



InterRidge

Steering Committee Meeting 1995 Report

GEOMAR
Kiel, Germany
11 & 12 September, 1995

Chair:
Roger Searle

Table of Contents

List of Participants and Observers	i
Agenda	iii
Steering Committee Meeting 1995 Report	1
1.0 Introduction and Welcome	1
2.0 Apologies for Absence	1
3.0 Minutes of 1994 Meeting	1
3.1 Matters Arising	1
4.0 New Membership	1
4.1 Spain	1
4.2 Germany	2
5.0 Report of the Co-Ordinator	2
5.1 InterRidge membership	2
5.2 InterRidge News	2
5.3 Office Administration	3
5.4 WWW	3
5.5 Piggyback Project Brokerage Proposal	3
6.0 InterRidge Program Plan Addendum 1994	3
6.1 Matters Arising	3
7.0 InterRidge Phase 2 Projects	4
7.1 SWIR Project Plan	4
7.2 Arctic Mapping Global Studies Project	6
7.3 Quantification of Fluxes at the Mid-Ocean Ridge	6
7.4 4-D Architecture of the Oceanic Lithosphere	7
7.5 Event Detection and Response	9
7.6 Back-Arc Basin Databases	9
7.7 Global Digital Database - RIDGE Project	9
7.8 Global Digital Database Committee Report	10
7.9 Biological Studies <i>Ad Hoc</i> Committee Report	11
7.10 Project Management	13
8.0 Interaction with Other Organisations and Programs	14
8.1 SCOR Affiliation Status	14
8.2 SCOR Working Group 99	15
8.3 Ocean Drilling Program	16
8.3 FARA/InterRidge Symposium	17
9.0 InterRidge Budget	18
9.1 Invoicing Procedure and Currency	18
9.2 Funding for Workshop Participants	19
10.0 InterRidge Office Transfer	19
11.0 InterRidge Representation	19
11.1 Working Groups	19
11.2 Steering Committee	19
11.3 National Correspondents	19
11.4 Liaisons with Other Organisations	20
12.0 Provisional Calendar	20

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InterRidge Steering Committee AGENDA

Introduction and Welcome (Chairman)

Apologies for Absence

Minutes of 1994 meetings

To accept the minutes of the 1994 meetings (**Documents A & B**, previously circulated).
Matters Arising.

New Membership

Endorsement of Spain as a new Principal Member Nation and of Spain's representatives on the Steering Committee.

Endorsement of Germany and Portugal as new Associate Member Nations and of Germany's representative on the Steering Committee.

General Organisation of meeting and agreement on meeting agenda

Report of the Co-ordinator

To receive the report of the co-ordinator on activities completed during the year to date (**Document C**). Discussion.

InterRidge Program Plan Addendum 1994

To ratify the InterRidge Program Plan Addendum 1994 (**Document D**, previously circulated).

InterRidge Phase 2 Projects

To review progress made during the last year and agree direction and action for the upcoming year.

To discuss project management (**Document E**).

To receive report of the Biological Studies *Ad Hoc* Committee

(Desbryères)

To receive project reports:-

- SWIR Project (Langmuir)
- Arctic Oceans Mapping (Rihm)
- Quantification of Fluxes Experiment (Sinha)
- 4-D Architecture of the Oceanic Lithosphere Experiment (Detrick, Searle)
- Back-arc Basin Database (Sloan)
- Event Detection and Response (To be arranged)
- Global digital database. (Detrick)

Discussion.

Interaction with other organisations and programs

To discuss SCOR Affiliation status.

To receive reports on contacts with other organisations and programmes as follows:

- SCOR working group 99 (Sinha)
- ODP (Fox)
- FARA/MAR 1996 Symposium (Needham, Langmuir)

Discussion.

InterRidge Budget

To receive a financial report from the Co-ordinator (**Document F**).

To discuss the possibility of funding for workshop participants.

To discuss invoicing procedure and currency.

InterRidge Office Transfer

To discuss and confirm the end of the Durham mandate. To discuss and establish a calendar and procedures for calls for tender, their processing, Co-Ordinator's salary, and associated budget issues.

