



**Minutes of the Fourteenth Management Board Meeting  
 from 15:00 to 18:00 on Thursday, 20 January 2000  
 at DP Mann Limited, 9<sup>th</sup> Floor, New London House, 6 London Street, London**

<b>Attendees</b>	:	Simon Jennings	-	Benfield Greig
		David Simmons	-	Benfield Greig
		Dougal Goodman	-	British Antarctic Survey (Chairman)
		Paul Martin	-	Catlin
		Mike Cooper	-	CGU Group
		Peter Taylor	-	DP Mann
		Jonathan Norman	-	Guy Carpenter
		Julia Graham	-	Royal & SunAlliance
		Lance Garrard	-	TSUNAMI
		James Orr	-	TSUNAMI (Secretary)
		Simon Groves	-	Wren

<b>Apologies:</b>	Paul Brand	-	Catlin
	Andrew Dlugolecki	-	CGU Group
	David Stark	-	Guy Carpenter
	Dickie Whitaker	-	Guy Carpenter

**Actions:**

- A. TSUNAMI to respond on whether unused matching Sector Challenge funds could be transferred from companies spending below their commitment to those spending above.
- B. CGU Group to confirm whether they can host the review meeting in late April.
- C. TSUNAMI to present a paper on the activities, success and failures of the initiative, in advance of the review meeting in late April.
- D. Royal & SunAlliance to confirm whether Bob Mendelsohn would be free and willing to speak at the conference at The Royal Society in April
- E. TSUNAMI to distribute the target guest list from the Foundation for Science and Technology event in April 1998 to the consortium companies, as a guide to producing the guest list for Conference at The Royal Society.
- F. Benfield Greig, Catlin, Guy Carpenter, Royal & SunAlliance to confirm whether they support the "Loss Distribution Analysis Research Project – LDARP" proposal, as set out in paper TSU/00/07.
- G. TSUNAMI to inform Simon Groves of the LDARP proposal (TSU/00/07) and Wren to confirm whether support will be provided.



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- H. Royal & SunAlliance to confirm whether they have any objections to new partners participating in the LDARP proposal, who did not support the first phase, under the “Y2K Reporting Project”.
- I. TSUNAMI to ask Simon Groves of Wren whether they have any objection to new partners supporting LDARP that did not support the “Y2K Reporting Project”.
- J. TSUNAMI to ask Bill Fitzgerald to submit an additional proposal for the LDARP proposal to incorporate consideration of the Dynamic Harmonic Regression techniques developed by Peter Young of Lancaster University.
- K. Benfield Greig, Catlin, Guy Carpenter, Royal & SunAlliance to confirm whether they support the “Extreme Value Statistics (EVS) for Application in Insurance and Finance – Booklet, Analysis, Training and Software (BATS)” proposal, as set out in paper TSU/00/08.
- L. TSUNAMI to inform Simon Groves of the EVS – BATS proposal (TSU/00/08) and Wren to confirm whether support will be provided.
- M. All companies supporting either LDARP (TSU/00/07) or EVS – BATS (TSU/00/08) to nominate a representative from their technical staff, to participate in the projects.
- N. TSUNAMI and the consortium companies to restrict publication of the North West Pacific Tropical Cyclones forecast until 1 April 2000.
- O. TSUNAMI to request a PDF copy of the slides presented by Professor Richard Holdaway at the 13<sup>th</sup> Management Board Meeting.
- P. TSUNAMI to send a signed letter of support to the SWIFTEC Urban Flood Risks Research team and to check how the proposed research activities will compare with those of the Institute of Hydrology.
- Q. TSUNAMI to organise the next Management Board meeting, for March 2000.
- R. Dougal Goodman to invite the candidates to run the Climate Research Centre to an evening dinner with the TSUNAMI consortium companies.
- S. Royal & SunAlliance to confirm that they will host the above (P.) dinner.



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**Notes:**

Dougal Goodman opened by thanking DP Mann for hosting the meeting.

**1. Confirmation of Minutes of the Previous Meeting**

The minutes of the previous meeting (TSU/99/24) were accepted without amendment.

**2. Update on Financial Position**

James Orr distributed a summary of the commitments of the initiative (TSU/00/04) and asked members of the consortium to confirm their agreement with the details given (outside the meeting). He had also distributed a summary of each company's position on invoices received from British Antarctic Survey (BAS – sent by fax with TSU/00/04) and asked for the companies' co-operation in ratifying the details and resolving any outstanding issues.

Dougal Goodman explained that James Orr would be leaving TSUNAMI at the end of April 2000 and that the pre-agreed cash calls on the companies included allowance for his employment until the end of November 2000. Dougal would also be leaving BAS at the end of April 2000, but would be responsible for the continued administration of the initiative.

