact their ICA review team leader in the first instance to determine requirements.

Agents should seek clarification from their ICA review team leader if they are unsure as to whether a syndicate counts as a quota share or parallel syndicate for ICA purposes.

### **New syndicates**

Lloyd’s recognises that new syndicates are unlikely to be able to produce a full ICA document prior to commencing underwriting. Initial capital requirements will therefore be set using the RBC model benchmark number which will include a 20% new syndicate loading. Agents will then be asked to submit a full ICA document to Lloyd’s at the next formal submission date although Lloyd’s may request a provisional submission prior to this to permit feedback to agents ahead of the full submission.

In addition to areas covered in the guidance for new classes of business, we would expect the ICA for a new syndicate to include some allowance for reserving risk going forward - this is in line with the benchmark which adds some back year data to produce a reserving risk number and prevent sharp increases in capital over the first 2-3 years. The ICA should also consider additional operational risks for a new business, including any potential management stretch which may arise and consider the risk of early cessation of the syndicate if business does not go to plan.

### **Ongoing reporting requirements**

In line with the principles of the FSA’s ICAS regime, Lloyd’s considers it an agent’s responsibility to keep all key risks and drivers under regular review and assess their impact on the syndicate’s capital requirement. Where the risk profile of the syndicate has changed materially or a new SBF is submitted during the year, the agent must provide an amended ICA to Lloyd’s. Minimum filing requirements for re-submissions are as follows:

- revised SBF
- ICA pro-forma summary information
- ICA summary of change document

The summary document must provide details of the change(s) impacting capital needs and set out clearly an analysis of change from the previous ICA. Any amended ICA is subject to the same Board approvals as the original submission.

## **AGENTS SHOULD CONTACT THEIR ICA TEAM LEADER TO DETERMINE REQUIREMENTS FOR SPECIAL PURPOSE SYNDICATES**

## **A NEW SYNDICATE ICA SHOULD CONSIDER ADDITIONAL OPERATIONAL RISKS**

## **AGENTS MUST KEEP ALL KEY ICA RISKS AND DRIVERS UNDER REGULAR REVIEW**

## Remaining adequately capitalised

The free funds available to a member to meet its capital requirements may fall below the required level for two reasons:

- increases to syndicate ICAs following a material change to the risk profile of the business
- the erosion of funds due to losses

Board and senior management should ensure that this is kept under continuous review and that the syndicate remains adequately capitalised.

In either case, the timetable for recapitalisation and the intervention by Lloyd's will depend on the extent of the shortfall. All members are subject to bi-annual Coming into Line (CIL) in June and November, where members are required to hold free funds at their economic capital level. Lloyd's has powers to require members to meet their ECA at all times, but will normally permit recapitalisation in accordance with this bi-annual timetable, provided that members' free funds remain above their ICA.

Where a member's funds fall below their ICA level, Lloyd's would expect members to inject additional capital outside of the normal CIL timetable. Where there is material exposure to the central fund and policyholder security, underwriting restrictions or other measures may be imposed to mitigate the risks until capital is lodged at Lloyd's.

In accordance with the continuous solvency regime, where a member's free funds fall below the level of regulatory solvency (underwriting losses plus required minimum margin), the existing powers to immediately suspend underwriting or any other measures deemed appropriate by Lloyd's may be used.

**THE BOARD SHOULD  
ENSURE THAT THE  
SYNDICATE REMAINS  
ADEQUATELY CAPITALISED**

## MINIMUM STANDARDS

### AGENTS ARE REQUIRED TO CONSIDER AND ADDRESS ALL MINIMUM STANDARDS

This section of the guidance gives an overview by risk group and advises agents of the minimum required standards to be considered when calculating the capital requirements for each risk group. Agents must consider and address each of these and further explanations as applicable are contained in the detailed sections of the guidance for each risk group. Where an agent considers that any of these areas are not applicable to their business, the justification for this must be clearly set out within the ICA.

Some risk groups will, by default, cross over with and pick up risks from other groups, eg credit risk and insurance risk, operational risk and insurance risk. Agents should provide details and cross reference these where applicable.

### Insurance Risk

#### Definition

Insurance risk is defined as the risk of loss arising from the inherent uncertainties about the occurrence, amount and timing of insurance liabilities and premiums.

#### Scope

Insurance risk includes the risk of loss arising from prospective underwriting and the development of prior years. It should also cover the risk associated with potential for increased operating expenses. Whilst there are numerous dependencies between these risks and other risk groups, such as credit risk and operational risk, the assessment of insurance risk can be considered under the headings of underwriting, reserving and reinsurance.

These three components are mutually dependent, and this must be recognised. Agents should also recognise the link between operational risk and insurance risk and this is explained in more detail within the operational risk section.

The assessment of reinsurance as part of insurance risk should relate to mismatch, dispute, exhaustion etc and not the associated credit risk which should be identified separately as part of the assessment of credit risk within the ICA.

#### Minimum Required Standards

The following minimum standards apply equally to underwriting and reserving risk and have therefore been grouped together within this overview section under insurance risk. Agents should address these when assessing both underwriting and reserving risk and the detailed section of this document provides further guidance on each of these under separate headings as appropriate. Minimum standards specific only to either underwriting risk or reserving risk are shown separately under the relevant headings in this section:

- unexpired risks on 2008 and prior years of account (YOA) and 2009 YOA risk
- catastrophe losses
- large individual risk losses

### UNDERWRITING RISK, RESERVING RISK AND REINSURANCE RISK ARE MUTUALLY DEPENDENT

**UNDERWRITING RISK  
RELATES TO LOSSES  
ARISING ON BUSINESS  
EARNED FROM 1.1.09**

- attritional loss experience
- new syndicates and/or new classes of business
- application of reinsurance programme
- operating expenses
- use of syndicate data and benchmarking
- allowance for trends such as inflation
- dependence between underwriting years
- operational risks associated with insurance risk

### Underwriting

Within insurance risk, underwriting risk relates to losses arising from business earned from 1 January 2009 for all 2009 and prior years of account business. The risk of loss is to ultimate.

This definition will assist Lloyd's in its benchmarking and review work to provide a consistent allocation by syndicates between "underwriting risk" and "reserving risk".

### Minimum Required Standards

When assessing underwriting risk, agents must consider and address, as a minimum, each of the areas listed below in addition to those under insurance risk above:

- underwriting cycle
- unearned profits
- reasonableness checks on extremity of gross and net ULRs at 1:200 confidence level
- breakdown of gross and net ULRs between catastrophe, large and attritional losses
- breakdown of premium movements
- growth through additional exposure

### Reserving

Reserving risk is the risk that claims reserves set as at 31 December 2008 for business earned up to that date prove to be inadequate. The ICA must consider the ultimate position.

The forecast claims technical provisions as at 31 December 2008 should be based on the latest set of reserves on which an actuarial opinion has been obtained. Assumptions made for the run-off of the business over the period between the latest set of reserves and the valuation date (including assumptions regarding business expected to be earned by the valuation date as well as that already earned) should be stated clearly and justified. Agents should also ensure that they incorporate the latest claim information available to the syndicate prior to submission. For example, if future claims during 2008 are expected to be incurred in line with SBF assumptions, these assumptions should be stated and shown to be still valid against latest claim information. If large losses have occurred in the year agents should address these specifically.

Reserving risk includes reserving inadequacy and over-reserving if it causes a loss. Any requirement under GAAP to hold technical provisions

**ASSUMPTIONS MADE FOR  
THE RUN-OFF OF THE  
BUSINESS SHOULD BE  
CLEARLY JUSTIFIED**

**RESERVING RISK RELATES TO  
THE ADEQUACY OF CLAIMS  
RESERVES FOR BUSINESS  
EARNED AS AT 31.12.08**

which exceed the best estimate of ultimate provisions may be ignored. As the ICA models all risks to ultimate, the GAAP reserving basis only affects intermediate assessments, not the final position.

### Minimum Required Standards

When assessing reserving risk, agents must consider and address, as a minimum, each of the areas listed below in addition to those under insurance risk above:

- modelling (eg bootstrapping)
- reserve margins
- investment income/discounting of reserves
- latent claims
- regulatory changes

### Reinsurance

Agents must consider the risks associated with the use of, and potential reliance on, reinsurance linked with underwriting and reserving risk within insurance risk. This must cover the areas set out below but should not include the risk of reinsurer failure which falls into credit risk.

### Minimum Required Standards

Agents must consider and address, as a minimum, each of the areas listed below:

- non matching reinsurance
- exhaustion
- post loss impact on cost and availability
- concentration of reinsurers
- dispute
- structured and/or multi year reinsurance policies
- Industry Loss Warranties (ILW)/Original Loss Warranties (OLW) basis risk

### Credit Risk

#### Definition

Credit risk refers to the risk of loss if another party fails to perform its obligations or fails to perform them in a timely fashion. For syndicates, key counterparties include reinsurers, brokers, insureds, reinsureds, coverholders and investment counterparties.

#### Scope

Any financial transaction with a counterparty may expose a syndicate to credit risk. Agents should take into consideration all potential areas of credit risk, in particular reinsurers, brokers and coverholders. When considering reinsurance credit risk, agents should not include exhaustion and dispute; these should fall into insurance risk. Agents should however consider the dependency between dispute risk and credit risk.

When assessing the appropriate level of capital for credit risk, agents should exclude credit risk in respect of central assets, including Additional

**REINSURER FAILURE  
SHOULD BE INCLUDED IN  
CREDIT RISK**

**REINSURANCE EXHAUSTION  
AND DISPUTE RISK SHOULD  
BE INCLUDED IN INSURANCE  
RISK**



Securities Ltd, Joint Asset Trust Fund and other regulatory deposits as these are covered in the overall Lloyd's ICA.

### Reinsurance Credit Risk

Reinsurance credit risk is usually the largest component of credit risk and deals with the potential bad debt on reinsurance assets. Lloyd's would ask that best efforts are made to split out reinsurance credit risk from insurance risk as this will assist Lloyd's benchmarking process. Lloyd's recognises however that this is difficult to do in some models. Where this is the case and agents are unable to split it out, Lloyd's may request as a sensitivity test for this, agents to calculate the insurance risk assuming no credit risk compared to the actual assumptions and justify the difference.

Reinsurance credit risk within the ICA relates only to potential bad debts beyond those already provided for in the accounts at 31 December 2008. Reinsurance credit risk must be modelled to ultimate.

### Minimum Required Standards

Agents must consider and address, as a minimum, each of the areas listed below:

- gross and net losses
- link increased probability of reinsurance failure to extreme losses
- concentration risk
- reinsurance failure rates should allow for the risk of downgrade
- duration of recoveries
- treatment of reinsurance placed with other Lloyd's syndicates
- treatment of any intra group reinsurance

### Other Credit Risk

Agents are reminded that FAL is outside the scope of ICAs and does not need to be addressed in assessing credit risk.

### Minimum Required Standards

Agents must consider and address, as a minimum, each of the areas listed below:

- brokers
- coverholders
- third party claims administrators
- banks and investment counterparties

## Operational Risk

### Definition

Operational risk refers to the risk of loss resulting from inadequate or failed internal processes, people and systems, or from external events.

### Scope

The following two approaches are considered appropriate by Lloyd's when looking at operational risk:

**REINSURANCE CREDIT RISK MUST BE MODELLED TO ULTIMATE**

**FUNDS AT LLOYD'S ARE OUTSIDE THE SCOPE OF ICAs**

**THE ICA SHOULD INCLUDE ALL RISKS OF OPERATIONAL FAILURE**

- operational risk is considered as a completely distinct risk category that includes all operational failures due to people, processes, systems or external events that can cause losses; or
- given that people, processes and systems are important elements of each risk category, operational risk is modelled as part of each risk category, with the operational risk category only consisting of the balance of operational risk not dealt with elsewhere.

Where agents use the second approach and model operational risk as part of each risk category, Lloyd's would ask that best efforts are made to split out an overall operational risk figure for use in the pro-forma which will assist Lloyd's benchmarking process.

Lloyd's recognizes that the assessment of operational risk both on a qualitative and quantitative basis is a challenging area for agents.

The implementation of a risk framework underpins both the management and measurement of operational risk. Once a basic risk framework is in place, the focus should then be on updating and maintaining the risk framework and working to ensure that it is embedded in the business. Senior management must demonstrate how their risk management framework can identify key operational risks and its link to business decision making. In measuring operational risk for ICA purposes, it is important to distinguish between risks in the risk register that are used to assist management in the day to day running of the business and those risks which, when extreme event scenarios are applied to them, result in a capital requirement.

The lack of historical operational risk data can cause some difficulty, particularly where agents are modelling operational risks. A robust approach in the absence of additional data is to perform detailed stress and scenario testing to support any available operational risk data.

Agents should be taking active steps to understand better the nature of their own risks and uncertainties over time which will result in senior management being better equipped to run their business in the context of the risks that it faces.

### **Minimum Required Standards**

Agents must consider and address, as a minimum, each of the areas listed below:

- mapping to the risk register
- categorisation
- quantification
  - an arbitrary loading will not be considered an appropriate methodology when calculating operational risk, no matter how prudent the level of capital allocated
- reliance on systems and controls
- consideration of the following specific areas where appropriate to the syndicate's business
  - delegated underwriting
  - new syndicates and/or new classes of business
  - growth

## **THE RISK FRAMEWORK UNDERPINS THE MANAGEMENT AND MEASUREMENT OF OPERATIONAL RISK**

## **AN ARBITRARY LOADING WILL NOT BE CONSIDERED AN APPROPRIATE METHODOLOGY**

**MOVEMENTS IN ONE ASSET CLASS ARE LIKELY TO HAVE IMPLICATIONS FOR OTHERS**

**LLOYD'S EXPECTS AN ALLOCATION OF CAPITAL TO MARKET RISK IN ALL ICAS**

**EVENTS OCCURRING ELSEWHERE IN THE GROUP CAN HAVE A SIGNIFICANT IMPACT ON A SYNDICATE**

## Market Risk

### Definition

Market risk refers to the risk of changes in income from or values of assets arising from fluctuations in economic variables, including interest rates and exchange rates.

### Scope

Market risk includes exposures arising from variations in exchange rates, interest rates and investment returns. Market risks tend to be inter-dependent, such that movements in one asset class are likely to have implications for other asset classes. For example, fluctuations in interest rates will usually have an impact on equities, bonds and exchange rates.

Market risk should be considered in conjunction with insurance risk, credit risk and liquidity risk.

Lloyd's considers that assets cannot be held on a basis perfectly matched to the underlying liabilities of a syndicate in both term and currency since the timing and extent of liabilities are uncertain. Consequently, Lloyd's would expect an allocation of capital to market risk in all ICAs. In particular, under extreme conditions, claims inflation is likely to exceed income from investments.

### Minimum Required Standards

Agents must consider and address, as a minimum, each of the areas listed below:

- exposures arising from variations in exchange rates, interest rates and investment returns
- the volatility of asset prices and the correlation of investment types
- the correlation between investment and insurance risk following extreme loss events
- where the expected investment return is higher than the risk free rate
- investment income/discounting of reserves

## Group Risk

### Definition

Group risk refers to the potential impact of risk events, of any nature, arising in or from membership of a corporate group.

### Scope

Agents that are part of a group should consider risks arising as a result of the group structure and operations.

Past experience has shown that events occurring elsewhere in the group can have a significant impact on a syndicate. Although many agents consider that there are capital advantages to being part of a wider group structure, reputational risks affecting the parent company can indirectly affect the syndicate.

Whilst Lloyd's recognises that group risk is not likely to result in as significant an allocation of capital as other risk categories, it is important that agents clearly explain their assessment of group risk capital

## LLOYD'S WILL EXPECT GROUP RISK CAPITAL WHERE AN AGENT IS PART OF A WIDER GROUP

requirements within their submission. Lloyd's expects some allocation of capital for group risk where an agent is part of a wider group with a common parent company or where an agent manages multiple syndicates. Agents should exclude consideration of any group risk arising from trading under Lloyd's umbrella.

### Minimum Required Standards

Where agents are part of a group they must consider and address, as a minimum each of the areas listed below:

- capital
- group reinsurance arrangements
- shared platform
- management resources

## Liquidity Risk

### Definition

Liquidity risk refers to the risk that sufficient financial resources are not maintained to meet liabilities as they fall due.

### Scope

Agents should consider the ability to manage unplanned changes in both funding sources and market conditions as well as a syndicate's access to other sources of funding and any regulatory capital tied up (eg SLTF, CRTF).

Liquidity risk should also be considered in conjunction with both insurance risk and market risk, particularly in relation to the impact that various stress and scenario tests may have on a syndicate's cash position and its ability to pay claims.

### Minimum Required Standards

Agents must consider and address, as a minimum, each of the areas listed below:

- planning and cashflow
- unexpected events
- post loss environment

## Diversification

### Definition

Diversification reduces the risk as the capital required for two or more risks taken together is generally less than the sum of the capital requirements of the individual risks. This applies at many levels – between policies in a portfolio, between different types of portfolio, across time, between risk types, and so on. It is a fundamental principle of insurance.