InterRidge representation, National Correspondents and membership of committees:

To discuss and decide on any suggestions for possible additions and changes concerning

- (i) InterRidge liaison people to other programmes
- (ii) National Correspondents
- (iii) membership of the Steering Committee
- (iv) membership of the Working Groups

Calendar for 1996

To receive and if necessary update the provisional calendar presented as **Document G**.

Any Other Business

Summary of Principal Conclusions

InterRidge Steering Committee
Kiel, 11-12 September 1995
Report

1.0 Introduction and Welcome

R. Searle, as Chair, welcomed members and observers to the 1995 meeting of the InterRidge Steering Committee and initiated the proceeding by ceding the floor to H. Schmincke, the meeting host at GEOMAR.

H. Schmincke welcomed the Steering Committee to GEOMAR and expressed his enthusiasm for Germany's continued participation in InterRidge. With the addition of state funds to the GEOMAR budget, Germany will become a Principal Member in 1996. The co-ordination and leadership of DeRidge has been turned over to R. Rihm. The DeRidge Community currently numbers approximately 300 members working in the fields of paleo-oceanography, paleo-geography, environmental geology, sediment chemistry and volcanic petrology. GEOMAR is undergoing a period of growth, extending its facilities and constructing a new building to house them.

2.0 Apologies for Absence

Apologies were received from J. Cann who was invited to attend in his capacity as Active Processes Working Group Chair.

3.0 Minutes of 1994 Meetings

The minutes of the 1994 InterRidge Steering Committee Meetings were tabled and accepted.

3.1 Matters Arising

SOSUS array operating status

In the Atlantic, the Bermuda array has been shut down but the Iceland array is still running. A recent study revealed that tracking channel changes were not recorded making identification of arrays impossible and major time shift sources are unknown. A report for the study has been made to the Naval Research Laboratories (NRL) but it may not be made available to the public. It is estimated that corrections to the system could be made within 6 months to a year but that archived data is unrecoverable.

The Northeast Pacific array is still maintained and operating. One section of the array has broken down and the US Navy is committed to repair it.

IRSC representation for ridge crest biologists

R. Lutz was nominated as a possible representative in October 1994. This nomination did not receive unanimous approval from the Steering Committee and additional recommendations were called for. The following three nominations were made and are listed in order of preference:

- L. Mullineaux US
- D. Dixon UK
- K. Stetter Germany

ACTION:

The InterRidge Office will issue sequential invitations to the nominees until a positive response is received.

4.0 New Membership

The Steering Committee endorsed Spain as a new Principal Member Nation and welcomed Spain's representatives, M. Canals and J.J. Dañoibeitia, to the Steering Committee.

The Steering Committee endorsed Germany and Portugal as new Associate Member Nations and welcomed Germany's representative, R. Rihm, to the Steering Committee. No nomination for Portuguese representation has yet been made.

4.1 Spain

M. Canals and J.J. Dañoibeitia expressed their thanks and presented a brief summary of ridge crest research being carried out in Spain.

The Spanish ridge crest studies program originated with the launching of the RV *Hesperides*, which is capable of deep multi-channel and single channel seismic surveys with a 300 m streamer, an 85 m long streamer, and 2 compressors. It also has SIMRAD EM12 Expanded and EM-1000 swath mapping systems with side-scan sonar capabilities, gravimeter and magnetometer and the capacity to process data. Its most recent survey was a multi-channel seismic study of deep crustal structure of the area around Easter Island (See *InterRidge News*, vol. 4, no. 1). The objective of this project was to examine the nature of the boundaries and interaction between the Easter Microplate, the hot spot and volcanism by integrating interpretations of the seismic data with swath mapping.

The Spanish ridge studies program has been active since 1992, primarily focusing on work in the Antarctic region particularly the Scotia Sea and Bransfield Basin. This work has largely consisted of multibeam bathymetry mapping, seismic reflection, magnetics, gravity and the long-term deployment of thermistor chains. Future plans include a joint funded project with Woods Hole Oceanographic Institution (WHOI) to carry out a geophysics reconnaissance survey around the Galapagos Islands in 1996. Another project is planned to survey the Gulf of California where the Tamayo Fracture Zone intersects the trench to determine the interaction of the two plate boundaries and the effect of the subduction of the Rivera Plate. This project will be carried out using land stations, the RV *Hesperides* and, provisionally, two Mexican ships to shoot seismic lines.