David Simmons asked whether funds secured under the Sector Challenge of the Department of Trade and Industry would be transferable from those companies that had not used the entirety of their original commitment to TSUNAMI to those that had exceeded their commitment. Dougal Goodman agreed to respond on this particular point outside the meeting.

***Action A - TSUNAMI***

**3. Update on Strategy**

Dougal Goodman explained that the development of a successor to TSUNAMI was proceeding with Benfield Greig and BRIT (Wren's owners). Of those other companies involved in development discussions, DP Mann had already declined the offer to invest equity in the successor and Royal & SunAlliance were holding internal discussions at a UK Board meeting next week.

Dougal Goodman confirmed that the existing efforts of the initiative would be focused on ensuring that projects and activities could be smoothly "run-off", following the departure of Lance Garrard and James Orr, beyond April 2000. If succession arrangements could be put in place, then these could be readily incorporated.

Dougal Goodman presented an outline proposal for a review meeting (TSU/00/06) to be held in late April, which would be based on a paper and agenda sent out by TSUNAMI in



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advance of meeting. CGU Group are to confirm whether they can host the event. This meeting would form the basis of a report to the DTI on the initiative and would be expected to last some two hours. Peter Taylor suggested and it was accepted that consortium companies could table papers in response to this document in advance of the meeting.

*Action B – CGU Group*

*Action C – TSUNAMI*

Dougal Goodman explained that an earlier “benchmark” questionnaire had been carried out to measure the impact of TSUNAMI on attitudes in the industry to scientific research. He suggested that similar measurements might be made following the Conference at The Royal Society.

**4. Update on Conference 2000, at The Royal Society**

**a) Speakers**

Dougal Goodman confirmed that John Taylor, Director General of the Office for Science & Technology, would not be available to speak at the Conference. However, he was discussing the possible attendance of one of his direct reports and expected an outcome in the near future.

There was general agreement that Bob Mendelsohn, Group Chief Executive of Royal & SunAlliance, Andrew Dlugolecki of CGU Group, Nick Golden of Royal & SunAlliance and Nick Prettejohn of Lloyd’s of London would be approached as potential insurance industry speakers. Julia Graham is to check on Bob Mendelsohn’s availability.

*Action D – Royal & SunAlliance*

Programmes for the Conference were distributed, with additional copies available on request.

**b) Poster Sessions**

Dougal Goodman explained that the Poster Sessions would allow scientists (and others presenting on science-related themes) to talk to one slide (for a few minutes) on their subject. Also, posters would be permanently displayed during the Conference.

**c) Delegates**



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Dougal Goodman explained that the Conference Organising Committee would be discussing target audiences at a meeting on Friday, 21 January, but that any help provided by the companies in developing a guest list would be greatly appreciated. Dougal recommended the Conference as providing a broad view of the initiative's activities.

Simon Jennings asked that the guest list produced for the Foundation of Science and Technology event in April 1998 should be distributed as a potential starting point.

*Action E - TSUNAMI*

**5. Update on Extreme Value Statistics**

**a) Progress to Date**

Peter Taylor's presentation (TSU/00/10) explained how, one year on from the Isaac Newton Institute programme, the time had come to consider how to exploit the powerful and useful techniques that had been developed. The main barriers to adoption were in successfully translating the techniques to a practical and industry-specific purpose and in addressing attitudes within the companies themselves.

Peter explained how the Extreme Value Statistics Study Group had been established and how work with Dr Mark Dixon of City University, and the work on the "Y2K Reporting Project" by Bill Fitzgerald and Rafael Rosales of Cambridge University had demonstrated progress in this area.

**b) Potential of the Research**

The potential of the initial research under the "Y2K Reporting Project" was discussed. It was explained how analytical tools had been developed to allow the analysis of extremes (maximum observations or, mainly, points above a threshold) within a Bayesian framework (allowing the merging of prior views and actual data).

These developments had been enabled by increased computing power, but it was also clear that data quality and understanding variation over time were critical factors in any analysis.

The potential of these techniques was to look in greater depth at issues of exposure, large and catastrophic claims, and at pricing (re)insurance products above a threshold.

Peter Taylor also explained how non stationary time series and on-line monitoring had also come within the Isaac Newton Institute programme, and that these showed potential.



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**c) Future Activities**

Peter Taylor saw a key challenge in evaluating the techniques, using both existing and simulated data sets. This work could look to take the C (programming language) code developed under the “Y2K Reporting Project” forward as a generic analysis tool. However, critical issues remained in interpreting insurance data and in framing the questions that concerned insurers, which had not been addressed in the initial research.