Dependency affects this reduction; the more interdependent the risks, the less the reduction in risk from diversification. Dependency refers to an increased probability of an event given that another event is known to have occurred. It is not necessary for there to be a direct causal link. For

## LIQUIDITY RISK SHOULD BE CONSIDERED IN CONJUNCTION WITH INSURANCE AND MARKET RISK

## DIVERSIFICATION IS A FUNDAMENTAL PRINCIPLE OF INSURANCE

example, reinsurance failure and high gross claims may be dependent because both can in some cases be caused by the same weather events; and a higher frequency of losses may present evidence that severity will also be higher, with no causal chain.

Correlation is one specific measure of dependency, but it does not capture the whole picture and in a sophisticated model the impact on “tail dependency” should be considered. In a model without explicit tail dependency, correlations should be set using appropriate judgement to reflect the dependency in the tail.

The dependency can increase in the more severe scenarios. For example, when there are large losses, higher reinsurance failure or dispute are more likely than in “normal times”. Adverse claims experience can arise in several parts of the portfolio at once, together with inadequate pricing of risks going forward.

In stress test only ICAs, a correlation approach can be used to bring together different stress tests into a total provided certain other assumptions can be justified. Other methods such as chains of potential cause and effect or “ripple effects” should also be considered, again allowing for the possibility that losses which might have little dependency in normal times can become much more dependent in adverse scenarios, and that dependency can arise even when there is no direct causal link.

As well as considering the inputs to the assessment of dependency, agents should consider the outputs, ie the effect of the chosen assumptions on the result.

### Scope

Includes all allowances for diversification. Agents will be asked to show results at certain specified levels of aggregation to allow Lloyd's to see the effect of diversification between these levels.

Within the ICA submission agents must explain fully how they have considered and addressed the following:

- the level and method of aggregation chosen must be appropriate to the basis of the ICA and the syndicate's tail risk
- agents must ensure that the post diversification number is reasonable
- an agent's own data is unlikely to be sufficient for full calibration
- stress tests are vital to substantiate assumptions

## **CORRELATION IS ONE SPECIFIC MEASURE OF DEPENDENCY**

## **AGENTS MUST ENSURE POST DIVERSIFICATION NUMBER IS REASONABLE**

# DETAILED GUIDANCE SECTION



## APPROACH AND METHODOLOGY

Irrespective of the modelling approach taken by agents, they must ensure that there is a clear audit trail from the impact of any financial calculations to the relevant risk capital allocation in the ICA. The ICA must:

- outline clearly the approach adopted in respect of operational risk
- ensure that the material risks under each risk group are identified clearly along with an explanation as to how they contribute to the ICA value
- document the way in which any risks have been incorporated in the modelled element of ICA calculations (eg by using particular assumptions or changing certain parameters)
- list significant risks where no capital has been included because the controls over the inherent risks are such that the level of residual risks is considered low enough to warrant their exclusion from capital calculations. The extent of this control reliance should be outlined and the effectiveness of these controls clearly demonstrated.

### Assumptions used in ICA

When calculating the syndicate's ICA, information regarding current and prospective underwriting must be consistent with the syndicate's SBF submission. The ICA should reflect the same management assumptions on the coming year as the business plan and the onus will be on agents to reconcile any discrepancies and demonstrate consistency with the SBF. Lloyd's will not accept an ICA where assumptions cannot be shown to be consistent with the SBF.

Agents should justify in their submission the rationale for choice of assumptions where appropriate and should clearly state where they believe these assumptions, if any, are particularly prudent.

A number of agents have queried whether adoption of prudent assumptions within the SBF has the impact of driving a higher capital requirement within their ICA. Lloyd's considers that this may have limited impact, since the ICA is considering the 1:200 confidence level and the impact of assumptions regarding the expected prospective underwriting performance is reduced when considering extreme loss events and probabilities. Prudent assumptions on prospective performance may well serve to reduce expected volatility around the "average" and be reflected in the capital assessment at the 1:200 point. The adoption of prudent assumptions will increase the credibility of the assessment, be taken into account in Lloyd's review and also support credit taken within ICAs for management action. Where prudent assumptions are adopted throughout the business, more credit will be taken by Lloyd's for prior performance in assessing the risks in the ICA.

### Time Horizon

The need for a consistent basis of calculation is particularly important for ICAs that are based on stochastic models, and in particular regarding the degree and manner to which models look beyond the immediate future year.

One year models will continue to be acceptable for the 2009 ICA submission. Lloyd's will not penalise agents who are already using a

**IDENTIFY MATERIAL RISKS AND EXPLAIN HOW THEY CONTRIBUTE TO THE ICA VALUE**

**LLOYD'S WILL NOT ACCEPT AN ICA WHERE ASSUMPTIONS CANNOT BE SHOWN TO BE CONSISTENT WITH THE SBF**

**THE ADOPTION OF PRUDENT ASSUMPTIONS WILL INCREASE THE CREDIBILITY OF THE ICA**



**ENSURE THAT ALL LIABILITIES  
COULD BE PAID AS THEY FALL  
DUE AT A 99.5% CONFIDENCE  
LEVEL**

**A ONE YEAR BASIS IS NOT  
RESTRICTED TO EXAMINING  
LOSSES MATERIALISING ONLY  
IN THE 12 MONTHS TO 31.12.09**

**CYCLE ASSUMPTIONS  
SHOULD BE SET OUT  
CLEARLY WITHIN THE ICA**

multi year model and provide a multi year number as well as a one year number provided Lloyd's is satisfied that the one year number has been prepared at the 99.5% confidence level. Where the model does not produce a one year number, Lloyd's can assist in deriving this.

**One year time horizon**

Agents must calculate the capital required to ensure that all liabilities attaching to the 2009 and prior years of account could be paid as they fall due at a 99.5% confidence level. In these cases, they should use a prudent best estimate basis but should then apply stress tests to their assumptions to allow for the risk of softening rates.

Future liabilities should include claims payments, future expenses and future reinsurance costs, on an ultimate basis. Future reinsurance costs can recognise a syndicate's status as a going concern where it is expected, for instance, that losses occurring during (LOD) reinsurance costs in 2010 will be met partially by the 2010 year of account.

All underwriting and reserving risk must be modelled to ultimate for all risks attaching to the 2009 and prior years of account. A one year model only excludes risks attaching to 2010 and future underwriting years of account compared to a multi year model. A one year basis is not restricted to examining the 1:200 confidence level of losses materialising only in the twelve months to December 2009.

Allowance may be made for asset returns over the payment period, and these should be assessed allowing for asset and timing risks (to the extent that these are not included in the non-insurance headings of the ICA).

The key risks that need to be addressed are:

- that the market cycle softens, increasing the level of capital that is needed at the 1:200 level for a given volume of business
- that the syndicate suffers a moderate loss and needs to replenish its capital support or constrain its future plans

In both cases, the issue of raising fresh capital to support the syndicate's status as a going concern may be important.

Accordingly, the ICA should be constructed to include recognition of the position in the insurance cycle. This may be achieved either by sensitivity tests or by appropriate assumptions regarding the insurance cycle in the model itself. All assumptions must be clearly stated. These two approaches are described briefly below:

- **Sensitivity testing approach** - the agent should consider the immediate future year and apply sensitivity tests to this result; this is described as the "one year time horizon"
- **Modelled approach** - the agent should model what the ICA is likely to be in future years and demonstrate that it would either be able to raise capital or adapt its business plan to reduce risk if the ICA is likely to increase. This approach is referred to as having a "multi-year time horizon"

**Multi Year Time Horizon**

Since a multi year model is not required at present, Lloyd's has not set out a required basis for such a model. Agents intending to use or develop multi year models should ensure that they contact Lloyd's to discuss this.

## Modelled Approach

The following comments relate to stochastic models.

### Loss modelling

The level of detail adopted in the modelling of losses should be appropriate to the characteristics of the underlying business. All major classes of business should be explicitly modelled. Territories or currencies should also be modelled separately if the size of the group warrants this. Within each class, it is common for models to split loss modelling between attritional losses, large claims and catastrophe claims, although for smaller syndicates or where the risk in the class is incidental, then consolidation of these groups may be appropriate. For example, attritional losses may follow an aggregate claims distribution, whilst large claims and catastrophe losses could be split between a frequency and claim amount distribution.

Lloyd's recognises that there are a variety of statistical distributions that may be used within the ICA model and agents are expected to consider a range of alternatives when parameterising their models. The chosen statistical distribution should have an appropriately heavy 'tail'. A normal (Gaussian) distribution may not be appropriate for aggregate losses or claim amounts. Similarly, a Poisson distribution for frequencies may be considered to be too thin-tailed and a negative binomial may be more suitable. Agents should be aware that they may be asked to sensitivity test their choice of distributions and should provide justification and rationale within the ICA for the distributions chosen and why they are deemed to be appropriate, particularly where the choice of an alternative distribution would have a significant effect on the total ICA.

Agents should consider the assumptions made within the ICA in aggregate, as well as at a more detailed level. Lloyd's recognises that there are a variety of approaches that may be taken when selecting parameters and distributions for individual components of the ICA model.

There are many instances where an agent selects from a range of reasonable assumptions. Where Lloyd's considers that the ICA is based consistently on selection from the optimistic end of each range, this could lead to a concern at the aggregate level. As well as justifying the selection of assumptions relating to these individual components, agents should ensure that the ICA is sufficiently prudent when assessed in total and discussion of the aggregate level of prudence within the model should be included within the ICA. A model in which the approach chosen for every individual component could be considered to be the least prudent of a number of options is unlikely to produce a number which is acceptable in aggregate.

Direct use of external catastrophe models, incorporating stochastic event catalogues is good practice. However, the ICA should allow for the possibility of model error and for events not included within the catastrophe model catalogues. Actual loss experience in 2005 highlighted that catastrophe models alone are not always sufficient.

External catastrophe models tend to focus on certain types or elements of natural catastrophes only. Syndicate ICAs should not understate the potential exposure from other natural catastrophe events, liability or man-made catastrophes.

**AGENTS ARE EXPECTED TO CONSIDER A RANGE OF ALTERNATIVES WHEN PARAMETERISING MODELS**

**AGENTS SHOULD CONSIDER IN AGGREGATE THE EFFECT OF CHOSEN ASSUMPTIONS ON THE ICA VALUE**

**ICAs SHOULD INCLUDE EXPOSURE TO CATASTROPHE EVENTS NOT INCLUDED IN MODELS**

## **AGENTS SHOULD INCLUDE DETAILS OF LOSS MODELLING SOFTWARE USED AND HOW ADAPTED**

The implied distribution should be consistent with the syndicate's realistic disaster scenario (RDS) submission and with the SBF submission.

Lloyd's recognises that different catastrophe models are in use across the market and agents should include within their submission details of the model used as well as how this has been adapted to suit their particular exposures. Details should include:

- modelling software used and version number
- any alterations made to standard model assumptions and settings
- details of data used in model and any alterations made for planned 2009 underwriting

Lloyd's will also look for an analysis of the output of the model against actual loss experience and the use of models by agents in their business.

### **Parameter Setting**

To enable Lloyd's to review an ICA sufficiently, the submission should contain information as to how parameters have been chosen together with the logic of the model that brings the assumptions together. The choice of parameters should be carefully considered by agents and analysis should be sufficiently tested.

There will be sensitivity of results to various parameters and agents should highlight within their ICA the key parameters driving the result.

Whilst agents should seek to use a syndicate's own data to parameterise the model, in most cases this data is unlikely to have sufficient statistical credibility in terms of both size and history. Reference to market data will often be required, adjusted to reflect syndicate specific characteristics. As noted below, when assessing volatilities (standard deviations) at a market level, adjustments should be made to reflect that the observed market volatility for a class of business, representing the pooled experience of many syndicates, will tend to be lower than the volatility of a stand-alone syndicate.

Whether the parameters have been based on a syndicate's own historic data or market data, the ICA submission should contain details of the analysis undertaken and where and how judgement has been used. The ICA should also contain an explanation as to the relative balance between the syndicate's own data, market data and judgement.

Models are based on past experience and it is likely that over time this experience will become out of date due to all manner of trends. When such trends start to emerge, agents should consider their impact on the results. It is not acceptable to wait until the effects of the trend are well understood before commenting on the possible implications. Agents should consider the validity of past data and assumptions within the model and ensure that these remain appropriate for calibration, particularly with regard to actual experience (eg following the 2005 US windstorms).

Agents must consider scientific evidence on climate change with regards to parameter setting. The ICA should explain where this has been considered and has resulted in a change of parameters being used. With specific reference to the influence of climate change on US hurricane risk there is currently no consensus amongst catastrophe modelling agencies. However, there is strong evidence that hurricane risk in the North Atlantic is raised above long term averages. If a long baseline view is being

## **THE ICA SHOULD HIGHLIGHT THE KEY PARAMETERS DRIVING THE RESULT**

## **AGENTS SHOULD CONSIDER THE VALIDITY OF PAST DATA AND ASSUMPTIONS**

## MODELLING APPROACHES USED FOR UNDERWRITING/PRICING AND CAPITAL SETTING SHOULD BE CONSISTENT

utilised, managing agents should consider and assess any additional capital at risk arising from this more optimistic approach in comparison with a near term view. Managing agents should provide commentary to address this specific point.

Lloyd's would expect to see consistency between the modelling approaches used for underwriting/pricing and capital setting. Further specific reference is made to catastrophe modelling considerations on pages 40-41 of this guidance document.

### Credibility of syndicate data

Agents should consider carefully the extent to which they may be overstating the credibility of their own experience, and where the model parameters are driven largely by the syndicate's own experience, a margin in the parameters will often be appropriate. Alternatively, the parameters should reflect a wider market experience.

Credibility applies not only to history, but also to the size of the dataset. Small syndicates, in particular, may not have the scale to have a credible dataset, and should not place over reliance upon their own data.

It is worth noting two technical points that are frequently mistaken when setting parameters:

- a smaller portfolio will have a larger standard deviation (SD), as a percentage, than will a larger portfolio. As a result, the SD of a syndicate should be set higher than the observed SD of the whole market. This is the principle of pooling or the law of large numbers. It affects not just the SD itself but also the estimate of the mean (average), which is more uncertain for a small portfolio
- if observations are not independent then the usual formula for the SD needs to be amended. If (and this is likely to be a key hypothesis supporting the use of syndicate specific data) the observations are positively correlated with each other, the estimate of the SD will be too low unless the formula is adjusted.

As a rule of thumb, a 10% correlation results in a 5% underestimate of the standard deviation and a 50% correlation results in a 30% underestimate.

### Parameter uncertainty

A statistical model, at best, is a fair representation of the underlying reality. At worst it is a biased and incorrect view of the risk. Invariably, there is insufficient data to be totally confident of the parameters or model, and some degree of parameter and model error is unavoidable. To compound matters, parameters themselves may not be fixed and might follow their own distribution. Sophisticated ICAs will therefore include some allowance for parameter uncertainty.

This is clearly an area that is difficult to quantify. However, Lloyd's considers it is important that syndicates recognise the issue and that the uncertainty is adequately communicated to senior management and addressed within the ICA.

As part of embedding the ICA process Lloyd's considers it appropriate for agents to review regularly the key parameters to ensure their continued applicability. Examples of the types of modelling uncertainty that should be explicitly considered include:

## ICAs SHOULD INCLUDE ALLOWANCE FOR PARAMETER UNCERTAINTY

**USE OF PRUDENT ASSUMPTIONS  
IN ONE AREA SHOULD NOT BE  
USED TO OFFSET AREAS OF  
OPTIMISM ELSEWHERE**

- **Parameter error** – ie the error of selecting the incorrect parameter due to insufficient relevant historical information
- **Simulation error** – ie the potential for producing erroneous results because they have used a limited set of random numbers
- **Reserving error** – the extent to which any potential historic under-reserving has resulted in over-optimism on the new business projections
- **Model error** – ie the error in output caused by matters such as incorrect distributional or aggregation assumptions

Lloyd's considers it important for agents to test the key assumptions for reasonableness. This would enable a broad high-level reasonableness assessment of the parameters, and indicate potential areas of significant under/over estimation. The submission should also give commentary on the potential parameterisation error and model error, stating what adjustments have been made to cover such errors.

Agents should highlight within their submission any assumptions or areas of modelling which are deemed to be prudent. However, where agents are aware of areas of weakness or optimism in the submission, these should be explicitly addressed. Agents should not make a general statement that these are offset by prudence elsewhere.

Lloyd's considers that there are risks in using a "smoothed" dataset as it is likely to contain "survivor bias" and may lack the extremes that should drive the ICA assumptions.

The ICA should also demonstrate that sufficient sensitivity tests of the model have been carried out and that these sensitivities are understood by the Board and senior management. Lloyd's may also request the overall loss distribution of the model as part of its ICA assessment.

**PROVISION OF MODEL  
OUTPUT AT VARIOUS  
PERCENTILES WILL AID  
LLOYD'S REVIEW**

Agents are requested to provide details of ULRs at a best estimate and 1 in 200 level for the ICA submission pro-forma summary. In addition, agents may wish to incorporate further detail within their submission, for example, they may choose to provide the ULR at a range of different percentiles, or provide the percentile at which the ULR reaches 100%. A feature of a good model is that the output at various percentiles should look intuitively reasonable and have a sound business logic. Provision of such information may help to demonstrate the robustness of an agent's modelling approach and will aid Lloyd's review of the ICA.