Antarctica remains a scheduling priority for the RV *Hesperides* for at least 2 months a year. This leaves it free for up to 8 months of scientific work and its transits to and from the Antarctic make it available for work in the southern oceans. In view of this, Spain may be able to contribute 1 or 2 legs aboard the RV *Hesperides* to the SWIR Project.

4.2 Germany

R. Rihm thanked the Steering Committee and gave the following summary of the DeRidge agenda. Five thematic workshops are planned for 1996: North Atlantic and Arctic Ridge Studies - H.-J. Wallrabe-Adams; Indian Ocean Ridges - M. van Greven and P. Halbach; East Pacific Rise - G.A. Dehghani; The Red Sea - R. Rihm; Back-Arc Basins - P. Herzig. Further details were given in presentations made during the InterRidge/DeRidge Science Day held on Wednesday 13th September (see program; Appendix A). The first issue of the DeRidge Newsletter, published in English and devoted to documentation of current and recent ridge-related research in Germany, appeared in September 1995.

5.0 Report of the Co-Ordinator

The Steering Committee received the written report of the Co-Ordinator on activities completed during the year to date. Points specifically touched upon during the report presentation were: current InterRidge membership, *InterRidge News*, InterRidge Office administration, recent development of the InterRidge World Wide Web (WWW) home page, and the possibility of InterRidge acting as a 'broker' for piggy-back projects.

5.1 InterRidge Membership

InterRidge Membership in 1995 consists of 5 Principal Members, 2 Associate Members, and 11 Corresponding members. Among the 18 member nations, 5 are new or upgraded since the last Steering Committee Meeting. Spain upgraded from Corresponding to Principal Member, Germany and Portugal upgraded from Corresponding to Associate Members. India and Switzerland became new Corresponding Members.

ACTION:

It was decided that invitations to Australia and Canada to become Associated Members should be reiterated for 1996 and new contacts should be made with Taiwan. In addition, the Spanish contingent on the InterRidge membership database should be updated.

5.2 InterRidge News

As of September 1995, the circulation of *InterRidge News* was 1777. There is an increasing interest in *InterRidge News* within the international community evidenced by numerous new requests to be added to the circulation list and by increasing numbers of unsolicited articles received by the Office. This has enabled us to produce a more informative publication with a larger scientific content. It has, however, had a negative effect on the budget as the increasing length of the newsletter has corresponded to increased printing and postage costs. One solution would be to strictly

enforce limits on the manuscript length and number of figures for articles. Another suggestion for altering the structure of the newsletter is to create feature columns for each of the Phase 2 projects. One such feature has already been initiated on the Indian Ocean.

ACTION:

It was agreed that articles should be limited to about 4 manuscript pages and no more than 3 figures. They should focus on recent or preliminary results and the content should not have been published elsewhere.

Initiation of Phase 2 project columns was seen as a positive development in keeping with the evolution of the InterRidge Program. An effort will be made to include these new feature columns as a function of available material in the upcoming Fall/Winter issue.

Tables of contents of newsletters published by various national programs will be included in the 'Updates' section.

As the above changes are unlikely to reduce the length of the newsletter, the Co-Ordinator will look into using thinner, lighter weight paper to bring printing and postage costs down.

5.3 Office Administration

With a view towards more efficient operation of the present Office and an easy transfer at the end of the Durham term, a major effort is being made to standardise, expand and update the maillist database and electronic directories; standardise workshop organisation procedure and report production.

5.4 WWW

Since the last Meeting of the Steering Committee, the InterRidge Home Page has been created and is accessible on the WWW. Its features include information about InterRidge and its member nations; the InterRidge Researcher Electronic and Ridge Crest Biologist Directories; the Back-Arc Basin database index, geochemical database and geophysical database; links to other sites concerned with ridge studies and ship information; and a mirror of some of the ship information and scheduling contained on the University of Delaware Oceanic site.