In conclusion, it was observed that easy wins were possible from applying existing research and that applications can be business-driven rather than research-driven. However, analysing data would take time and insurers do not have time available from their jobs. Moreover, software could be developed for use in answering day-to-day problems, but developing the software would require specialist knowledge, even though it could be done relatively cheaply.

Going forward, Peter Taylor proposed that a focus should be made on education and training, with a particular emphasis on the benefits of adopting the new techniques. Moreover, software should be developed in an accessible environment, such as Excel. Before this, comparison should be made with existing techniques, against prescribed objectives, using both real and simulated data.

Looking to the consortium, Peter Taylor suggested that they be responsible for setting the objectives of the research, paying researchers to carry out the work and should undertake to evaluate the results. He was keen to see the Bayesian techniques supported by DP Mann Limited, as well as the “traditional” Extreme Value Statistics Training, as promoted by Dr Mark Dixon.

**d) Discussion**

Simon Jennings asked whether the analysis allowed prediction beyond the observed maximum. This was confirmed as a key strength of the techniques, which focused on maximum possible values and points in the extreme tail of observed data.

Lance Garrard asked if allowance for inflation and other factors were allowed for in the proposed analysis of data. This was confirmed as a key issue and it was explained that, by making the tools accessible in an Excel environment, existing techniques for “revaluing” past claims data could be readily integrated by actuaries and statisticians. Paul Martin saw this facility as essential to the realisation of the techniques’ value.

Peter Taylor asked that the funding companies be given rights over the tools once they were developed. Dougal Goodman raised concern that quality control on



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product development should be properly managed and that this was unlikely to be achieved within a research environment.

Dougal Goodman explained that he would like to see research consider low frequency variations and cyclical behaviour, using dynamic harmonic regression time series techniques, to look at inflation and other time dependent characteristics in data. These techniques had primarily been developed by Peter Young of Lancaster University.

**e) Project Proposals**

Peter Taylor introduced the proposals set out in papers TSU/00/07 and TSU/00/08. The first was the second phase of research by Bill Fitzgerald and Rafael Rosales (now to be called “Loss Distribution Analysis Research Project” – LDARP) and the second was for the completion of the Extreme Value Statistics Training Course by Dr Mark Dixon of City University.

DP Mann and Catlin, subject to confirmation by Paul Brand, supported proposal TSU/00/07. Benfield Greig, Guy Carpenter and Royal & SunAlliance asked to revert following internal discussions, and CGU Group declined the offer (but agreed to bring the proposal to the attention of their UK General Insurance division). Simon Groves of Wren, who had left the meeting earlier, will also be invited to support the proposal.

***Action F – Benfield Greig, Catlin, Guy Carpenter, Royal & SunAlliance***

***Action G – TSUNAMI and Wren***

Dougal Goodman asked whether DP Mann, Guy Carpenter, Royal & SunAlliance or Wren objected to other companies joining the second phase of research, given that they had not supported the initial phase, under the “Y2K Reporting Project”. DP Mann and Guy Carpenter confirmed that they had no objections and Royal & SunAlliance promised to revert. Simon Groves of Wren will also be asked for his views on this matter.

***Action H – Royal & SunAlliance***

***Action I – TSUNAMI and Wren***

Dougal Goodman suggested and it was accepted that Bill Fitzgerald should be asked to provide an additional proposal for the LDARP research to incorporate consideration of the Dynamic Harmonic Regression techniques developed by Peter Young of Lancaster University.



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*Action J - TSUNAMI*

DP Mann and Catlin, subject to confirmation by Paul Brand, supported proposal TSU/00/08. Benfield Greig, Guy Carpenter and Royal & SunAlliance asked to revert following internal discussions, and CGU Group declined the offer (but agreed to bring the proposal to the attention of their UK General Insurance division). Simon Groves of Wren, who had left the meeting earlier, will be also invited to support proposal.

*Action K – Benfield Greig, Catlin, Guy Carpenter, Royal & SunAlliance*

*Action L – TSUNAMI and Wren*

Peter Taylor explained that, if supported, he would require nominees from each of the companies of analysts who would test the tools and analytical techniques.

*Action M – Consortium Companies Supporting Projects*

**6. Information Paper**

**a) Satellite Risks**

Dougal Goodman confirmed that this project was currently on hold, pending a decision on funding from Marsh Aviation, which resulted from Guy Carpenter potentially exhausting their original commitment to TSUNAMI.

**b) Tropical Cyclones Forecasting Project**

Lance Garrard explained that the Met.Office was developing a proposal with University College London to continue the forecasts developed under the project beyond the initial research phase. The expected cost would be some £60,000 per annum and the output would cover each of the three main tropical cyclone basins.