**Features of a 'good' stochastic model**

A good stochastic model should:

- have all parameters clearly identified and justified
- be structured and documented so that it can be understood by senior management and Board members who do not have actuarial expertise
- be rigorous and self-consistent
- be consistent with realistic adverse scenarios
- reflect actual circumstances of the syndicate
- be sufficiently detailed to deal adequately with the key risk areas and capture homogenous classes of business, but not excessively complex
- be capable of being run with changed parameters for sensitivity tests

**STOCHASTIC MODELS  
SHOULD HAVE ALL  
PARAMETERS CLEARLY  
IDENTIFIED AND JUSTIFIED**

- where simulations are used, include at least 10,000 (so at least 50 simulations exceed capital level). Agents should ensure that the number used produces a stable result and ideally more than 10,000 should be used
- have a robust software platform

Agents seeking guidance on sensitivity testing the number of simulations used in their models should speak to their team leader who will be able to share with them some of the work carried out internally at Lloyd's on the convergence of various distributions. A short paper which discusses various algorithms which can be used to determine the number of simulations required for a desired level of accuracy in the simulated result can be made available to those interested.

## Stress and Scenario Test Approach

Where agents rely on individual stresses and scenarios to derive an ICA, or to substantiate the output of a model, these should be based on the risks identified and documented in their risk register. The more complete, accurate and embedded the risk register, the more Lloyd's will be able to take comfort from the scenarios selected.

Agents should ensure that the stress and scenario tests used are at a suitably extreme level for determining a 1:200 capital assessment and are at a consistent level to allow aggregation.

Stress and scenario tests should be based upon a detailed analysis of potential outcomes within a scenario. One of the weaknesses in adopting a solely stress and scenario testing approach is in the aggregation of risks to arrive at an overall capital figure.

Two common approaches to reflect aggregation of risk are:

- specification of a correlation matrix between each scenario
- 'ripple effects'

Under the first approach, a range of stress tests is considered and quantified in isolation. A correlation matrix is then specified between risk categories/stress tests (judgementally: high/medium/low correlation) and then aggregated to derive an overall capital figure.

Under the second approach a range of scenarios is chosen, and for each one the associated 'ripple effects' resulting from that scenario are also quantified (eg a large loss event leading to reinsurer failure). An extension of this approach is a 'cause and effect' table, where for each defined scenario, the knock-on effect of losses from other pre-defined events is also derived. However, because dependency does not require cause and effect, a cause and effect approach is unlikely to be sufficient without adjustment.

Aggregation of scenarios will depend on the complexity of the stress tests. In some cases, using the maximum value of the scenarios may be appropriate, or alternatively aggregation may be achieved through a correlation matrix approach. This issue is covered in more detail in the section on diversification.

**STRESS AND SCENARIO  
TESTS USED MUST BE AT A  
SUITABLY EXTREME LEVEL**

**A ROBUST STRESS AND  
SCENARIO TEST  
APPROACH SHOULD  
COVER ALL RISK ASPECTS**

**Features of a robust stress and scenario approach**

A robust stress and scenario test approach should:

- ensure that stress tests cover all risk aspects
- ensure that stress tests used are severe enough at the 1:200 level otherwise combination of less severe impacts must be aggregated (eg two 1:15 events occur in the same year)
- allow for dependencies (eg gross loss and reinsurance failure)

## INSURANCE RISK

This section sets out the technical issues to be considered within insurance risk. It has been split into three sections to cover underwriting risk, reserving risk and reinsurance issues linked with insurance risk.

The minimum standards section of this document combines the minimum standards which are equally relevant to both underwriting and reserving risk under the heading of insurance risk. However, as the detailed explanation for each of these will vary, they have been repeated under the headings of both underwriting and reserving risk below together with the relevant explanation.

### Underwriting

For each syndicate class of business, the ICA should contain an analysis of potential exposure to large individual and catastrophic event losses (severity) as well as the potential for adverse loss experience (frequency). The analytical approach should be consistent for both existing and new syndicate classes of business and the method of calculation should be clearly indicated.

The ICA should also contain a breakdown of SBF gross and net ultimate loss ratio (ULR) projections between large individual, catastrophic event and attritional losses. The assumptions used in the ICA must be consistent with those used in the SBF. It should be noted however that for the purposes of the 2009 ICA submission pro-forma summary (Appendix 3), both the mean and the 1:200 ULRs are requested on the basis that they should include both business written in 2009 and business written in prior years of account but unearned as at 31 December 2008. For this reason, the mean ULR shown on the pro-forma will differ from that shown in the SBF and agents are therefore requested to provide a reconciliation of the mean ULR between that in the pro-forma and that in the SBF in order to confirm that they have been prepared on a consistent basis.

#### Underwriting cycle

Agents should explain how their ICA reflects the cycle including variability in premium rates, terms and conditions.

At the current point in the insurance cycle, there is considerable uncertainty about the strength of the market in 2009. Agents should allow for this pricing volatility in their ICA as well as claims volatility. Lloyd's anticipates that the underwriting risk element within ICAs will increase as a proportion of premium during a softening market.

Agents should recognise the limitations in predicting prospective underwriting from prior performance. Where historical performance has been poor, agents have generally made strong representations regarding management actions taken and make the case that the link from previous results is limited – a similar assumption may be made for good performance to an extent, as conditions, management etc change. The relevance of superior performance to expected results is further limited when considering the extreme loss scenarios at the 1:200 confidence level and beyond.

Where an ICA makes limited allowance for the underwriting cycle on the basis that management will take appropriate actions to mitigate this risk, agents should demonstrate that the assumed actions will occur,

**THE ICA SHOULD INCLUDE THE RISK OF CAT LOSS (SEVERITY) AND ADVERSE LOSS EXPERIENCE (FREQUENCY)**

**PRO-FORMA ULRS SHOULD INCLUDE BOTH BUSINESS WRITTEN IN 2009 AND UNEARNED PREMIUM AT 31.12.2008**

**UNDERWRITING RISK ELEMENT WITHIN ICAS IS EXPECTED TO INCREASE AS A PROPORTION OF PREMIUM**



**ICAs SHOULD ADDRESS THE RISK THAT THE CYCLE SOFTENS MORE SEVERELY AND QUICKLY THAN ANTICIPATED**

particularly where historic performance has indicated otherwise. The ICA is set at the 1:200 confidence level and at this extreme point of the range of outcomes, the ICA should carefully consider any level of credit that may be taken for management intervention, in view of survivor bias and the difficulty in assessing their own ability to respond at this level of severity.

Agents should also address the risk that the underwriting cycle softens more severely and more quickly than anticipated. This should include consideration of the impact of competitors seeking to diversify into new areas of business as increased competition in such classes may hasten the cycle effect.

Agents should also consider the cycle implications where business is underwritten through binders or other types of delegated underwriting authorities which could be incepting policies for up to twelve months beyond the ICA date.

**Unearned profits**

There will be a combined challenge from Lloyd's on the underwriting assumptions used in the SBF and the ICA. In particular, Lloyd's will be looking closely at the ULRs being used both on a reasonable and prudent estimate of expected performance and at the 99.5% confidence level. The FSA does not automatically allow credit for future profits within ICAs and where any such credit has been included they expect it to be fully explained and rationalised. Future profits in this context includes both profit on business expected to be written in 2009 and profit on business written prior to 2009, but unearned as at 31 December 2008.

Any offset within the ICA for unearned profits must be consistent with SBF loss ratios. Whilst these ULRs may lie within an acceptable range, agents should consider the uncertainty around them when assessing the ICA at the 1:200 level, particularly where there is significant profit offset.

In reviewing this area Lloyd's will look at a syndicate's performance history and also consider the impact of major losses on assumptions used.

**Reasonableness checks on extremity of gross and net ULRs at 1:200 confidence level**

A key focus of Lloyd's review will be on gross and net ULRs at the 1:200 level. Agents will be expected to "sense check" the output of their models and Lloyd's will not expect syndicates to maintain profitability at the 1:200 level.

Agents should also consider the gearing effect of any movement in the mean ULRs on capital at the 1:200 level as shown below:

<b>Example:</b>	<b>£m</b>	<b>£m</b>	<b>% increase</b>
Premium	100	100	n/a
Excess of 99.5% loss over mean	70	72	3%
99.5% loss	140	147	5%
ICA	40	47	<b>18%</b>

**THERE WILL BE A COMBINED CHALLENGE FROM LLOYD'S ON THE ASSUMPTIONS USED IN THE SBF AND THE ICA**

**LLOYD'S WILL NOT EXPECT AGENTS TO MAINTAIN PROFITABILITY AT THE 1:200 LEVEL**

When deriving ULRs to be used at the 1:200 level agents should ensure these are sufficiently extreme and should:

- review actual extreme events – state assumed return period and basis for extrapolation
- compare two events at 1:15 or three at 1:6 and consider aggregating these
- refer to scientific views re catastrophes
- consider extreme value theory
- apply prudent standard in view of uncertainty

#### **Breakdown of gross and net ULRs between catastrophe, large and attritional losses**

Lloyd's would like to understand how important these different components are in the overall assessment whilst recognising that the relative impact will differ depending on the portfolio. Within the ICA submission and as part of the summary pro-forma information required, agents will need to show clearly the breakdown of both gross and net ULRs between catastrophe, large and attritional losses.

Many modelled ICAs have different modelling components for attritional, large and catastrophe claims. It is the responsibility of the agent to ensure that the definition of the modelling components is suitable for the business underwritten although Lloyd's can provide some guidance in this area if required.

In principle this means assessing the average contribution of each component, and this is not possible when there is only one set of simulations - the single simulation that is at the 99.5% VaR point is just a sample of one, from which no useful information can be gleaned. To assess the relative contributions agents may consider other approaches and some suggestions are:

- run several sets of simulations using different random seeds
- consider the effect of making small changes to the separate components (eg different attritional ULRs, different large claim severity assumptions, different catastrophe frequency assumptions) on the overall model result
- consider TVaR above 99.5%, or average losses (eg between 99.4% and 99.6%)
- use of judgement - if the models have been parameterised separately then agents should have some information on relative risks
- use of stress tests

Lloyd's recognises that in practice, it will probably be necessary for agents to consider several approaches and exercise judgement in splitting out these components.

#### **Breakdown of premium movements**

Agents are required to address within the ICA details of premium movements and in particular, to show clearly those which are driven by a change in exposure versus those which are linked to rate changes. This analysis relates to movements between the 2008 assumed premium as per the latest 2008 ICA submitted to Lloyd's and the planned 2009 premium used in the 2009 ICA and SBF. It should not reflect any updated

### **AGENTS WILL NEED TO SHOW BREAKDOWN OF ULRs BETWEEN CATASTROPHE, LARGE AND ATTRITIONAL LOSSES**

### **AGENTS MUST SHOW CLEARLY THE SPLIT BETWEEN RATE MOVEMENTS AND EXPOSURE CHANGES**

premium estimates for 2008 in the latest SBF submission as this is not the basis for previously agreed capital.

#### **Growth through additional exposure**

In addition to growth through new classes of business, agents should also consider growth via increased line size or additional policy count.

Where a book of business has been written for some time on a particular scale, the experience may be unsuitable for setting parameters to measure the risk associated with the same book of business written on a larger scale. Agents should recognise the limitations which this places on historical performance:

- where the line size increases, volatility may also increase
- if different layers are written, this will affect risks
- it may be difficult to obtain more business of the same quality ("niche" advantage lost)
- different insureds may enter the portfolio
- control of the larger scale operation may not be possible (or not as good) using the same approach as was successful for a smaller book (eg underwriter may no longer be able to consider all risks individually)
- agents should also consider that growth occurs in a softening market

Where any such growth is outside the agreed business plan, agents must submit a new SBF and ICA to Lloyd's.

#### **Unexpired risks on 2008 and prior years of account (YOA) and 2009 YOA risk**

In order to produce a consistent split of ICAs, agents are requested to treat all unearned exposure together with new underwriting or underwriting risk. Lloyd's recognises that some models may group exposure by underwriting year so this split may be difficult but would ask agents to make best efforts to treat exposure on this basis to enhance comparison across ICAs.

#### **Catastrophe losses**

Syndicate ICAs should reflect catastrophe loss potential to all the peak exposure accumulations within the syndicates' portfolios, not just those represented by the current RDS framework. When using a scenario-based approach, managing agents are reminded to consider the potential for multiple events in a given year. The catastrophe scenarios should represent sufficiently extreme events, or combinations of events to be relevant to requirements at the 99.5% percentile (which may be beyond the level of some of the existing RDSs). Managing agents using a scenario-based approach should explain the rationale for the selection of the scenarios used.

External catastrophe models tend to focus on natural catastrophes, and only for a limited set of classes of business and territories. Syndicate ICAs should not understate the potential exposure from other natural catastrophe events, liability or man-made catastrophes, nor the potential contribution to catastrophe losses from unmodelled classes of business.

The implied distribution should be consistent with the syndicate's RDS submission and with the SBF submission.

### **WHERE GROWTH IS OUTSIDE THE AGREED BUSINESS PLAN, AGENTS MUST SUBMIT A NEW SBF AND ICA**

### **SYNDICATE ICAs SHOULD CONSIDER THE POTENTIAL FOR MULTIPLE EVENTS IN A GIVEN YEAR**

Lloyd's recognises that different catastrophe models are in use across the market and agents should include within their submission details of the model used as well as how this has been adapted to suit their particular exposures. Details should include:

- modelling software used and version number
- which perils have been modelled, and where geographically (e.g. US windstorm, Japanese earthquake)
- any alterations made to standard model assumptions and settings
- details of data used in model and any alterations made for planned 2009 underwriting

Lloyd's will also look for an analysis of the output of the model against actual loss experience and the use of models by agents in their business.

#### Lloyd's Realistic Disaster Scenarios confidence level

Lloyd's RDSs are a well established means of monitoring catastrophic loss potential within syndicates and across the market as a whole. However, there are some aspects of their basis and design that may need to be adapted by agents when developing suitable stress and scenario tests to support their ICA assessment.

The RDS framework is a deterministic one and the scenarios are not selected according to return period criteria. A given event can appear in very different places on different syndicate exceedance probability curves, depending on their portfolio mix and may not be at the required confidence level for individual syndicates. In particular, it is expected that more targeted and/or more extreme scenarios will be used by agents where their exposure is markedly different from the insurance industry's. Agents must adapt or combine their RDSs for use in the ICA to achieve a sufficiently extreme level of confidence and be able to demonstrate the rationale for the level chosen.

A full test of exposures in a particular region is best supported by a probabilistic assessment against a full range of possible events. It is for this reason that syndicate exceedance probability curves are more appropriate.

Although a probabilistic approach can be applied to natural catastrophe risks, it is not practical to model against a full range of possible events for those risks where belief and opinion underlie the assessment of likelihood. Instead, careful consideration should be given to ensuring that the selected events are focused on the actual exposure profile of the syndicate. A number of the 'de-minimis' RDSs and the two 'alternative' RDSs, in particular require agents to identify and test their syndicates' peak exposures.

#### Parameter setting and climate change

Agents should also take account of the recent industry and meteorological studies into the effects of sea temperature, the current cycle of hurricane development, and possible dependence between one or more hurricanes occurring on similar paths.

The ICA should consider scientific evidence on climate change with regards to parameter setting and the ICA should explain clearly where this has been considered and any resulting change in parameters being used.

**AGENTS MUST ADAPT OR COMBINE THEIR RDSs TO MEET 1:200 CONFIDENCE LEVEL REQUIRED FOR ICAs**

**THE ICA MUST CONSIDER SCIENTIFIC ADVICE ON CLIMATE CHANGE AND EXPLAIN EFFECT ON PARAMETER SETTING**

## **LARGE LOSS PARAMETERS USED MUST BE SUFFICIENTLY SEVERE AND REFLECT EXPERIENCE**

### **Large individual risk losses**

Agents should ensure when assessing large claims that the parameters used are sufficiently severe and reflect both their own experience and benchmark data. Historical experience can be used where relevant, with allowance for terms and conditions as well as inflation.

### **Attritional loss experience**

Syndicate ICAs should address separately the risk of experiencing adverse loss ratios as a result of:

- higher than expected claims frequency and/or severity
- underpricing
- a combination of the above
- emergence of new types of claim which fall within policy wordings

When projecting attritional claims, agents must consider the extent to which inflation, rate changes, definition of large claims and other external factors can impact the historic development data. Where an ICA has implicitly assumed that the volatility of future inflation will be in line with that in the historic data, this should be supported by clear examples on how appropriate this assumption is.

### **New syndicates and/or new classes of business**

Where a syndicate is new or is planning to underwrite a new class of business, the additional risks associated with this should be considered. The level of risk and the associated capital requirement will depend on the circumstances of the acquisition of this new business for example:

- moving a portfolio from another part of the group to the syndicate (lower risk)
- recruitment of complete underwriting team and book of business from another syndicate (medium risk)
- new syndicate set up through existing managing agent with effective risk management framework and controls in place (medium risk)
- completely new to syndicate, underwriters, independent reviewers and senior management with disparate elements and a new book of business to be established (higher risk)
- entirely new set up/new managing agency with no existing framework and systems in place (very high risk)

Each of these will present different levels of challenge and therefore risk to the syndicate and the ICA should reflect this.