ACTION:

In addition to the existing features, *InterRidge News* will be posted on the WWW.

5.5 Piggyback Project Brokerage Proposal

The InterRidge Office could act as a broker matching potential piggy-back projects with investigators whose funded and scheduled cruises have the time and space to carry them out. Proposed projects and announcements of open ship time could be posted on the WWW and advertised in *InterRidge News*.

ACTION:

The Steering Committee approved of the proposal to provide this service to the international community. A call for piggy-back projects and open ship time will go out in the Fall/Winter 1995 issue of *InterRidge News* and over the e-maillist.

6.0 InterRidge Program Plan Addendum 1994

The InterRidge Program Plan Addendum 1994 was tabled and accepted.

6.1 Matters Arising

Yearly Indian Ocean Meeting

It was decided not to schedule yearly Indian Ocean Meetings as was recommended by the participants of the Indian Ocean Meeting in Baltimore 6 April 1994. Meetings will be held as the need for planning or presentation of results demands.

Arctic Ocean data archive

This project would create a publicly accessible archive of data from the Arctic Oceans. Data is currently concentrated in Germany, Lamont, Canada and Russia. Steps are being taken to secure the release of this data. Mark Langseth at Lamont is working with the Canadians who in turn are working with the Russians. In Germany, R. Rihm is encouraging contributions to the archive.

ACTION:

Further promotion of this archive would result from establishing a liaison with the Nansen Arctic Drilling Project and by creating an Arctic Oceans feature column in *InterRidge News*.

The White Sub

Although presentations of InterRidge endorsement was made at the end of 1994, the report containing the decision to either go ahead with conversion of the US Navy nuclear submarine or scrap the project is still unavailable. At this point, it is doubtful that the project will go ahead.

7.0 InterRidge Phase 2 Projects

7.1 SWIR Project Plan - C. Langmuir

(A summary outline of the report is presented here. Further details can be found in the draft report distributed at the meeting.)

The Southwest Indian Ridge (SWIR) was chosen as a focus for the Global Studies Program because it has an essentially constant, super-slow spreading rate along its entire length and exhibits two contrasting types of morphology. While this makes the area tectonically interesting, there remain some problems associated with this zone. High southern latitudes make shipboard work difficult in this area. As yet no regional hydrothermal surveys have been carried out and hence no biological data is available. The logistical problems associated with work in high latitudes has, in the past, led to an unco-ordinated approach of investigation through individual cruises. The logistical difficulties could be more effectively coped with through co-ordinated collaboration.

Characteristics of the Southwest Indian Ridge:

- (A) Morphology and segmentation
- (B) Regional geophysics
- (C) Crustal structure and crustal thickness
- (D) Petrology and geochemistry
- (E) Distribution and characteristics of hydrothermal sites and associated biology

Scientific Problems to be Investigated

(A) How do the various aspects of crustal accretion respond as the spreading rate becomes very slow? Do models based on faster spreading rates adequately describe phenomena at super-slow ridges? The following aspects should be considered:

- (i) Crustal structure and geophysics
- (ii) Crustal composition
- (iii) Hydrothermal activity
- (iv) Biology

(B) What are the effects of variation in magmatic budget at constant spreading rate? How do such effects vary as a function of spreading rate?

(C) What are the characteristics and scale of the geographical boundaries for crustal composition, and biogeographic provinces between the Atlantic and Indian Oceans?

General Strategy

The general objectives that should be accomplished by the program are:

- To provide the long wavelength perspective in terms of depth and basalt chemistry.
- To provide the critical data set for a super-slow ridge that can be compared to faster spreading ridges: for the range of axial depth and segmentation style, we need, for multiple segments, multibeam bathymetry, gravity and magnetics surveys, seismic experiments that provide crustal structure information, closely spaced rock sampling, and an assessment of the hydrothermal budget.
- To locate specific hydrothermal sites, preferably in regions with different styles of segmentation, and lead to sampling of water and the associated biological community.

The primary emphasis of the program in terms of hydrothermal prospecting and detailed experiments should be on the northeastern portion of the SWIR.