Catlin explained that they were not interested in supporting further development of a project whose value they were not able to realise and asked whether the existing research could be used to provide a cheaper product.

CGU Group confirmed their willingness to participate in the project, provided additional support was provided to help share the costs. Benfield Greig confirmed that they were positively minded towards the project.

DP Mann and Guy Carpenter suggested that the output from the project needed to be “more attractive” to capture the interest of the industry, and suggested that the



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success of the University College London team in producing the UK storminess forecasts should be emphasised.

With specific regard to the North West Pacific forecast, David Simmons explained that market sentiment in Japan (specifically) would not look kindly on the forecast (of above average activity) being released before the market renewal date of 1 April 2000. The Board accepted that the forecast would be kept private until the planned public release date, of 1 April.

*Action N – TSUNAMI and Consortium Companies*

**7. Any Other Business**

**a) Rutherford Appleton Laboratory**

Dougal Goodman tabled a paper from Rutherford Appleton Laboratory (RAL), which set out a proposal to study the physical mechanisms that might link observed fluctuations in the Earth's magnetic field and subsequent earthquakes.

David Simmons and Dougal Goodman had visited RAL, and had encouraged the submission of the proposal, further to the presentation by Professor Richard Holdaway at the 13<sup>th</sup> Management Board Meeting. James Orr was asked to contact Professor Holdaway, to obtain computer copies of the slides he had presented, which would be placed on the secure area of the TSUNAMI Web Site.

*Action O - TSUNAMI*

**b) British National Space Centre**

Dougal Goodman explained that he would be meeting the new head of BNSC, Dr Colin Hicks, on 25 January and that he would like to present a paper setting out potential links with the insurance industry following that meeting.

**c) Managing Uncertainty**

Dougal Goodman explained that the Isaac Newton Institute for Mathematical Sciences was providing funding for a short programme in 2001.

In anticipation of this event, Dougal explained that he was now working on a cross research council (Engineering and Physical Sciences Research Council (EPSRC), Natural Environment Research Council (NERC), and the Economic and Social Research Council (ESRC)) thematic programme, looking to make up to £200,000 available for research on related topics.



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**d) SWIFTEC Urban Flood Research Centre Proposal**

Dougal Goodman presented a letter drafted by James Orr in support of a proposed research centre, to be established in Dundee, to analyse flood risk in the urban environment. This was supported by the Board and will be sent to the scientists leading the proposal. No financial commitment was requested.

A request was made that TSUNAMI check the proposed activities of SWIFTEC against related activities within the Institute of Hydrology.

*Action P - TSUNAMI*

**8. Date of Next Meeting**

James Orr is to organise the next meeting for March 2000.

*Action Q - TSUNAMI*

**9. Presentation by Dr Ian Dwyer, NERC, on the joint research council initiative to fund a new Climate Research Centre**

Dr Dwyer explained that some 25% to 33% of NERC's budget was committed to research on climate change. Following the OST's Comprehensive Spending Review, an additional £5million had been made available to NERC, to spread over five years to support a Climate Research Centre. £4million from EPSRC and £1million from ESRC matched this commitment.

Unusually, there would be no tie-in to the fields of research (Natural, Technology or Social Environments) that the funds would be distributed amongst. This would allow the creation of a true multidisciplinary research programme. With complex interactions between the three environments, it was recognised that solutions, discussions and research would need to be integrated.

Four broad areas of scope had been identified:

- 1) Integrated Modelling and Assessment;
- 2) Impacts and Adaptation;
- 3) Energy Issues;
- 4) Greenhouse Gases.

It was expected that topic 2) would be of particular concern to insurers.



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- The centre would aim to compliment existing research by The Hadley Centre, the UK Climate Impacts Programme, Potsdam, MIT and RIVM in the Netherlands.
- Two leading candidates, University of East Anglia and Imperial College, now remained in contention and an adjudication was expected in April 2000, with the centre becoming operational in autumn 2000.
- It was confirmed that the Medical Research Council and The Biotechnology and Biological Sciences Research Council had expressed an interest in participating in the research centre at a later date.
- The geographical scope was expected to focus on the developing world and the UK, but would have to take account of the impacts from and to the developed world.
- The research would aim to be relevant to the development of policy, but would not be tied to defining government policy in dealing with climate change.
- The barriers to multidisciplinary research were seen as both cultural and administrative (within the operational systems of the research councils)

Finally, Peter Taylor suggested that the winners, or leading candidates, be invited to meet with the TSUNAMI consortium, at an evening dinner. Royal & SunAlliance offered to host the dinner, subject to the availability of facilities. Dougal Goodman agreed to extend this invitation to the candidates.

*Action R – Dougal Goodman*

*Action S – Royal & SunAlliance*