In assessing the additional capital requirement, the parameters used should reflect the appropriate level of uncertainty and risk. Lloyd's would expect agents to allow specifically for the increased uncertainty in the best estimate loss ratio and also consider the additional volatility in arriving at an estimate of a 1:200 outcome. Where little or no historical data exists agents should consider carefully the risk of mispricing and also potential mismatching on reinsurance. In at least the first year of underwriting new business, agents should consider carefully whether it is appropriate to take any diversification credit within underwriting risk for such new business.

## **AGENTS SHOULD ALLOW FOR THE INCREASED UNCERTAINTY IN THE BEST ESTIMATE LOSS RATIO**

## **LLOYD'S WILL EXPECT NEW CLASSES OF BUSINESS TO INCREASE THE OVERALL CAPITAL REQUIREMENT**

Lloyd's will expect new classes of business to increase the overall capital requirement. Any resulting diversification credit from new classes of business should not override the additional capital for other associated risks.

### **Application of reinsurance programme**

The ICA should contain details of the gross and net basis, with both gross and net extreme losses explicitly considered. The ICA should provide details of the variability of net losses having regard to the application of the reinsurance programme (see separate reinsurance section within insurance risk).

Agents should consider the difference between the gross and net figures at this extreme level to ensure that the reinsurance programme is adequate.

### **Operating expenses**

Syndicate ICAs should address potential exposure to financial loss from higher than expected costs and expenses not directly related to claims.

### **Use of syndicate data and benchmarking**

Whilst agents should seek to use a syndicate's own data to parameterise the model, in most cases this data is unlikely to have sufficient statistical credibility in terms of both size and history. Reference to market data will often be required, adjusted to reflect syndicate specific characteristics.

### **Allowance for trends such as inflation**

Agents should consider these trends, not only at best estimate level, but also where there is a deterioration of the trends.

### **Dependence between underwriting years**

Agents can consider all years together or look at individual years separately. In either case, the ICA should allow for dependence between years and a total figure for all years is required.

### **Operational risks associated with underwriting risk**

Agents should include an explanation of how operational risks associated with the following have been addressed when assessing underwriting risk:

#### **Risk of mispricing and time required to identify and rectify**

Agents should consider the risk of mispricing and its consequences elsewhere before it is identified, eg:

- inadequate reserves are generated from incorrect pricing
- losses emerge with a large amount of business exposed - the syndicate may already have incurred reinsurance costs and therefore business continues to be written at a price which is too low and without adequate reserves

## **REFERENCE TO MARKET DATA WILL OFTEN BE REQUIRED**

## THE ICA SHOULD EXPLICITLY ADDRESS RISKS ASSOCIATED WITH DELEGATED UNDERWRITING AUTHORITIES

### Operation of binders and delegated underwriting authorities

Where part of a syndicate's book of business is underwritten through binders or other types of delegated underwriting authorities, agents should explicitly address the risks associated with this in the ICA, eg:

- agent may not be aware of poor experience and binder continues (eg renews at 1 January and new policies enter until 31 December). This leads to syndicate exposure continuing until 31 December of the following year and the possibility that the binder continues to deteriorate
- cessation of a poorly performing binder can exacerbate the situation and may pose a "moral hazard" where risks continue to be written in the knowledge that binder will not be renewed

Agents should also consider the effects of multi-year deals and reinsurance matching on delegated underwriting authorities.

### Controls around underwriting (eg pricing tools, exposure monitoring)

Agents should address the operational controls around underwriting. In particular, inadequate price or exposure monitoring can lead to the syndicate writing too much inadequately priced business. This in turn can lead to inadequate pricing and/or insufficient reinsurance cover being purchased.

### Timeliness of management information (eg reporting of binder income and losses incurred)

Agents should consider the reporting and procedures in place for monitoring loss development, binder income etc and any potential time delays in being aware of significant risks arising.

### Modelling at a sufficiently granular level

Agents should ensure that modelling of risks is at a sufficiently granular level to capture homogenous classes of business.

## Reserving

Agents should consider carefully the risk of deterioration of prior year reserves within the ICA. When assessing reserving risk agents should consider the exposure to potential reserve deterioration and consider all aspects of the reserve portfolio individually.

### Modelling (eg bootstrapping)

Reserving risk parameters are often measured using actuarial analyses such as "bootstrapping", although it is not essential to take this approach. Even where there is an actuarial analysis, stress tests on reserves should be performed. A pure actuarial model such as bootstrap is not sufficient on its own and agents should consider the following if using a model:

- add in shock losses
- benchmark, allowing for size of portfolio
- consider gross volatility as well as net (as a benchmark)
- measure and either justify or adjust implied volatility at year end overall level

## A PURE ACTUARIAL MODEL SUCH AS BOOTSTRAP IS NOT SUFFICIENT ON ITS OWN

**AGENTS SHOULD NOT  
DEPEND ON OUTPUT OF  
STOCHASTIC RESERVING  
METHODS ALONE**

Agents should also be aware of the work carried out by the Institute of Actuaries' General Insurance Reserving Oversight Committee which has set up a Working Party looking at numerical simulation testing of currently used stochastic reserving methods. The observations of the Working Party to date suggest that some of the stochastic reserving methods which are in common use may break down at the extreme percentiles considered within a capital setting context, even when the assumptions made by the methods hold. The paper by the Working Party, 'Best Estimates and Reserving Uncertainty', contains details of these findings and is available from the Institute's website.

Given these observations to date, Lloyd's would like to further emphasize the need for caution when using any stochastic reserving technique and to stress that agents must treat the output of such stochastic methods only as one part of the overall assessment of reserving risk and not depend on it without further adjustment or consideration. Agents should ensure that they include sufficient justification for the level of reserving risk within their ICA, particularly in light of the potential shortcomings of the stochastic methods referred to above and provide detail of any adjustments made. Agents should also be aware that Lloyd's may ask for further information relating to reserving risk, for example, results at different percentiles or the outcome of particular stress tests.

Where data is adjusted to remove anomalies or ceased classes of business, there are two important shortcomings:

- data for any continuing business will contain "survivor bias"
- if data is smoothed, the situation is likely to be exacerbated since "smoothed" data lacks the extremes that should drive the ICA assumptions.

**A "SMOOTHED" DATASET IS  
UNLIKELY TO BE APPROPRIATE  
TO ASSESS RISK OF RESERVE  
DETERIORATION AT 1:200 LEVEL**

Lloyd's considers that a "smoothed" dataset is unlikely to be appropriate since any dataset with adjustments will not capture the volatility required for extreme reserve deteriorations.

It is acceptable to measure reserve volatility using actuarial analysis of the syndicate's own data. However, this data is unlikely to contain examples of 1:200 reserve deterioration so agents need to adjust and consider other sources. One approach is to add in "as if" losses and explain clearly the basis and rationale for these and choose parameters, not just measure and use blindly. Another is to boost model output accordingly.

Agents should also check that the implied deterioration is large compared to actual failures elsewhere (eg: in failed companies).

**Reserve margins**

Where best estimate reserves are used as the basis for the ICA, these may, or may not, be the same as the booked reserves. Where a syndicate is assuming a best estimate below the booked reserves, Lloyd's will require evidence that the implied surplus is appropriate.

Lloyd's will only allow up to 50% of the margin held over best estimate reserves to be offset within the ICA. Any credit taken may only be offset against reserving risk, pre-diversification and should take no account of discounting.

**LLOYD'S WILL ONLY ALLOW  
UP TO 50% OF ANY RESERVE  
MARGIN HELD TO BE OFFSET  
WITHIN THE ICA**



**Example (assuming 50% credit allowed):**

	<b>£m</b>
Held reserves (undiscounted)	120
Best estimate reserves (undiscounted)	100
Implied margin	20
<b>Offset against reserving risk</b> (pre-diversification)	<b>10</b>

Lloyd's considers it inappropriate to allow credit for more than 50% of reserve margins for the following reasons:

- Lloyd's considers that an assumed surplus in reserves is simply one estimate of future liabilities compared to another estimate held internally. Margins held typically cover genuinely foreseeable claims development rather than being explicit surplus within reserves.
- The reserve margin is not a fully fungible asset, unlike capital and may change in the event of adverse claims development. This potential for movement in the level of the margin, together with the fact that any margin arising on previous years of account could not readily meet losses on 2009 underwriting, means that the margin has less "quality" than cash. In addition, Lloyd's has limited control over releases of such margins post agreement of the ICA and therefore Lloyd's will not treat them in the same way as an asset or permit a bottom line adjustment to the ICA.
- Economic capital is set by uplifting syndicate ICAs. Whilst recognising that diversification affects the credit, if the only risk faced by a syndicate was reserve risk (and this is where the reserve margin is relevant), a credit for 50% when uplifted by the current 35% gives the benefit of 67.5% of the margin at the ECA level. Should an agent remove the margin and declare additional profits, tax would become payable. This is in line with the 67.5% recognition above.
- Lloyd's recognises that syndicates may choose to hold reserve margins for various reasons e.g. stronger balance sheet, positive rating factor etc. and Lloyd's does not wish to discourage prudent reserving. However, it is , either in the syndicate PTF or at member capital level and this is one reason why a business is seen as prudent. If Lloyd's permitted full credit for reserve margins, any such prudence would immediately be removed.

Where an agent seeks to allow for margins within the ICA, there will be an added burden of proof on the agent to substantiate any credit taken. This burden of proof increases yet further with respect to classes with significant reserves as a proportion of ultimate claims. Lloyd's will examine assumptions with great attention and agents should ensure:

- there is clear identification of any margins against those risks that are included in the measurement of capital and of the capital required where those margins are insufficient
- margins are in line with the agent's documented description of how it accounts for assets and liabilities, including the methods and assumptions for valuation
- there is objective evidence and a track record to support margins being maintained. There is an added burden of proof on the agent to demonstrate that such margins exist

## **A CONSEQUENCE OF HOLDING RESERVE MARGINS IS THAT MORE CAPITAL IS HELD IN THE SYSTEM OVERALL**

## **AN ADDED BURDEN OF PROOF ON THE AGENT TO DEMONSTRATE THAT RESERVE MARGINS EXIST**

Agents should also consider the impact of continuing a prudent reserving policy if adverse loss experience erodes the margin (eg the need to rebuild margins to maintain reputation).

### Investment income/Discounting of reserves

Underwriting and reserve risk may be reduced to reflect investment income that will be earned on assets held against reserves and on premiums received in relation to the proposed and prior underwriting years. Lloyd's acknowledges that there are a variety of ways in which agents may allow for investment income within their ICAs. For any given method to be reasonable, it should adhere to the following guidelines:

#### Funds at Lloyds

Agents should allow for investment income only in relation to the assets actually held by the syndicate and exclude assets in FAL which may be called to meet future claims arising at the 1 in 200 confidence level. Lloyd's considers that as FAL is outside the scope of syndicate ICAs, no credit for future income on additional assets should be taken, as this takes credit for investment income on FAL. The inclusion of investment income on FAL within syndicate ICAs is considered inappropriate for a number of reasons:

- Investment income on FAL belongs to the providers of capital. It does not form part of syndicate assets, or central assets, and does not act to increase FAL. FAL may be provided by non interest bearing assets i.e. LOCs, and dividends/interest are distributed to members and not retained in FAL. As such, investment income on FAL cannot be used to reduce FAL requirements. It should therefore not play a part in the member level capital setting process.
- At the point where FAL is called and utilised, it effectively becomes an asset of the syndicate and consequently investment income earned on this amount then also becomes an asset of the syndicate. However, given the high level of uncertainty implicit in the timing of payments and cash calls and the difficulty in replicating and justifying the exact process for the calling of FAL within ICA models, Lloyd's considers it imprudent to allow for investment income earned in this way.
- Lloyd's considers that the method of setting capital at Lloyd's which is grounded on the syndicate ICAs plus economic uplift is a different basis to the company market. For companies, actual capital and surplus is compared to the computed ICA, whereas in Lloyd's, capital is determined by the ICA. Allowing for credit for capital in its own computation of adequacy can lead to circular calculations.
- Investment income and market risk on FAL is considered within the Lloyd's Society ICA model.

#### Rate of Investment Return

The rate of investment return used within syndicate ICAs can be based on actual forecast investment income for the syndicate and does not necessarily need to be based on the risk-free rate. However, Lloyd's considers that where a rate higher than the risk-free rate is assumed, agents should show a larger market risk component to appropriately reflect the higher risk of the investments required to achieve this rate. Even where the risk-free rate is assumed, Lloyd's would not expect a zero market risk component. Although using such a rate mitigates the risk of

**AGENTS SHOULD ALLOW  
FOR INVESTMENT INCOME  
ONLY ON ASSETS ACTUALLY  
HELD AND NOT ON FAL**

**THE RATE OF INVESTMENT  
RETURN USED CAN BE  
BASED ON FORECAST  
INVESTMENT INCOME**

**EVEN WHERE THE RISK FREE RATE IS USED LLOYD'S WOULD NOT EXPECT A ZERO MARKET RISK ALLOCATION**

default, market risk still remains in that the syndicate is exposed to the extent that liabilities are not perfectly matched.

A stochastic investment return can be used, although in practice it is acceptable to assume either or both of investment income and settlement pattern are deterministic. In principle however, a deterministic approach overstates the credit given and so a margin for parameter uncertainty should be taken in the assumptions.

#### Types of Model

A sophisticated model may project cash-flows and asset movements in relation to existing business and proposed year business through to the expected payment of all claims on that business and will recognise income (at an expected return) on assets held in relation to the business over that period. Such a method may implicitly allow for market risk.

A more simplistic model may only be able to approximate this approach. For example, it may not project calendar year cash-flows and therefore may not be able to allow for the precise timing of premiums received, claim payments made and investment income on syndicate assets. In this case, it is acceptable to apply a discounting approach to the ICA whereby an assumed discount rate (which may be the risk-free rate or higher) is applied to syndicate assets for the mean term of those assets. At the 1 in 200 event level, this is equivalent to discounting existing reserves and future claim amounts arising from the proposed and prior years, but only up to the value of the syndicate assets (so as not to include investment income on FAL). Lloyd's would expect agents to take a prudent approach if such a simplistic method is used and to pay particular consideration to the duration of liabilities and the consistency with market risk, as described in the sections below.

In practice, agents may apply a range of methods which are somewhere in between these two extremes. Whatever method is used, care should be taken to ensure that there is no double counting of investment return and that market risk is considered in conjunction with the chosen approach.

#### Duration

Where an agent uses a discounting approach, consideration should be given to the timing of payments. When assessing the duration of liabilities at the 1 in 200 event level, Lloyd's expects that the mean term of liabilities should be reduced from that at the best estimate level. At the 1 in 200 event level, syndicate assets will be depleted more quickly than at the best estimate level, purely due to the increased level of losses and potential delays in collection of reinsurance recoveries. In addition, there may be changes to expected payment patterns as a result of the 1 in 200 event. Agents should ensure that it is the mean term of the payments which are made from syndicate assets which is assessed, not the mean term of all payments made (as some payments at the 1 in 200 level will ultimately come from FAL).

#### Link with Market Risk

Whatever approach is taken with regard to allowing for investment income, it must be consistent with the approach used for market risk. In particular, market risk should reflect the risk of not achieving the rate of return assumed, whether this is the current risk-free rate or the syndicate's expected return. Agents should also consider carefully the

**CARE SHOULD BE TAKEN TO ENSURE THERE IS NO DOUBLE COUNT OF INVESTMENT RETURN**

period over which they are measuring market risk and ensure that it is consistent with the period over which they are discounting reserves or allowing for investment income. The ICA should take into account any increase in market risk that arises because of the investment income/discounting approach used and should make clear the relationship between market risk and investment income/discounting.

### Margins

Agents should consider the treatment of reserve margins when using a discounting approach and avoid any double counting. For example, discounting held reserves but also allowing for a margin between discounted (rather than undiscounted) best estimate reserves and held reserves would imply a double count. Agents should set out clearly their discounting calculations and explain any interaction with reserve margins claimed.

Agents should discuss any issues relating to allowance for investment income/discounting with their team leader in the first instance. Details of example calculations are available if required.

### Latent claims

Latent claims are by their nature unexpected and therefore are not necessarily reflected in actuarial projections, but the ICA should reflect the risk that they will emerge. Two approaches are:

- adjust the data in the actuarial projections, or the projections themselves 'as if' latent claims of assumed materiality had emerged
- load the assumptions directly – increase the correlations between years and the volatilities, or increase the stress tests and the dependency between them

Agents should apply at least one, preferably both methods and should examine the impact on the assumptions and results, making their assumptions clear.

### Regulatory changes

Agents should ensure that they consider within the ICA the risk of changes to regulation or legislation affecting their reserves. In the UK, the introduction of the "Ogden tables" is an example of such a change. The approach may be similar to that for latent claims.

### Unexpired risks on 2008 and prior years of account (YOA) and 2009 YOA risk

Reserving risk should not include any unearned exposure on the 2009 YOA which should be assessed within underwriting risk.

### Catastrophe losses

The ICA should include adequate reserve risk arising from catastrophes that have already occurred, such as WTC and the 2005 US hurricanes. Lloyd's will consider carefully the reserve risk for syndicates with unpaid catastrophe losses.