Elaboration of specific program components

Three different regions, representative of the range in magmatic budget and segmentation characteristics, would be selected for intensive study on the segment scale, with the ultimate aims of investigating and understanding the range in styles of crustal accretion at super-slow spreading rate and of identifying, observing and sampling hydrothermal sites and associated life.

- (A) Regional high resolution bathymetry with underway geophysics
- (B) Regional hydrothermal surveys
- (C) Investigation of 3-D crustal structure
- (D) Regional sampling and detailed sampling of individual segments
- (E) Detailed hydrothermal and biological studies

Specific Project Design

- (A) One leg of multibeam bathymetry and underway geophysics.
- (B) One leg of petrological sampling.
- (C) One or two legs of a deep towed instrument package that would provide side-scan and hydrothermal sniffing.
- (D) A seismic experiment to evaluate crustal structure in the three regions.
- (E) An ROV leg with the aim of locating and photographing two active hydrothermal sites preferably in two of the three regions.
- (F) A submersible leg to dive on the two hydrothermal sites and sample water, sulfides and animals.

Two additional legs would be needed to investigate the southwestern portion of the ridge, for regional bathymetry, geophysics and sampling. These legs will be necessary to answer questions about the SWIR as a gateway between the Indian and Atlantic Oceans, and for comparison of geological, geophysical and petrological characteristics of the two ends of the ridge.

Discussion and Comments

A Draft of the Project Plan and a proposed cover letter to be signed by R. Searle was distributed with the thought that the way in which the various national committees are approached concerning the project is very important and deserves some consideration. Steering Committee Members were asked for their input in drafting the cover letter so as to achieve the maximum positive effect in their own countries.

It was decided to address the letter to the InterRidge National Correspondents asking them to bring it to the attention of the national program. There will be a need for comments and endorsement of the project and input on the calendar and how their country might contribute to the project.

Comments on the wording of the cover letter were made and noted. It was thought more advisable in the case of Japan to send the cover letter and Project Plan to JAMSTEC rather than ORI. The BRIDGE geographic exclusion should be addressed in the letter to the UK Correspondent. A copy will be sent to all Administrative Correspondents.

Time frame:

The number of legs required may have been underestimated and a longer time frame may have to be considered. Funding of individual legs and their sequence may depend on demonstrating that the foundation work has been successfully completed.

Data distribution:

A co-ordinated strategy will be required at the national level for data to be passed on to the next cruise to work in the area.

Distribution of the Project Plan Document:

The widely varying funding structures in different nations complicates a large scale collaborative project such as this one. The leverage of national ridge studies programs endorsement and commitment will make individual proposals stronger. Individual surveys must be shown to be part of an integrated collaborative international project plan to which InterRidge and its member nations are committed.

The finalised SWIR Project Plan document should be distributed to funding administrators and ship operators and managers so that the people who control ships, ROVs, submersibles, etc. will

be aware of what equipment will be required when and where. This will increase the likelihood that the equipment will be in the Indian Ocean in the right time framework.

Ships and submersible which may be available:

The RV Hesperides is capable of towing TOBI and has an EM12 Extended swath bathymetry mapping system that covers 3.5 times the water depth. A demand has been made to modify the A-frame so that it could be capable of deploying a submersible.

The RV Sonne now has a GD deep tow with a fiber optic cable. A recent call for expressions of interest to work with the Sonne in the Indian Ocean has had some response which will probably lead to work being carried out there.

Shinkai 6500 has been invited to make 10 dives in the Indian Ocean in 1998. In order for these dives to be approved site surveys must be completed.

Action:

The InterRidge Office will circulate the SWIR Project Plan to all national Correspondents requesting the endorsement of their national program and an expression of interest and commitment. They will also be asked to solicit proposals from the community in their country and to give an idea of what resources might be contributed. A cover letter written by C. Langmuir will accompany the Project Plan outlining the data sharing protocol, calendars, etc. The document should be circulated in time for it to be presented and discussed at the RIDGE and Dorsales meetings to be held in November.

The InterRidge Office will request that individual investigators for Indian Ocean legs notify the InterRidge Office of submitted proposal, funding decisions, scheduling, etc. This information will be used to aid InterRidge in its co-ordinating role for this project.