### Large individual risk losses

The ICA should take account of the reserve risk arising from large losses. This should include where appropriate:

**THE ICA SHOULD REFLECT THE RISK THAT LATENT CLAIMS WILL EMERGE**

**ICA SHOULD INCLUDE ADEQUATE RESERVE RISK ARISING FROM CATASTROPHES THAT HAVE ALREADY OCCURRED**

- historical large losses - these may deteriorate suddenly as disputes are started or resolved. This uncertainty at a gross level can be even greater at the net level
- late advices - large claims can be notified late or the large size of a claim may only suddenly and belatedly become apparent
- “reserved at limits” - claims may be described as reserved to limits when on a probable basis there is no further cover, but theoretically cover could still exist. The ICA should include the risk that deteriorations beyond what is probable can take place
- withdrawal from a class - this can generate or bring forward speculative claims

#### **Attritional loss experience**

As well as considering the impact of large and catastrophe losses on reserves, agents should also consider the impact of attritional losses and general reserve deterioration. The ICA should allow for unexpected adverse movements including new trends or the continuation of existing adverse trends. If the number of claims turns out to be higher than expected, the ICA should allow for any consequences such as sideways reinsurance exhaustion or lack of claims staff/external advisors (eg demand surge following 2005 US hurricanes)

#### **New syndicates and/or new classes of business**

Where a new syndicate is producing an ICA for the first time, agents should include at least two prior years of reserving risk. The level of such reserves should be hypothecated assuming the same classes of business and premium volumes as per the initial agreed SBF were written in the previous two years.

In assessing reserving risk for new classes of business, the parameters used should reflect the appropriate level of uncertainty and risk. Lloyd’s would expect agents to use prudent assumptions and also consider the additional volatility. Where little or no historical data exists agents should refer to benchmarking or market data.

#### **Application of reinsurance programme**

The ICA should allow for the risk of exhaustion and dispute, and should allow for the possibility that the relationship between the syndicate and its reinsurer will deteriorate especially if gross claims are high.

#### **Operating expenses**

Syndicate ICAs should address potential exposure to financial loss from higher than expected costs and expenses not directly related to claims.

#### **Use of syndicate data and benchmarking**

Own reserve run-off experience does matter but agents should consider other benchmarks as well. Benchmarks should include market-level reserve volatilities and agents can use data from market (or from failed firms if available).

## **NEW SYNDICATE ICAs SHOULD INCLUDE TWO PRIOR YEARS OF RESERVING RISK**

## THE ICA SHOULD ALLOW FOR DEPENDENCE BETWEEN UNDERWRITING YEARS

### Allowance for trends such as inflation

Agents should consider these trends, not only at best estimate level, but also where there is a deterioration of the trends.

### Dependence between underwriting years

Agents can consider all years together or look at individual years separately. In either case, the ICA should allow for dependence between years and a total figure for all years is required.

### Operational risks associated with reserving risk

Agents should include an explanation of how operational risks associated with the following have been addressed when assessing reserving risk.

#### Systematic under reserving/miscoding

Agents should include operational risk error eg systematic under assessment of reserves, miscoding and late notification of claims.

#### Timeliness of management information (eg reporting of binder income and losses incurred)

Agents should consider the reporting and procedures in place for monitoring reserve deterioration and any potential time delays in being aware of significant developments arising.

#### Modelling at a sufficiently granular level

Agents should ensure that modelling of risks is at a sufficiently granular level to capture homogenous classes of business.

## Reinsurance

Syndicate ICAs should consider the risks associated with the use of, and potential reliance on, reinsurance in respect of both underwriting and reserving risk. This should cover the areas set out below but should not include the risk of failure which falls into credit risk.

Lloyd's recognises however that where agents are running sophisticated models it may fall into insurance risk. Although in principle, reinsurance credit risk should be shown separately from insurance risk, Lloyd's recognises that this is difficult to do in some models. In practice, showing reinsurance credit risk within insurance risk has not caused any difficulties therefore Lloyd's does not necessarily require agents to split out the reinsurance credit risk in this way. However, Lloyd's may request as a sensitivity test for this, agents to calculate the insurance risk assuming no credit risk compared to the actual assumptions and justify the difference.

We are aware that this may make it difficult for a specific allocation pre diversification to reinsurance credit risk, but it will assist Lloyd's benchmarking and review process if agents make this as clear as possible.

Details of material current and prospective reinsurance protecting the syndicate should be provided in the ICA, or by cross reference to the SBF, Syndicate Reinsurance Programmes (SRP) or other submission to Lloyd's. The ICA should also state assumptions with respect to cost and availability of reinsurance and agents are requested to address the impact of any proposed material changes for 2009 within the ICA.

## ICAs SHOULD CONSIDER THE RISKS ASSOCIATED WITH THE USE OF REINSURANCE

## DETAILS OF MATERIAL CURRENT AND PROSPECTIVE REINSURANCE SHOULD BE PROVIDED

The ICA should reflect the potential adverse impact on underwriting (eg prudential gross pricing and risk selection) of the availability of reinsurance or of the advanced costs incurred in purchasing reinsurance, in particular, when the underwriting of a given class is materially dependent on reinsurance.

### **Non-matching reinsurance**

Agents should consider the risks arising as a result of:

- long term, non-cancellable inwards policies written by the syndicate where there is a material reliance on reinsurance of shorter duration, and where there is no certainty over renewal pricing of such reinsurance (particularly in a post loss scenario), or where known renewal terms and conditions would impose an additional cost
- reinsurance covering Losses Occurring During (LOD), rather than Risk Attaching During (RAD), the period of cover and where there is no certainty over renewal pricing of such reinsurance (particularly in a post loss scenario), or where known renewal terms and conditions would impose an additional cost
- gaps in coverage as a result of a change in the basis of cover, eg moving from LOD to RAD cover
- the use of fixed currency rates of exchange for programme deductibles/limits
- a lack of an appropriate or the expected level of risk transfer under financial engineering products, including finite reinsurance. The ICA should explain the extent to which financial engineering has been used, for what purpose, and the impact on both assets and liabilities
- failure to complete the placement of reinsurance prior to the occurrence of a material loss
- the operation of reinsurance exclusions, or a poorly worded reinsurance contract, whereby the syndicate would retain an unexpectedly larger proportion of a significant loss
- potential for different legal jurisdiction to apply on inwards business compared to outwards reinsurance

### **Exhaustion**

Syndicate ICAs should consider exhaustion of reinsurance cover and risks arising as a result of:

- the occurrence of multiple losses at a level requiring material reinsurance support, ie the purchase of insufficient horizontal coverage
- the occurrence of an unexpected large event that may exhaust vertical cover
- the erosion of cover as a result of losses from other classes where reinsurance protects more than one class of business (assuming appropriate treatment of inuring programmes)
- the risk associated with projecting the appropriate amount of reinsurance cover to purchase, eg in long tail lines of business, requiring a longer term assessment of the potential for the erosion of cover over time

## **ICAs SHOULD INCLUDE RISK ARISING FROM EXHAUSTION OF REINSURANCE COVER**

## **ICAs SHOULD CONSIDER THE POST LOSS IMPACT ON REINSURANCE**

### **Post loss impact on cost and availability**

Syndicate ICAs should consider the post loss impact on reinsurance and risks arising as a result of:

- the effect of contractual conditions, eg additional premiums, 'payback' and coverage restrictions
- potential unavailability or uneconomic pricing of reinsurance
- material changes to reinsurance programme structure, eg increased programme deductibles, restricted vertical or horizontal cover, changes to terms and conditions, or to the basis of coverage
- withdrawal from a class due to non-availability of reinsurance, leading to run off costs and loss of underwriting expertise to manage the run off

### **Concentration of reinsurers**

Agents should address any concentration of particular reinsurers within their portfolio. This will affect other risks, particularly credit risk and dispute risk.

### **Dispute**

A reinsurer's unwillingness to pay may lead to a dispute over losses presented under a reinsurance contract. Agents should articulate what steps are taken to mitigate reinsurance dispute risk. The impact of delays in payment and pressures on management time should be considered. The tail of the account should also be considered as the class of business may lead naturally to more disputes, ex gratia settlements and turnover of reinsurers year on year.

### **Structured and/or multi year reinsurance policies**

Agents should consider the economic value of structured and/or multiple year reinsurance contracts particularly any with an aggregate limit for the policy period that is less than the sum of the annual limits. Any calculation of credit for a multi-year reinsurance should apply the contract's lifetime expected premium against the annual limit available.

Lloyd's will review credit taken for any recoveries under stop loss policies on an individual basis.

### **Industry loss warranties (ILW)/Original loss warranties (OLW) basis risk**

The ICA should specifically address any material basis risk, for example in respect of ILW or OLW forms of cover in which a recovery is triggered in the event of a specified amount of industry loss. This may expose the syndicate to material losses which would normally be reinsured if the total industry loss does not reach the specified amount. Full details of the methodology used to calculate or mitigate the basis risk should be provided in the ICA submission.

### **Example Stress Tests**

The suggested stress tests below may be used when assessing insurance risk. This list is not exhaustive and is not a substitute for stress tests relevant to each individual business.

## **AGENTS SHOULD EXPLAIN STEPS TAKEN TO MITIGATE REINSURANCE DISPUTE RISK**



The schedule is not prescriptive, however where Lloyd's is unable to get comfortable with the stress tests used by an agent, these are example stress tests that Lloyd's may require the agent to perform to support the conclusions in the ICA.

- **risk of 40% under-pricing in key business lines combined with 40% growth in business lines affected**

- **main class of business performs 50% worse than planned**

- **two largest RDSs combined**

**withdrawal from largest class of business with more than 100% increase in run off reinsurance costs**

- **systemic poor risk selection because structure has not grown with business**

- **multiple loss of disputes with lead reinsurer leading to 40% shortfall in reinsurance recoveries**

- **40% deterioration on reserves**

- **largest two year-on-year reserve deteriorations in syndicate's history**

Agents should be aware that Lloyd's will require explicit sensitivity testing on ULRs and reserve deterioration as part of the pro-forma. Full details of these are given in the notes to that document (Appendix 3).

## CREDIT RISK

This section sets out and explains the technical issues regarding the assessment of credit risk.

### Reinsurance Credit Risk

When considering credit risk, agents should differentiate between underwriting and reserving elements. Reserve credit risk is on a known asset whereas underwriting credit risk is an uncertain loss on an uncertain asset with uncertain security and there may be a greater dependence between gross losses and credit risk for underwriting risk than for reserving risk. There may well be a dependence between extreme gross reserve development and the associated reinsurance credit risk.

In a good practice approach, the main components of a syndicate's proposed, current and prior years of account reinsurance programme should be identified and modelled explicitly.

In addition to their own data, agents should use credit ratings and reinsurer specific risks; eg small and specialist will be riskier than large and diversified even if rated the same. Agents should also test data against their own worst experiences.

#### Gross and net losses

When a model is used, gross losses as well as net should always be considered and mapped through the relevant reinsurance programmes. Where syndicate reinsurance programmes are complex, Lloyd's recognises that this calculation will be difficult to perform explicitly. In such cases, the agent should make allowance for the operational risk inherent in the complexity of the programme. Where reinsurance programmes change materially year on year, this should also be considered, particularly how they may apply to legacy business with run off exposures.

#### Link increased probability of reinsurance failure to extreme losses

The ICA should also take into consideration the increased risk of reinsurance failure in extreme loss scenarios. Lloyd's considers that correlations increase in many of the extreme loss scenarios. In modelling terms, this would involve correlating reinsurance failure rates with large loss scenarios.

#### Concentration risk

In determining the capital requirement for reinsurance credit, the ICA should reflect both the concentration risk and financial strength of the reinsurer. Where a syndicate has a significant concentration to individual reinsurers (including intra group) the ICA should consider this.

#### Reinsurance failure rates should allow for the risk of downgrade

Agents should allow for downgrading of reinsurers when assessing credit risk and not refer only to standard default rates or current ratings. A weakness in using standard default rates is that a market average rate is not always applicable to an individual syndicate's reinsurers or to the scenarios for which reinsurance is being relied upon. Reinsurance assets

**AGENTS SHOULD DIFFERENTIATE BETWEEN UNDERWRITING AND RESERVING ELEMENTS**

**INCREASED RISK OF REINSURANCE FAILURE IN EXTREME LOSS SCENARIOS**

**ICA SHOULD REFLECT THE CONCENTRATION RISK AND FINANCIAL STRENGTH OF THE REINSURER**

are very likely to be much larger in the stress scenario than in non-stress conditions.

In addition, the factors are derived from historical corporate bond default rates, which do not have any direct relationship to future reinsurer default rates.

Therefore these tables should be used as a benchmark only. Lloyd's considers it good practice for syndicates to consider reinsurance default with specific reference to the actual reinsurers not just reinsurers banded by S&P ratings, whether stressed to a one or multiple "notch" downgrade.

## **THERE IS A HIGHER PROBABILITY OF DEFAULT ON A MORE DISTANT RECOVERY**

### **Duration of recoveries**

Agents should explicitly consider the duration of liabilities when considering reinsurance credit risk as there is a higher probability of default on a more distant recovery.

### **Treatment of reinsurance placed with other Lloyd's syndicates**

Lloyd's does not wish to indirectly influence the placement of reinsurance as a result of the ICA process. Therefore, agents should treat policies placed at Lloyd's on a similar basis to another reinsurer with a comparable financial strength.

### **Treatment of any intra group reinsurance**

Agents that belong to wider insurance groups should not treat reinsurance placed with the parent group more favourably than reinsurance placed with an unrelated insurer with similar financial strength.

## **Other credit risk**

Issues to be considered when assessing non reinsurance credit risk areas are covered below:

### **Brokers**

Agents should consider the failure of their largest broker - this may be considered remote but the ICA must be assessed in the context of a 1:200 event. Additional areas to be considered under brokers would include premiums receivable from broker, claims paid to broker but not yet to insured and commissions not recovered when policies are cancelled and premiums returned or never received.

### **Coverholders**

Agents should consider the following issues:

- where premiums not received but policies bound
- claims paid but not passed on
- commission paid but policies cancelled and premiums returnable

### **Third Party claims administrators**

Agents should consider the risk of claims paid to a third party administrator but not passed on to policyholders. Where third party claims administrators hold claims floats, agents should consider the possible effects of misappropriation of funds or failure of the third party administrator.

## **AGENTS SHOULD CONSIDER THE FAILURE OF THEIR LARGEST BROKER**

**Banks and Investment counterparties**

Agents should consider the risk where significant balances are held with banks and/or investment counterparties.

**Example Stress Tests**

The suggested stress tests below may be used when assessing credit risk. This list is not exhaustive and is not a substitute for stress tests relevant to each individual business.

The schedule is not prescriptive, however where Lloyd's is unable to get comfortable with the stress tests used by an agent, these are example stress tests that Lloyd's may require the agent to perform to support the conclusions in the ICA.

- **failure of the largest broker**
- **failure of the syndicate's largest reinsurer (taking account of both reserve and underwriting credit risk)**
- **one (or multiple) notch downgrade of all reinsurers based on a reinsurance asset as the largest proportion of gross reserves that it has been for agent since 2000; or twice current if higher**
- **default by syndicate's most significant corporate investment counterparty**



## OPERATIONAL RISK

This section sets out and explains the technical issues regarding the assessment of operational risk.