7.2 Arctic Mapping Global Studies Project - R. Rihm

The workshop, held in November 1994, was attended by about 50 people from 8 countries. The objectives of the workshop were:

- To make known existing geological, geophysical and biological data sets from the Arctic to researchers interested in this region through a series of presentations which also served to identify major gaps in data coverage;
- To correlate different data types in key regions as a first step in the compilation of a data synthesis which will lead to an integrated interpretation;
- To define approaches and implementation plans as part of co-ordinated international strategies to overcome logistical challenges and extend data coverage.

A lot of data was unearthed whose existence had previously been unknown. It was noted that a significant amount of data held by the military is currently inaccessible to the public. It was agreed by workshop participants that links with the Nansen Drilling Program would be more appropriate than with the Ocean Drilling Program for work in the Arctic. It is felt that the workshop presentations and discussion served to focus the interest of the international community on mapping in the Arctic Oceans and that this interest will persist as the report is published and work continues.

ACTION:

The InterRidge Office will publish the workshop report in conjunction with the Alfred Wegener Institute, R. Rihm acting as liaison. The report will be distributed through both organisations.

7.3 Quantification of Fluxes at the Mid-Ocean Ridge - M. Sinha

Out of the two InterRidge workshops held on fluxes at the mid-ocean ridge, one in Durham in September 1993 and the other in Cambridge in June 1995, a coherent body of work has arisen aimed at the investigation of heat, energy, chemical and mass fluxes involved in the accretionary process. This investigation is based on the concept of a "box" experiment on the axial segment length scale and extending from the upper mantle to the water column. Its object is to measure all fluxes across all boundaries and certain fluxes within the box itself.

Fluxes to be measured are:

- Magmatic - within the mantle, mantle to crust and intercrustal
- Hydrothermal - within the crust, to water column, recycling, chemical export
- Thermal - energy
- Chemical - alterations of crustal (and mantle) rocks
- Biological - productivity and gene flow

Isolated consideration of fluxes is not possible, therefore, this experiment must be integrated with the InterRidge Phase 2 Projects and other experiments. This can best be accomplished by coordinating appropriate parts of different projects and by carrying out these experiments at the same site.

Major linkages exist with:

- Mantle fluxes - MELT
- Crustal magma fluxes - 4-D Architecture of the Oceanic Lithosphere
- Chemical history - Ocean Drilling Program
- Vent scale fluxes - Observatories

Experimental approach

The approach to quantification of fluxes in a box experiment can be summed up by the following equation.

$$\text{flux into the box} - \text{flux out of the box} = \text{vent input}$$

This is best carried out at a 'bathtub' segment, one which has a deep axial valley and is closed off at least one end. The 29°N segment was selected as the preferred site because it meets these criteria. Its northern end is closed and its southern end, while being open, can be easily instrumented with current meters and sediment traps to measure the flux through the gap, at and below plume level. Other sites taken into consideration were TAG, Snake Pit and Rainbow. The 29°N segment was selected because of its 'bathtub'-like morphology and because it is a known site of hydrothermal venting. Although the hydrothermal activity at the 29°N Broken Spur site is limited, signals of additional venting have been detected within the segment.

Discussion at the Cambridge workshop pointed out some of the difficulties in the site selection process. For example, was there correct and proportional representation of InterRidge nations at the workshop? What is the extent of InterRidge's influence in directing individual investigators towards a given site?

Discussion and Comments

A 'bathtub' experiment is only valid if one assumes that venting is steady state. For this reason, slow-spreading ridges, because of their complexity and exaggerated temporal and spatial heterogeneity, are probably not the best place to site such an experiment. It would be more practical to suit the site to the experiment.

It might be best to gain further understanding of the processes involved in hydrothermal venting rather than allow the planning to lead the science.

7.4 4-D Architecture of the Oceanic Lithosphere - R. Detrick

Two major workshops have addressed the problems involved in determining the 4-D architecture of the oceanic lithosphere, the Durham workshop (Sept. 1993) focusing on axial segmentation and the workshop held in Boston (Sept. 1994). The major scientific objectives have been identified as the following:

- What is the 3-D nature of the magmatic plumbing system of a spreading segment?
- What is the 3-D nature of hydrothermal circulation?
- How is extension partitioned between faulting and magmatism?
- What are the fundamental causes of segmentation and what controls temporal variability in spreading segments?