When assessing operational risk, agents should ensure that all potential sources of operational risk are considered. The table below has been designed to assist agents to identify operational risks in their business by providing a (non exhaustive) breakdown of potential causes and data sources for each of the four types of operational risk, ie:

- people
- processes
- systems
- external events

Cause	Potential Causes	Potential Data Sources
<b>People</b>	<ul style="list-style-type: none"> <li>○ Manual input error</li> <li>○ Error in use of model/ system</li> <li>○ Lack of management supervision</li> <li>○ Inadequate staff training</li> <li>○ Inadequate staffing levels</li> <li>○ Process/ procedure not followed</li> <li>○ Lack of escalation to management</li> <li>○ Internal theft or fraud</li> <li>○ Recruitment screening failure</li> <li>○ Miscommunication - internal</li> <li>○ Miscommunication - external</li> <li>○ Other unauthorised activity</li> <li>○ Other unintentional error</li> </ul>	<ul style="list-style-type: none"> <li>○ Staff turnover/sickness rates, number of contract staff</li> <li>○ Dependency on key staff/ underwriters</li> <li>○ Loss experience on insurance contracts</li> <li>○ Extremes of over/ underperformance/ known conflicts of interest</li> <li>○ Typical notice periods and contract terms</li> <li>○ Strength of succession planning</li> <li>○ Level of complaints</li> </ul>
<b>Processes</b>	<ul style="list-style-type: none"> <li>○ Inadequate segregation of duties</li> <li>○ Inaccurate/ incomplete management information</li> <li>○ Lack of adequate processing control</li> <li>○ Inadequate functionality - supporting software</li> <li>○ Inadequate/ inappropriate policies</li> <li>○ Inaccurate/ Incomplete standing data</li> <li>○ Failure in corporate governance</li> <li>○ Other process failure</li> <li>○ Other control failure</li> </ul>	<ul style="list-style-type: none"> <li>○ Rapid expansion of business lines/ high moral hazard business areas</li> <li>○ Number and extent of binders written</li> <li>○ Nature and extent of manually intensive processes</li> <li>○ Exception reporting (eg business outside plan) and key indicators</li> <li>○ Management monitoring reports (eg policy or claims backlogs)</li> <li>○ Level of complaints/ reinsurance disputes/ adverse press comment</li> <li>○ Outstanding external and internal audit/ compliance/ regulatory report points/ frequency of regulatory intervention</li> </ul>

Cause	Potential Causes	Potential Data Sources
<b>Systems</b>	<ul style="list-style-type: none"> <li>○ Hardware failure</li> <li>○ Software failure</li> <li>○ Network/ telecommunications failure</li> <li>○ Third party provider failure - IT</li> <li>○ Inadequate virus protection</li> <li>○ Inadequate system security/ information risk management</li> <li>○ Insufficient processing capacity</li> <li>○ Insufficient/ untested business continuity processes</li> <li>○ Inadequate change/ release management</li> <li>○ Other system error</li> </ul>	<ul style="list-style-type: none"> <li>○ Number and complexity of MIS reports and papers</li> <li>○ Outstanding internal/ external audit points on MIS</li> <li>○ Number and complexity of IT systems/ planned IT upgrades</li> <li>○ Records of system outage/ security breaches/ virus attacks</li> <li>○ DRP implementation costs/ replacement costs of IT hardware/ realistic business interruption costs</li> </ul>
<b>External events</b>	<ul style="list-style-type: none"> <li>○ Natural disaster</li> <li>○ Man made disaster</li> <li>○ Third party provider failure - other</li> <li>○ External theft or fraud</li> <li>○ External breach of system security</li> <li>○ Power outage</li> <li>○ Other external event</li> </ul>	<ul style="list-style-type: none"> <li>○ Number and complexity of 3rd party users</li> <li>○ Terms and conditions of service level agreements</li> </ul>

## AGENTS SHOULD CONSIDER OPERATIONAL RISK LINKED WITH OTHER RISK CATEGORIES

Irrespective of the approach adopted to modelling operational risk, all material risks should be considered in the ICA. Agents should clearly articulate where within the ICA submission the material risks to the business have been considered.

Agents should consider operational risk linked with other risk categories as well as risks such as business continuity, loss of premises and loss of staff. Lloyd's appreciates the boundaries between operational risk and the other risk categories are imprecise, as operational risk can arise from a range of operational controls spanning all risk categories. The sections below show some examples of key operational controls under each of the other five risk categories. Consideration should be given to the risk that (as an extreme event) these controls are not fully effective.

### Insurance risk

- periodic actuarial input, for example ULRs, to assess the appropriateness of possible business plan outcomes
- documented business plan which sets out the parameters, classes, limitations and profitability expectations of the underwriting teams for the forthcoming year
- comprehensive procedures in place to conduct formal due diligence on significant new policyholders and classes of business on both a qualitative and quantitative basis
- regular exceptions reporting identifying all items that exceed pre-determined limits. Escalation procedure in place for significant exceptions
- pre-transaction testing by IT system to ensure that quotations, actual written lines or amendments to existing risks are within underwriting

authority limits for each underwriter. IT system blocks or refers attempts to create or amend risks which are outside of authorities

- regular formal process of experienced independent review, to challenge the assumptions and performance of current and past underwriting. Formal escalation process in place for immediate concerns to be addressed
- comprehensive and documented recruitment procedure. Documented training and development programme
- regular, formal meetings to review underwriting performance against plan expectations and potential profitability in the immediate future. Formal escalation procedures in place for any immediate concerns to be addressed
- formal written and signed underwriting authorities tailored to the specific skills of the individual and linked to the business plan, amended for any business plan changes and updated at least annually
- formal procedures to ensure contract certainty before inception and for the checking and assessment of policies/slip wordings
- regular, timely, formal process of peer review to provide forum for discussion of risks written (which may include terms and conditions and/or wording) with clearly documented action points and follow up
- formal procedures to set out the approach to underwriting and underwriting controls, such as procedures to refer items written 100% for review, prior to acceptance, for due diligence/ pricing analysis
- procedures to achieve proactive claims management including consistent, timely and accurate reserving, identification of KPIs and performance measurement, selection and management of third party experts and delegated authorities, and complaints handling
- procedures for the regular review of dormant or non moving claims.
- documented business plan which clearly sets out the reinsurance purchase requirements by class, type, security
- regular formal process for independent expert and management review which is appropriately timetabled around key dates for reinsurance purchase, security concentration and utilisation
- Board approved and monitored requirements for maximum net losses to major events
- regular formal reporting of reinsurance utilisation to the Board or properly designated committee
- formal modelling capability to assist in determining what levels and price reinsurance should be bought at to maximise return whilst restraining risk within manageable levels. Timely analysis of different options and sensitivity to class and syndicate aggregate exposures

#### Credit risk

- an established credit risk committee, with clear terms of reference, which reviews and updates the credit ratings of reinsurers, brokers and coverholders on a regular basis
- formal procedures for reinsurance purchasing, identifying the individuals responsible



- formal policy and procedures for the evaluation, usage and monitoring of new and existing reinsurance security
- formal policy and procedures for the evaluation, usage and monitoring of new and existing brokers
- review of concentrations within individual custodians, group companies, or geographic locations
- investment policy with clear limits and guidelines appropriate to the business
- regular aged debt reporting
- internal audit reviews of controls over third party credit risk
- a plan for managing cashflows/ liquidity following a major catastrophe

#### Market risk

- investment policy with clear limits and guidelines appropriate to the business
- annual review of benchmarks and revision in light of changes to business strategy
- formal investment management/ custodian mandates and agreements, including details of reporting to be provided and performance benchmarks
- regular reporting on investment portfolio, including value of the portfolio by investment asset class, sales and purchases made in the period and cash movements
- monitoring of the portfolio against the limits established in the investment mandate
- regular reconciliations of investment holdings
- regular monitoring of the credit worthiness of counterparties and issues
- periodic reviews of controls operated by counterparties

#### Liquidity risk

- credit control policy and procedures to target outstanding premiums and reinsurance recoveries for collection
- stress testing modelling to review liquid assets against unexpected events
- regular formal cashflow forecasting, showing the cash position by month and currency and reflecting the likely effect of a RDS/ catastrophe events
- monitoring actual levels of liquid assets against a benchmark
- the maintenance of sufficient (liquid) assets to meet expected/ reasonable changes in regulators' financial requirements, or contingency plans to raise sufficient funds
- formal agreements in place for borrowing facilities/ funding arrangements
- credit control policies and procedures to target outstanding premiums and reinsurance recoveries for collection
- personnel with sufficient skills and knowledge of the cash call process

#### Group risk

- formal group reinsurance agreements

## **DEMONSTRATE THAT THE RISK MANAGEMENT FRAMEWORK IS EMBEDDED WITHIN THE ORGANISATION**

- documented terms of reference where group functions are shared
- formal agreements in place for intra group borrowing facilities/ funding arrangements.

### **Mapping to the risk register**

Agents should undertake an operational risk assessment that is mapped clearly to the risk register of the syndicate and supported by a robust risk management framework. The ICA should include a clear explanation of which risks in the risk register have been considered in the assessment of operational risk.

Senior management should be able to demonstrate that the risk management framework is embedded within the organisation and provides a representative feed into the ICA submission. When preparing the ICA, agents should consider whether any material risks have arisen since the last formal risk assessment that should be taken into account in the ICA.

Key features of a robust and dynamic risk management framework are as follows:

- regular self-assessment of potential exposure to operational risk, considering all significant operational risks stemming from the syndicate's objectives, processes, systems and activities, as well as the nature of its customers, products and the external business environment
- assignment of 'owners' for each of the significant operational risks identified. Risk owners must have some control over their risks and have the influence to be able to effectively manage them
- regular review of operational risks in the risk register, showing challenge by appropriate personnel to those risks identified
- regular review and update of the impact and probability scores for each of the operational risks in the risk register
- regular assessment of controls or control failures that require remedy, not restricted to controls currently operating within the business, rather those controls that may be needed to further mitigate risks to the required risk appetite levels
- development and implementation of action plans for unacceptable levels of risk and/or the remediation of control weaknesses
- monitoring Key Risk Indicators (KRIs) to assist in identifying potential operational risk hotspots that could result in operational risk losses. KRIs are intended to:
  - identify the syndicate's key operational risk exposures
  - enable the agent to monitor and manage proactively the underlying causes of the syndicate's key operational risk exposures
  - use thresholds aligned to the agent's appetite for operational risk and enable risk based decision making
  - be commensurate with the nature of the operational risk exposure
  - complement other sources of operational risk self-assessment and loss data.

## THE ICA SHOULD EXPLAIN CLEARLY THE APPROACH TO THE QUANTIFICATION OF OPERATIONAL RISK

### Categorisation

Operational risk may be treated as a stand alone risk category or may include elements of operational risk as part of other risk categories (or any combination of these). The ICA should explain clearly the approach adopted.

### Quantification

The ICA should explain clearly the agent's approach to the quantification of operational risk.

An arbitrary loading will not be considered an appropriate methodology when assessing operational risk, no matter how prudent the level of capital allocated. Due to the level of judgement involved, this is a challenging area within the ICA submission and can be tackled in one of two ways:

#### Modelling approach

The following approaches are commonly used when modelling operational risk:

- Monte Carlo simulations of elements of operational risk modelled within underwriting, reserving and investment risk
- cumulative probability distribution modelling by means of stochastically modelling the operational risks in the risk register to build up a cumulative frequency distribution and required capital at a 99.5% confidence level
- normal distribution modelling, eg mean £1m, standard deviation £1.25m, and drawing conclusions based on this
- as part of an overall economic capital model.

Where a modelling approach is undertaken this must be supported by appropriate stress and scenario tests to validate modelled output. In addition the model should be sense checked by altering one or more of the parameters and observing the effect of this on the modelled results.

#### Stress and Scenario test approach

Where a stress and scenario approach is taken, agents should consider the following:

- management should apply judgement in selecting stress and scenario tests that are pertinent to the business, with each scenario being a sufficiently extreme event linked to risks within the risk register
- a clear distinction should be made between risks in the risk register that are used to assist management in the day to day running of the business and those extreme event scenarios used to quantify the capital requirement. Lloyd's appreciates that not all material day-to-day risks have material capital requirements and that capital is not an appropriate mitigant for each and every risk. A range of scenarios should be considered which on a combined basis ensure that all key operational risks have been considered somewhere within the capital assessment for the agent. The way in which the chosen scenarios capture the risks within the risk register should be discussed amongst appropriate personnel who understand the nature of the risks that they have responsibility for
- scenarios should be broad enough to encompass any ripple effects such as effect on reputation

## EACH SCENARIO MUST BE A SUFFICIENTLY EXTREME EVENT LINKED TO RISKS WITHIN THE RISK REGISTER

- the selected scenarios should be combined to derive an overall capital charge for operational risk. A common aggregation method is to use a correlation matrix. This method has the advantage of being simple and transparent, however judgement is required in the selection of correlations. This approach also requires all stresses to be assessed at one common confidence level (ie 1:200) which is difficult in practice. An alternative approach, which does not require each individual stress to be at the 1:200 level, is to consider a range of extreme scenarios and then apply an impact to each. Once assessed for impact, the likely frequency can be derived. Combinations of scenarios can then be considered and the combination with the worst combined impact and a return period of at least 1 in 200 is selected as the capital requirement.

#### Loss data

Whether using a modelling or a stress and scenario based approach, agents should bear in mind that past experience is not always an accurate indicator of future losses. Therefore, management may wish to consider a number of data sources in order to take into account the full spectrum of loss potential.

#### External loss databases:

- external loss data can provide an indication of the size, frequency and sources of losses experienced by others and is therefore a useful reference when assessing potential risk exposures. The principal value of such data would be to prompt discussion of the most extreme potential future scenarios that historic data may be unable to show. From a day to day management perspective these scenarios may not be relevant, however when considering extreme events these may warrant inclusion for ICA purposes
- loss databases can also provide additional data which may potentially assist with the modelling of operational risk capital requirements. However, careful judgement is needed on the relevance of such data, in view of different industry or industrial sector data sources, differences in operational scale, control systems, cultures and the likely completeness of the data

#### Internal loss databases:

- this involves systematic tracking of actual, potential and 'near miss' operational risk losses
- losses could be as a result of a new risk giving rise to a loss or due to the failure or lack of a control in relation to a previously identified risk
- Lloyd's would encourage agents to track their internal loss data in order that management is able to measure risk exposure more accurately, identify trends and lessons to be learned over time and therefore use this loss data as an input for capital calculation

Whichever approach is adopted to the quantification of operational risk, it should be clearly explained in the ICA submission. Where operational risk is included in other risk categories, in particular insurance risk, it is difficult to quantify separately the amount of capital allocated to operational risk. In these cases agents should ensure that they explain which elements of operational risk they believe to be incorporated in the model, for example by mapping to the risk register.

## PAST EXPERIENCE IS NOT ALWAYS AN ACCURATE INDICATOR OF FUTURE LOSSES

## **AGENTS SHOULD CONSIDER THAT CONTROLS MAY NOT OPERATE AS INTENDED IN A STRESSED SCENARIO**

### **Reliance on systems and controls**

Management should assess any potential change to the syndicate's business and operational controls following an extreme event, for example taking into account that controls may not operate as intended in a stressed scenario. A capital allocation in respect of a failure of controls under a stressed scenario does not necessarily indicate a poor control environment, rather this is merely appreciating the magnitude of the extreme scenario.

Agents should consider whether capital is needed in respect of current known weaknesses in controls, for example where identified by internal or external audit or an FSA ARROW visit.

An agent may consider that investigating operational weaknesses and corrective action is a more appropriate response than holding capital or that a certain degree of operational risk is within its pre-defined risk appetite. However, until the agent corrects any identified deficiencies, it should consider capital as an interim response to the risk.

### **Consideration of the following specific areas where appropriate to the syndicate's business:**

#### **Delegated Underwriting**

Agents should consider all aspects of the risks associated with delegated underwriting including:

- data quality issues (eg pricing, claims notification and settlement)
- the impact of controls on the residual scoring of the risk
- due diligence processes
- selection criteria

#### **New syndicates and/or new classes of business**

Agents writing new books of business should ensure that in addition to any credit taken for diversification, they consider the full spectrum of risks relevant to the new book. This may include:

- additional volatility as compared to the existing classes written by the syndicate
- increased uncertainty over the nature of the risks faced by the new book
- a new underwriting team and cultural implications of this to the existing organisation
- revised processes that must be integrated into the syndicate's existing processes, including monitoring and selection of binding authorities, availability of appropriate expertise over the new book and any run off business integration

For new syndicates agents should ensure that the ICA reflects the additional operational risks faced by the business as new teams are introduced and systems and processes are developed and implemented.

## **AGENTS MUST CONSIDER THE OPERATIONAL RISKS ARISING FROM GROWTH AND NEW BUSINESS**

### Growth

Where a syndicate has grown significantly or there are plans for future growth, agents should ensure that they have considered the risks associated with this growth. This may include:

- whether the control framework is sufficiently formal
- adequacy of the existing systems and infrastructure for increased business volumes
- available expertise

### Stress and scenario tests

This section sets out a number of example stress and scenario tests for operational risk. This is designed to assist agents in developing scenarios at a sufficiently extreme and detailed level. These examples are illustrative and agents should ensure that they use scenarios which are specific to their business.

The schedule is not prescriptive, however where Lloyd's is unable to get comfortable with the stress tests used by an agent, these are example stress tests that Lloyd's may require the agent to perform to support the conclusions in the ICA.

Preparatory work should involve linking extreme scenarios to the risk register. A practical way to then further develop scenarios is to organise workshops involving senior managers and experts from relevant departments to comment on the scenarios chosen. Stress and scenario testing should also be used to validate stochastic modelling, where applicable.

#### Scenario 1 - Bomb in the City of London

Bomb explosion in the City of London, causing major damage to both the agent's office and the Lloyd's building. Access to the Lloyd's building denied for a prolonged period, affecting operations. Loss of life of senior executive(s) and key underwriter(s). BCP/ DRP invoked. The syndicate is not running at full capability.

#### Scenario 2 – Loss of underwriting team

Loss of the largest underwriting team to a competitor. Profitable niche market and therefore high recruitment costs and long lead time resulting in significant loss of profits. Poor maintenance of documentation resulting in an inability of the syndicate to fully service the claims of policyholders.

#### Scenario 3 – Rogue underwriting

An underwriter deliberately underwrites outside of his underwriting authority/poor quality binder and outside of the syndicate business plan approved by FPD. The business is loss making and outside of the syndicate's reinsurance programme. Controls in place do not capture the error for some months resulting in more policies being underwritten and significant losses to the syndicate.

#### Scenario 4 – Contract certainty/dispute

Due to a wording dispute a major claim is conceded. A number of policies underwritten using the same wording thereby exposing the syndicate to further unexpected claims. Staff levels at agent not sufficient to process the level of claims being received resulting in an over-worked

**AGENTS MUST USE  
SCENARIOS WHICH ARE  
SPECIFIC TO THEIR  
BUSINESS**

workforce. Senior claims manager leaves to go to a competitor and a replacement cannot be found for 12 months.

**Scenario 5 – Underwriting controls failure**

Underwriting authority limits are not enforced. Peer review, exception reporting and independent review are not effective and do not detect a significant increase in exposures. The business written is loss making and not covered by the reinsurance programme, resulting in significant losses to the syndicate.

## MARKET RISK

This section sets out the technical issues regarding the assessment of market risk.

Lloyd's considers that assets cannot be held on a basis perfectly matched to the underlying liabilities of a syndicate in both term and currency since the timing and extent of liabilities are uncertain. Consequently, Lloyd's would expect an allocation of capital to market risk in all ICAs. In particular, under extreme conditions, claims inflation is likely to exceed income from underlying investments.

The correlations between market risk and insurance risk should be considered in the ICA as in an extreme loss it is likely that there will be an impact on asset values. The correlation between market risk and liquidity risk should also be considered particularly where assets may be realised at unusually high costs or where the timing is such that unusually low valuations are realised.

The sensitivity of the ICA to changes in the underlying asset mix should be considered. This should include not only the current asset mix but also deviations from this so far as possible within the syndicate's investment policy.

### **Exposures arising from variations in exchange rates, interest rates and investment returns**

Agents should ensure that sufficiently extreme movements in returns and exchange rates are used to assess market risk at the 99.5% confidence level. Agents should consider the position on the yield curve as well as the impact of both upwards and downwards movements in interest rates.

### **The volatility of asset prices and the correlation of investment types**

Historical volatility should be considered when making assumptions about future volatility and, therefore, the riskiness of a syndicate's investment portfolio. The correlation of the various investment types within the portfolio should be assessed in order to reflect realistic conditions.

Where agents invest in corporate debt, they should also consider the impact of changes in credit spread and potential default.

### **The correlation between investment and insurance risk following extreme loss events**

Agents should assess the impact that a particular insurance disaster will have on investment portfolio returns if it has a detrimental effect on the financial markets.

### **Where the expected investment return is higher than the risk free rate**

Where the expected investment return/discount rate used is higher than the risk free rate, Lloyd's would expect this to result in an increased market risk as riskier investments are needed to produce the higher return. This risk should be addressed and agents should also consider the risk of assets not earning the assumed rate leaving a capital shortfall.

**IT IS LIKELY THAT THERE WILL BE AN IMPACT ON ASSET VALUES IN AN EXTREME LOSS EVENT**

**THE ICA SHOULD CONSIDER THE RISK OF ASSETS NOT EARNING THE ASSUMED RATE**



### **Investment income/discounting of reserves**

Where credit has been taken for investment income/discounting of reserves, agents should consider the timing and duration of payments and potential for rate changes over this period. Agents should address the potential that assets do not earn the assumed rate of return, leaving a capital shortfall, and should ensure consistency between the treatment of investment income and market risk (see also the investment income/discounting of reserves section within the detailed insurance risk guidance note)

### **Example Stress Tests**

The suggested stress tests below may be used when assessing market risk. This list is not exhaustive and is not a substitute for stress tests relevant to each individual business.

The schedule is not prescriptive, however where Lloyd's is unable to get comfortable with the stress tests used by an agent, these are example stress tests that Lloyd's may require the agent to perform to support the conclusions in the ICA.

- **50% fall in equity prices**
- **interest rate rise of 300 basis points on bonds**
- **US dollar exchange rates or major settlement currency move adversely by 40% with extreme losses reported**

## GROUP RISK

This section sets out the areas which should be considered by agents who are part of a group when assessing their group risk capital requirement. Where applicable, agents should consider the risks associated with managing multiple syndicates, as well as those arising from being part of a wider group with a common parent company.

### Capital

Agents should consider events occurring elsewhere within the group that may have an impact on the capital requirement including:

- a change in group strategy
- parent company exerting undue influence on the strategy of the syndicate
- withdrawal of a major capital provider resulting in a fall in syndicate capacity
- regulatory action against another group member
- financial pressure upon syndicate/ agent from elsewhere in the group, which adversely impacts the syndicate
- the likelihood and financial consequences of both insolvency and credit downgrading of the parent company
- the effect of a downgrade on the business plan (loss volumes and increased marketing costs) and on profit margins
- losses in another group entity, followed by a downgrade of that company's security rating to a level below secure by the major rating agencies

### Group reinsurance arrangements

Where a syndicate is a party to a group reinsurance arrangement, whether through a shared programme with another group entity or intra group reinsurance, agents should consider the risk associated with the arrangements.

In particular, senior management should be able to demonstrate that the arrangements in place will be sufficient in an extreme event. The risk of failure to realise reinsurance recoveries from group reinsurances may also be considered within the credit or insurance risk sections.

### Shared platform

Where an agent shares services with other group entities, they should consider the risks associated with these arrangements including:

- the availability of support services provided by the group company (eg Investment management, IT, actuarial etc.)
- shared management structures/ staffing with resources being diverted away from the syndicate in a 1:200 year event

### Management resources

Where an agent shares management resources with other group entities, the potential "stretch" of these resources should be considered. In particular agents should consider the increased impact of extreme loss events on shared management resources.

**EVENTS OCCURRING ELSEWHERE WITHIN THE GROUP MAY HAVE AN IMPACT ON CAPITAL**

**THE ICA SHOULD CONSIDER THE RISK ASSOCIATED WITH GROUP REINSURANCE ARRANGEMENTS**

## Example Stress Tests

The suggested stress tests below may be used when assessing group risk. This list is not exhaustive and is not a substitute for stress tests relevant to each individual business.

The schedule is not prescriptive, however where Lloyd's is unable to get comfortable with the stress tests used by an agent, these are example stress tests that Lloyd's may require the agent to perform to support the conclusions in the ICA.

### Capital

- **brokers decide to remove 40% of the syndicate's business and place it with competitors**
- **additional costs are incurred by the syndicate in legal fees and damage limitation, marketing and PR related costs**

### Reinsurance

- **failure to realise reinsurance recoveries from group reinsurance agreements due to exhaustion of the joint reinsurance programme resulting from large claims made by the other group companies**

### Shared platform

- **shared resources being diverted away from the syndicate due to parent company pressure**

## LIQUIDITY RISK

This section sets out the technical issues regarding the assessment of liquidity risk.

When assessing liquidity risk, agents should take account of the minimum level of free funds (ie funds not tied up in overseas regulatory deposits) required, taking account of the time horizon used.

In assessing any capital requirement for liquidity risk, agents should consider this in conjunction with both insurance risk and market risk particularly in relation to the impact that various stress and scenario tests may have on the cash positions of a syndicate and its ability to pay claims.

If an agent makes no allowance for liquidity risk within a syndicate's ICA, it should state clearly the reasons for arriving at this conclusion within the ICA submission and demonstrate a clear understanding of the timing of key cashflows under stress.

### Planning and cashflow

Agents should consider liquidity risk arising from failures to forecast cashflow requirements accurately. Process weaknesses may also impact on cashflow, for example poor credit control and management of disputes could cause liquidity strains.

### The impact of distribution of profits

As required, the ICA must be prepared on the basis that all profits have been distributed. Where an agent considers that this poses a liquidity strain, this should be allowed for within liquidity risk.

### Unexpected events

Liquidity strains resulting from unexpected events such as changes in overseas regulatory funding requirements should also be considered.

Agents should also consider their ability to manage unplanned changes in funding sources as well as changes in market conditions that may affect its ability to liquidate assets promptly with minimal loss.

### Post Loss Environment

Agents should consider how the impact of a loss may affect liquidity. For example, following an extreme loss there may be delays in collecting reinsurance recoveries or increased trust fund requirements.

Access to money markets and other sources of funding, such as lines of credit, and how these may be affected by adverse underwriting conditions should also be considered.

### Cash calls and availability of Funds at Lloyd's (FAL)

Agents may assume that all FAL is available to meet cash calls subject to the normal cash call timetable. Where a syndicate is fully aligned and FAL is provided in cash and investments, agents may take into account that cash calls may be met outside of the quarterly timetable and potentially within a shorter time period than the normal 35 day notice period.

Subject to this timetable, it is acceptable for agents to recognise capital injections equal to the ICA (before liquidity risk) to meet liabilities as they

**AGENTS SHOULD DEMONSTRATE A CLEAR UNDERSTANDING OF THE TIMING OF KEY CASHFLOWS UNDER STRESS**

**THE ICA SHOULD BE PREPARED ON THE BASIS THAT ALL PROFITS HAVE BEEN DISTRIBUTED**

**AGENTS MUST CONSIDER THE IMPACT OF MATERIAL CASH CALLS ON CAPITAL**

fall due in calculating liquidity risk. When doing so, however, agents should consider the impact of material cash calls on the capital support from members. Lloyd's would expect frequent and severe cash calls that serve to mitigate liquidity risk to be reflected in operational risk and consideration of the syndicate status as a going concern.

### Example Stress Tests

The suggested stress tests below may be used when assessing liquidity risk. This list is not exhaustive and is not a substitute for stress tests relevant to each individual business.

The schedule is not prescriptive, however where Lloyd's is unable to get comfortable with the stress tests used by an agent, these are example stress tests that Lloyd's may require the agent to perform to support the conclusions in the ICA.

- **an increase in attritional claims, with 25% of the projected total claims for the year occurring in one month**
- **100% SLTF funding with large loss**
- **a minimum six month delay in receipt of reinsurance recoveries following a large gross loss**
- **the full funding of US trust fund liabilities at a gross level following a large gross loss, assuming no deferral of CRTF funding**

## DIVERSIFICATION

This section sets out the technical issues regarding the treatment of diversification and dependencies. It has been split into three sections to explain the differing treatment of diversification and dependency between modelled ICAs and stress and scenario ICAs and also how to bring risk types together.

### Modelled ICAs

A number of ICA submissions to date have relied on correlation 'drivers' (eg catastrophe models, inflation and the underwriting cycle) as the mechanism for associating losses, as opposed to an explicit correlation assumption across classes. Such an approach is useful but may have a tendency to understate correlation. Agents should examine the output of such models carefully with regard to the implied correlation as this is an area that Lloyd's will examine closely within an ICA.

In models for insurance risk, agents need to allow for dependency arising from:

- pricing cycles (leading to lines of business with unrelated claims nevertheless being dependent)
- inflation
- trends over time
- pricing inadequacy arising from reserving errors
- any reinsurance linked with insurance risk

Particularly for extreme events, stochastic models should be constructed to allow for a realistic dependency between events. One example of this is how large losses are correlated. Agents should consider whether the model has captured adequately the risk that large losses are correlated as few modelling platforms permit explicit assumptions in this regard. Where there is no explicit assumption, agents should satisfy themselves that the model is sufficiently realistic. At the same time, models should be capable of being understood by non-specialists. It may be sufficient for agents to model dependency in a relatively straightforward manner and to test the results using stress tests of combinations of large losses.

Where a modelled approach is taken, the dependency implied should be examined separately and if necessary, dependence increased either by increasing the correlations or by adding tail dependency. Benchmark correlations and dependency may be obtained from market level data though allowance needs to be made for the greater pooling seen in larger portfolios. A possible further source of benchmark information would be the relationship of the prices of "clash" covers to the prices that the model implies for the same loss combinations.

When using market level data, agents should consider carefully any implied negative correlations occurring naturally within the data and whether these are appropriate at the 1:200 level. Where agents use judgement in selecting correlations, Lloyd's will not expect agents to use negative correlations and will expect the correlations chosen to be sufficiently extreme at the 1:200 level.

**IMPLIED CORRELATION IS AN AREA WHICH WILL BE EXAMINED CLOSELY BY LLOYD'S**

**STOCHASTIC MODELS SHOULD ALLOW FOR A REALISTIC DEPENDENCY BETWEEN EVENTS**

**LLOYD'S WILL NOT EXPECT AGENTS TO USE NEGATIVE CORRELATIONS**

## Stress and Scenario based ICAs

Stress and scenario tests should be based upon a detailed analysis of potential outcomes within a scenario. One of the weaknesses in adopting a solely stress and scenario testing approach is in the aggregation of risks to arrive at an overall capital figure.

Syndicates have generally adopted two approaches to reflect aggregation of risk, namely:

- specification of a correlation matrix between each scenario
- 'ripple effects'

Under the first approach, a range of stress tests is considered and quantified in isolation. A correlation matrix is then specified between risk categories/stress tests (judgementally: high/medium/low correlation) and aggregated to derive an overall capital figure. Under this method, all stress tests for each individual risk must be determined at the same confidence level (99.5%).

Under the second approach a range of scenarios is chosen, and for each one the 'ripple effects' associated with that scenario are also quantified (eg a large loss event leading to reinsurer failure). A special case of this approach is a 'cause and effect' table, where for each defined scenario, the knock-on effect of losses from other pre-defined events is also derived. However, because dependency does not require cause and effect, a cause and effect approach is unlikely to be sufficient without adjustment.

Some agents have applied a simple "weighted sum of squares" calculation which treats the scenarios as independent and is therefore inadequate unless further adjustments are used.

All of these methods also implicitly assume that the shape of the tail is the same for each scenario and for the total; this is only strictly true for elliptical distributions. Agents should therefore satisfy themselves that the assumption is reasonable overall.

## Bringing risk types together

The overall ICA is the capital required for the aggregate of all the risk types. Because of diversification this may be less than the total of the separate calculations.

Agents may use any sound method to aggregate following the same guidance as for stress and scenario ICAs above. In particular, it is acceptable to use a correlation approach, with an appropriately heavy-tailed distribution, such as that derived in the insurance stochastic model if there is one. Assumptions need to be set allowing for the lack of tail dependence in correlation.

Alternatively a "ripple effects" approach may be used, and this is likely to be considered where there is no insurance stochastic model

In either case, or in the method chosen if different, the dependency assumptions should be stated explicitly and clearly justified. Amongst the examples of key dependencies which Lloyd's would expect to see are those between underwriting and reserving risk and also between operational risk and insurance risk.

**THE ICA IS THE CAPITAL  
REQUIRED FOR THE  
AGGREGATE OF ALL THE  
RISK TYPES**

## **OVER-DETAILED ASSESSMENT OF CORRELATIONS IS NOT A SUBSTITUTE FOR A REALISTIC VIEW**

### **The level and method of aggregation chosen should be appropriate to the basis of the ICA and syndicate's tail risk**

Although diversification and dependency are very important, the approach should be proportional. If the tail risk can be shown to be small or to be dominated by one or two key risks, a sophisticated approach may not be needed. Conversely in a complex model it will be necessary to examine closely the diversification effects, including those implicit in the approach. Typically, Lloyd's would expect greater correlation with underwriting risk on longer tail claims, where claims development is slower.

### **Agents should ensure that the post diversification number is reasonable**

Diversification is important but over-detailed measurement or assessment of correlations is not a substitute for a realistic view.

### **Agents will be required to show results at different levels**

The pro-forma will require outputs at intermediate levels of aggregation:

- underwriting risk, all business together
- reserve risk, all reserves together
- total insurance risk (sum of above with explicit diversification credit)
- credit risk, reinsurance credit risk and other credit risk together
- total for each of the other risk types
- total ICA with explicit diversification credit between risk types

### **An agent's own data is unlikely to be sufficient for full calibration**

A dependency table such as a correlation matrix can contain a large number of assumptions, some of which may be implicit. A syndicate's own data is unlikely to suffice for full calibration. In particular, feeding results of actuarial models such as bootstrap directly into the insurance DFA is not generally sufficient and agents should additionally consider market data (adjusted) and management views.

### **Stress tests are vital to substantiate assumptions**

Even when models have been used for some risk types, stress and scenario testing is required as a "sense check" on the numbers.

### **Sensitivity checks**

Reasonable sensitivity checks which Lloyd's would expect agents to consider would include :

- sum of some scenarios from model versus diversified result
- sum of risk types versus total
- consider underwriting plus reserving versus total (with and without reinsurance)
- total for underwriting risk assuming no correlation between main lines of business
- total for reserving risk assuming no correlation between the main reserving classes of business

## **STRESS AND SCENARIO TESTING IS REQUIRED AS A "SENSE CHECK"**



Agents should note that the last two tests should produce answers which are lower than the ICA. If they are regarded as not sufficiently far below the ICA number, this would suggest that the model does not contain sufficient dependency.

## EXAMPLE ICA SUBMISSION FORMAT

The following structure is not mandatory, however, an ICA submission in this layout will facilitate better our internal ICA review and comparison across ICAs. Any agent seeking reduced submission requirements going forward should set out their 2009 ICA in this format.

Where agents do not use this format, the information requested here is still required to be provided as a minimum. Agents should also provide any additional information which they believe is relevant and will assist Lloyd's in the review of the ICA.