The recommendations of the 4-D workshop fall into two categories:

- Type One (#1) - Those requiring full multi-national participation (instrumentation, ships, etc.)

- Type Two (#2) - Those that can successfully be completed by individual investigators or nations but would benefit from co-ordination or integration provided by InterRidge. Other ways in which InterRidge could contribute to this effort are through facilitation of communication (*InterRidge News*, on-line information and bulletin boards) and data exchange (on-line databases).

The scientific objectives above could be addressed by experiments carried out at a slow-spreading and at a fast-spreading ridge.

Slow-spreading Ridge - The strategy at a slow-spreading ridge would consist of a series of nested 'box' surveys with different scales of resolution. In addition, a near bottom experiment at a smaller scale would provide detailed 'ground truthing'. Coverage off-axis would extend to about 10 Ma old lithosphere and along-axis would include the adjacent segment. The sites considered for this experiment were MARK, TAG, 29°N and 35°N.

The types of studies to be included in this experiment are:

- 3-D geological and geophysical surface mapping out to 10 Ma (#1)
- Deep-towed, high resolution surveying and bottom experiments (#2)
- 3-D seismic investigation of crustal and upper mantle structure (active and passive tomographic experiments) (#1)
- Long-term* monitoring of seafloor deformation using seismic and geodetic techniques (#1)
- Dredging, rock coring, submersible sampling of crustal and upper mantle rocks (#2)
- Drilling (#1)

* 2-3 years initially

Fast-spreading Ridge - Since exposure of deep crustal and mantle rocks is not as readily available at fast-spreading ridges, site selection is limited to specific locations. The locations selected are 9°-11°N and 14°-18°S on the East Pacific Rise (EPR), and the north wall of Hess Deep. Strategy for this experiment would include structural and segment-scale active processes studies of the EPR and structural studies of the lower crust and upper mantle exposed in tectonic windows in Hess Deep.

The types of studies to be carried out at Hess Deep:

- Surface and near-bottom bathymetry and geophysical mapping (#2)
- Correlation of outcrop geology with geophysical structure (#2)
- Drilling and bore hole experiments (#1)

The types of studies to be carried out at the EPR;

- Repeat bathymetry and geophysical mapping (#2)
- Sampling and distribution of lava flows (#2)
- Vent distribution and faunal distribution (#2)
- Long-term* monitoring of seafloor deformation using seismicity and geodetic techniques (#1 & #2)

* 2-3 years initially

Points requiring Steering Committee discussion or InterRidge Office action:

- Site selection for MAR 4-D architecture experiment
- Appointment of project leaders and co-ordinating committees
- Establishment of Internet-accessible catalogues of recent and pending surveys
- Co-ordination of GIS database for site selected
- Development of a project plan for Type #1 experiments
- Co-ordination of ODP proposal submission

Discussion and Comments

Since this is too large a project to be closely co-ordinated by InterRidge, individual investigators or nations should be encouraged to peruse those parts of the experiments which do not require multi-national participation. InterRidge should focus on co-ordinating type 2 aspects of the experiments.

Selection of 4-D Experiment fronts for InterRidge focus:

- ODP proposal co-ordination - A thorough understanding of the regional geology ('site survey') is required for proposal approval. It is possible, however, to submit a generic proposal for which the background work has not yet been completed. In parallel with generation of a generic proposal, field work to complete the site survey could be carried out. This may be the best approach since the technology for on-axis drilling will not be completed for another 2-3 years. Justification for ODP drilling exists in the fundamental differences in crustal structure reflected in the gravity signal at the ridge.
- Tomography experiment - active source crustal tomographic experiments could be mounted immediately. At the segment-scale this would definitely be a Type #1 experiment.

7.5 Event Detection and Response

National Correspondents, Administrators, ship operators and scientists should be included on an electronic maillist concerned with event detection and response. Funding agencies might be coaxed into maintaining a reserve of money for event response.