The outline of the structure is shown below and further detail of what is required shown overleaf:

### Contents

#### **1 Introduction and background**

#### **2 Executive summary**

- Syndicate information
- Overview of approach
- Overview of ICA result
- Analysis of change
- ICA review and sign off

#### **3 Risk Management summary**

- Risk governance and responsibilities
- Risk management overview

#### **4 ICA methodology and calculation**

- Methodology
- Assumptions
- Diversification
- Data sources

#### **5 Stress and scenario tests**

- Stress and scenario tests applied

#### **6 ICA result and validation**

- Sensitivity analysis
- Validation of ICA

Minimum standards mapping (Appendix 2) must also form part of the ICA submission



# EXAMPLE ICA SUBMISSION FORMAT

---

## 1 Introduction & background

### To include:

objectives  
scope and limitations  
ICA key contact details  
date of SBF on which ICA is based

---

## 2. Executive Summary

### Syndicate Information:

a summary of the financial position of the syndicate and the risk to which it is subject  
current strategy and recent history of the syndicate

brief description of the main capital support and commentary on any significant movements in capital levels since 2008 ICA

details of current and prospective reinsurance (can be by cross reference to the SBF or other submission to Lloyd's)

details of any syndicates due to close at 31.12.08 which are included in the ICA assessment

### Overview of approach:

ICA methodology – describe approach adopted and why appropriate to the syndicate's business

approach to deriving the ICA and how the ICA links with the SBF and risk framework of the syndicate

confirmation of time horizon used

provide details of external consultants or actuaries used in modelling of ICA

### Overview of ICA result:

main findings of the ICA analysis including result set out as per prescribed pro-forma

a comparison of ICA number with ECR and explanation of any material differences

commentary on and ranking of the most material risks to the syndicate, explaining why the level of risk is acceptable or, if it is not, what mitigating actions are planned

identification of the key drivers of the ICA number together with an audit trail and mapping of where they can be found in the submission

### Analysis of change

comparison to 2008 ICA (where produced)

commentary per risk group explaining any changes in methodology or number, including any significant changes in the allocation between risk groups

### ICA Review and sign off

Board/ sub-committee sign off

confirmation that the ICA is based on data and assumptions consistent with SBF

details of any areas where the ICA guidance and minimum required standards have

---

not been complied with together with rationale

---

### 3. Risk Management Summary

#### **Risk governance and responsibilities:**

details of governance over risk and capital management

risk policy covering all risk categories

#### **Risk management overview:**

overview of risk management framework

approach to risk identification and assessment

a clear articulation of the syndicate's risk appetite by risk category

mapping of risk register to FSA risk groups (copy risk register also to be included)

details of risk limits and tolerances and monitoring approach used

---

### 4. ICA Methodology and Calculation

#### **Methodology**

FSA risk categories – how these have been addressed, including detailed risk quantification, modelling approach, testing and rationale (also covering each area in 'minimum required standards'), for:

- insurance risk
- credit risk
- operational risk
- market risk
- group risk
- liquidity risk

an identification of the major risks faced in each of the above categories including any other risks identified (this may take the form of your standard risk register)

details of how new business has been incorporated into the ICA

explanation of how the cycle has been addressed

explain reliance on controls and any significant risks for which reduced capital has been allocated due to such reliance on controls (evidence to support the effectiveness of these controls should also be provided)

#### **Assumptions**

key assumptions within your capital modelling work covering both assets and liabilities, including rationale for the derivation of such key assumptions

details of and rationale for choice of parameters used in determining ICA value and explanation of the relative balance between the syndicate's own data, market data and judgement

details of how parameter uncertainty has been addressed including any prudent assumptions adopted and areas of weakness these are intended to offset

details of the management actions assumed in deriving the ICA and an impact assessment of any such management actions

**In addition, for non aligned syndicates only, detail any changes which materially alter the syndicate's risk profile across different years of account**

#### **Diversification**

details of any allowance made for diversification, including any assumed correlations

---

between risks and how such correlations have been assessed, including in stressed conditions

provide, for information and benchmarking, ICA figures with all correlations assumed to be 100% (ie, no diversification) and with all correlations set to 0 (ie assuming all risks are independent).

include correlation matrix to show dependencies used in ICA

### **Data Sources**

details of the data sources used

assessment of completeness and integrity of data used

---

## **5. Stress & Scenario Tests**

### **Stress and scenario tests applied**

- details of stress tests and scenario analyses the syndicate carried out and the confidence levels and key assumptions behind those analyses
- details of the quantitative results of all stress tests used
- details of combined stress tests used, how these were derived and the resulting capital requirements

explain how stress test numbers have been applied as part of overall ICA calculation

---

## **6. ICA Validation**

### **Sensitivity Analysis:**

This section is in addition to the stress and scenario tests used. It should detail:

the sensitivity tests undertaken to key assumptions and factors that have a significant impact on the ICA including a sensitivity analysis of stress test used

establish which are the key parameters in determining the level of the ICA (eg the most material correlation assumptions) and provide sensitivity analysis around these

where modelled approach is used, provide sensitivity analysis to justify number of simulations used

### **Validation of the ICA:**

the testing and control processes applied to the ICA models and calculations

the senior management or Board review and sign off procedures. It is helpful if a copy can be attached of any relevant report to senior management or the Board.

details of the reliance placed on any external suppliers eg for generating economic scenarios should also be detailed here. In addition, a copy of any report obtained from an external reviewer should also be included.

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**MINIMUM STANDARDS CHECKLIST** (note 1)

	ICA reference	ICA reference
<b>Insurance risk</b> (note 2)	<b>Underwriting risk</b>	<b>Reserving risk</b>
Unexpired risks on 2008 and prior years of account (YOA) and 2009 YOA risk		
Catastrophe losses		
Large individual risk losses		
Attritional loss experience		
New syndicates and/or new classes of business		
Application of reinsurance programme		
Operating expenses		
Use of syndicate data and benchmarking		
Allowance for trends such as inflation		
Dependence between underwriting years		
Operational risks associated with insurance risk		
<b>Underwriting</b>		<b>ICA reference</b>
Underwriting cycle		
Unearned profits		
Reasonableness checks on extremity of gross and net ULRs at 1:200 confidence level		
Breakdown of gross and net ULRs between catastrophe, large and attritional losses		
Breakdown of premium movements		
Growth through additional exposure		
<b>Reserving</b>		<b>ICA reference</b>
Modelling (eg bootstrapping)		
Reserve margins		
Investment income/discounting of reserves		



Latent claims	
Regulatory changes	
<b>Reinsurance</b>	<b>ICA reference</b>
Non matching reinsurance	
Exhaustion	
Post loss impact on cost and availability	
Concentration of reinsurers	
Dispute	
Structured and/or multi year reinsurance policies	
Industry Loss Warranties (ILW)/Original Loss Warranties (OLW) basis risk	
<b>Credit risk - Reinsurance</b>	<b>ICA reference</b>
Gross and net losses	
Link increased probability of reinsurance failure to extreme losses	
Concentration risk	
Reinsurance failure rates should allow for the risk of downgrade	
Duration of recoveries	
Treatment of reinsurance placed with other Lloyd's syndicates	
Treatment of any intra group reinsurance	
<b>Credit risk - other</b>	<b>ICA reference</b>
Brokers	
Coverholders	
Third party claims administrators	
Banks and investment counterparties	
<b>Operational risk</b>	<b>ICA reference</b>
Mapping to the risk register	
Categorisation	

Quantification	
Reliance on systems and controls	
Consideration of the following specific areas where appropriate to the syndicate's business <ul style="list-style-type: none"> <li>○ delegated underwriting</li> <li>○ new syndicates and/or new classes of business</li> <li>○ growth</li> </ul>	
<b>Market risk</b>	<b>ICA reference</b>
Exposures arising from variations in exchange rates, interest rates and investment returns	
The volatility of asset prices and the correlation of investment types	
The correlation between investment and insurance risk following extreme loss events	
Where the expected investment return is higher than the risk free rate	
Investment income/discounting of reserves	
<b>Group risk</b>	<b>ICA reference</b>
Capital	
Group reinsurance arrangements	
Shared platform	
Management resources	
<b>Liquidity risk</b>	<b>ICA reference</b>
Planning and cashflow	
Unexpected events	
Post loss environment	

Notes

- 1) Agents should cross reference each of the minimum standards to the appropriate page or section of their ICA submission. Where an agent considers that any of the minimum standards does not apply to its managed syndicate(s), a brief commentary on the reasons for this should be provided.
- 2) The Insurance risk minimum standards apply equally to underwriting and reserving risk and should be cross referenced to the relevant section of the submission for each. The minimum standards specific only to either underwriting risk or reserving risk are shown separately under the relevant headings above.



## 2009 ICA PRO-FORMA

### Guidance notes for completion

The following numbered notes should be used in conjunction with the ICA pro-forma. They are intended to clarify the data requirements of the pro-forma and to ensure consistency between agents when used for benchmarking purposes. In addition to these notes, a separate document including more detailed formulae for some of the pro-forma entries is available from Lloyd's and agents should speak to their ICA team leader if this is of interest. A separate pro-forma document will apply for run-off syndicates and this will be provided to agents as applicable.

- 1) Pre diversification numbers for underwriting and reserving risk should be quoted on a stand-alone basis **after** diversification across classes of business but **before** diversification with each other and other risk categories. Pre diversification insurance risk (total) should be quoted **after** diversification between underwriting and reserving risk, but **before** diversification with other risk categories. Similarly, pre diversification numbers for reinsurance and other credit risk should be quoted **before** diversification with each other and other risk categories. Pre diversification credit risk (total) should be quoted **after** diversification between reinsurance and other credit risk, but **before** diversification with other risk categories.
- 2) Post diversification numbers should be quoted **after** diversification with other risk categories.
- 3) Underwriting risk is to include losses arising on business earned from 1 January 2009 to ultimate for 2009 and prior years of account. ie it must include all business which is unearned as at the 31 December 2008 valuation date.
- 4) Total of all risk groups post diversification must agree with total of undiversified risk group numbers less overall diversification credit. Total of all risk groups pre diversification must be the sum of insurance risk (total) and credit risk (total) plus the other 4 risk groups and **not** the total of underwriting risk, reserving risk, reinsurance credit risk and other credit risk plus the other 4 risk groups.
- 5) Planned premium and key assumptions used in the ICA must be consistent with those in the current SBF. However, underwriting whole account gross and net ULRs provided in this pro-forma should include both the 2009 YOA premium and unearned premium on the 2008 and prior YOAs (as opposed to just the 2009 YOA premium which 2009 SBF ULRs will contain). For this reason, best estimate ULRs displayed within this pro-forma may not be the same as those within the SBF and agents should provide a reconciliation to confirm that they have been prepared on a consistent basis.

ULRs should be calculated as claims as a ratio of premiums (on a net of commission basis). The 1:200 confidence level should be applied to underwriting risk on a stand-alone basis, ie it should not be the amount for underwriting risk at the 1:200 level of the overall simulation, which may be significantly lower.

- 6) The best estimate and 1:200 whole account underwriting ULRs should be equal to the sum of the individual best estimate and 1:200 catastrophe, large and attritional components. For example, the 1:200 catastrophe ULR should be the expected value of the catastrophe element of the ULR, given that the whole account ULR (on a stand alone basis) is at the 99.5<sup>th</sup> percentile. Guidance on assessing the split between catastrophe, large and attritional at the 1:200 level is included in the detailed insurance risk section of the ICA guidance document. Please note that this split should not just be taken from a single simulation at the 99.5<sup>th</sup> percentile.
- 7) Reserve deterioration at the 1:200 confidence level should be measured from best estimate reserves and should be shown as the difference between the estimated reserves at the 1 in 200 level and the best estimate reserves (i.e. for the purposes of this calculation, no credit should be taken for reserve margins). The 1:200 confidence level should be applied to reserving risk on a stand-alone basis, ie it should not be the amount for reserving risk at the 1:200 level of the overall simulation, which may be significantly lower.
- 8) ECR at 31 December 2008 should be calculated using estimated data; 31 December 2007 ECR should be based on final year end data. The ICA submission should include an explanation in support of any material differences between the ECR and the ICA.
- 9) For sensitivity test 1, the total ICA should be re-stated after changing assumptions in model so that the whole account net ULR at the 99.5<sup>th</sup> percentile (on a stand alone basis) is equal to 140%. This should be achieved by varying volatility assumptions either at the level of key risk component or overall. For sensitivity test 2, the net claims technical provision should be assumed to increase by 40% of its mean booked value at the 99.5<sup>th</sup> percentile (on a stand alone basis). Again this should be achieved by varying volatility assumptions. Sensitivity test 3 should be a combination of sensitivity tests 1 and 2 i.e. the total ICA should be re-stated after changing assumptions in the model so that at the 99.5<sup>th</sup> percentile (on a stand alone basis), the whole account net ULR is equal to 140% **and** at the 99.5<sup>th</sup> percentile (on a stand alone basis) the net claims technical provision is increased by 40% of its mean booked value. The exact way

in which the ICA model is adjusted to achieve these outcomes will vary according to the nature of the model being used. The sensitivity tests are requested to see how the model reacts and it is acknowledged that these levels of deterioration will actually correspond to different return periods for different syndicates.

- 10) Agents should check that the outcome of the sensitivity tests described looks intuitively reasonable. For example, for sensitivity test 1, agents should consider the stand alone net whole account ULR at the 1 in 200 level which is currently used within their model as compared to a 1 in 200 level net whole account ULR of 140%. As well as considering on which side of 140% the current assumed 1 in 200 level net whole account ULR lies (and therefore whether an adjustment which sets it instead to 140% should increase or decrease the total ICA), agents could also consider the effects of diversification within the model and therefore determine what they would expect an upper bound on the change in total ICA to be. For example, if the 1 in 200 whole account net ULR is moving from 120% to 140%, diversification within the model should mean that the total increase in ICA is less than 20% of unearned net premium.
- 11) Premium figures should be quoted net of brokerage and commission, and net of Qualifying Quota Share.
- 12) Technical provisions quoted should be booked amount on a UK GAAP basis.
- 13) Claims technical provisions by year of account are also requested to assist with benchmarking exercise. This does not need to be by pure underwriting year; the oldest open year can be shown including all years which have previously closed into it.

# 2009 ICA SUBMISSION PRO-FORMA SUMMARY

Syndicate Number:

Based on SBF submitted

Date

Version

## Headline Figures

£m

Syndicate ICA as at current year end

ICA Risk Category Breakdown	Pre diversification		Post diversification (2)		Prior year ICA Post diversification	
	£m	%	£m	%	£m	%
	Insurance Risk – TOTAL (Note 1)					
Underwriting risk (Notes 1&3)						
Reserving risk (Note 1)						
Credit Risk – TOTAL (Note 1)						
Reinsurance credit risk						
Other credit risk						
Market Risk						
Liquidity Risk						
Operational Risk						
Group Risk						
Increase applied to prior year ICA						
<b>TOTAL (Note 4)</b>						
Diversification credit between risk categories						
<b>DIVERSIFIED TOTAL (Note 4)</b>						

## Key Assumptions used in ICA (Note 5)

Insurance Risk	Gross %	Net %
Best estimate whole account underwriting ULR: (Note 6)		
Split: Catastrophe		
Large		
Attritional		
1:200 confidence level whole account underwriting ULR: (Note 6)		
Split: Catastrophe		
Large		
Attritional		

<b>Reserving risk</b> (note 7)	<b>Gross %</b>	<b>Net %</b>
1:200 confidence level reserve (31/12/08) deterioration		
Average discount rate used (%) (1 decimal place)		
Average claims tail used for discounting (no of years)		

**Rate per £1**

Assumed USD Exchange Rate as at 31.12.08

**ECR Breakdown** (Note 8)

**31.12.08**  
**£m**

**31.12.07**  
**£m**

Net premium charge		
Technical provision charge		
Asset charge		
<b>TOTAL</b>		

**Benchmark Sensitivity Tests** (Notes 9 & 10)

**£m**

	<b>Sensitivity Test</b>	<b>Revised ICA</b>
1	Whole account net ULR stressed to 140%	
2	Net claims technical provision @ 31.12.08 deteriorates by 40%	
3	Combined stress 1 and 2	

**Financial Information** (Notes 5,11 & 12)

**Gross £m**

**Acq.Costs £m**

**RI share £m**

**Net £m**

2009 YOA planned premium				
2008 YOA planned premium				
Forecast technical provisions at 31.12.08 :				
Claims				
Unearned premiums (net of deferred acquisition costs)				
Other				
<b>TOTAL forecast technical provisions at 31.12.08</b>				

**Additional information to assist with benchmarking** (Note 13)

Forecast claims technical provisions by pure underwriting year of account at 31.12.08.

Year of Account	Gross £m	Net £m
2008		
2007		
2006		
2005		
2004		
2003		
2002		
2001		
2000		
1999		
1998		
1997		
1996		
1995		
1994		
1993		
Total		

**Notes:**

**All numbers on the pro-forma should be calculated and completed in accordance with the guidance notes provided on pages 87-88 of the 2009 ICA Minimum standards and guidance document to ensure consistency across submissions.**

All monetary amounts should be provided in £millions (to one decimal place).

All percentages should be provided to one decimal place where possible.

Exchange Rate should be provided in dollars and cents (ie 2 decimal places).

Total of all risk groups post diversification must agree with total of undiversified risk group numbers less overall diversification credit.

Planned premium and key assumptions used in the ICA must be consistent with those in the current SBF.

ECR at 31.12.08 should be calculated using estimated data; 31.12.07 ECR should be based on final year end data.

Capacity and premium figures should be quoted net of brokerage and commission, and net of Qualifying Quota Share.

Technical provisions quoted should be booked amount on a UK GAAP basis.





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