7.6 Back-arc Basin Databases

A demonstration of the Back-arc Basin Database on the WWW was made at the reception held on the evening of 11 September.

7.7 Global Digital Database - R. Detrick

The Global Digital Atlas was discussed and approved at the Steering Committee Meeting in Tokyo in September 1994. One of the major contributors to the Atlas is the on-going RIDGE multi-beam data synthesis project.

The RIDGE multi-beam data synthesis project is a three year project which began in 1993 and whose funding terminates in June 1996. One of the objectives of this project was to move beyond the traditional paper atlas to an on-line database that is accessible on the Internet and to produce CD Roms both of which make the data more accessible and more useful to the community. The original scope of the project encompassed data from the Northeast Pacific, the EPR and MAR. Substantial progress has been made in all of those areas. The Northeast Pacific synthesis is completed and the data are available on CD Rom through the National Geophysical Data Center (NGDC) in Colorado. The EPR data are on-line and consist principally of the ODP data synthesis. Most of the US data collected on the MAR are currently on-line.

It has been a very successful project to date with approximately 10,000 logins per month via the WWW. It is widely accessed not only by our community but also by the general public. There are many different levels of data resolution available, all of which can be independently password-protected. Individual passwords can be controlled by PIs allowing a great deal of flexibility in terms of proprietorial protection. It could serve as a model for various InterRidge on-line databases.

From the beginning of the project there was the intent to incorporate as much non-US data as possible. Discussion at the Tokyo meeting added to the impetus to expand the RIDGE synthesis with the idea that it would provide a major component of the InterRidge Global Digital Atlas. Following that meeting steps were taken to expand the input of non-US data particularly for the EPR and MAR which are the focus for years 2 and 3 of the RIDGE project.

InterRidge National Correspondents were made aware of the InterRidge International Global Digital Atlas effort and the existence of the subcommittee established to oversee it. Their co-operation was encouraged. Contacts were made with the UK, Italy, Russia with some success and their data has been incorporated into the database. France was also encouraged to contribute its data which includes valuable data collected in the Atlantic. D. Needham was in contact with W. Ryan and an IFREMER engineer working with him visited Lamont, W. Ryan proposed possible exchange protocols and offered to help set up a data base at IFREMER. There is still no French data in the synthesis and this has caused some frustration in the US. A few weeks ago the discovery was made of a systematic login from several addresses in France to download all available data as well as attempts to hack into login-protected data files. This has led to blocking French access to the data in the Lamont bank until the situation can be resolved.

Discussion and Comments

On-line data bases are becoming more prevalent and important and will require international good will and adoption of appropriate policies by the various nations to avoid the contribution of any one nation being unfairly exploited.

The identity of the person or people responsible for systematically downloading the data and attacking the logic-protected file is unknown to the French Steering Committee Members and inquiries will be needed to clarify the situation.

There is an interest in the French community in developing a database and contact was made by IFREMER with the Lamont group to discuss solutions to technical difficulties. Possible procedures for data exchange were proposed by Lamont. There is no ambiguity about the eventual contribution of French data although no calendar or schedule for the exchange has been agreed upon. Further discussion is required.

An internal policy has been established to insure that French data is available in France within a reasonable time but policy concerning distribution of French data outside of France is not clear. In addition, there is some question about contributing to the RIDGE synthesis which is perceived as a purely US product and not an InterRidge product. A statement addressed to IFREMER endorsing the RIDGE synthesis as an InterRidge project might be useful.

This question of the place of the US RIDGE project within the InterRidge project was raised by several members of the Committee (see 7.8 below)

ACTION:

R. Searle was asked to write to the president of IFREMER (with a copy to the Comité Dorsales) requesting that the ban on exportation of multi-beam data be lifted so that the French investigators can participate on equal footing within the international community. (D. Needham expressed reservation about that approach, pointing out that, although the situation was not clear, he didn't know of any formal written ban covering multi-beam data in general.)

RIDGE will make a request to Dorsales for French multi-beam data.

These letters would include a restatement of the original InterRidge project design which included database archives in multiple centers in various countries. Citation policy should be stressed in order to encourage contribution.

The InterRidge Global Digital Atlas Committee is charged with developing a citation protocol. There should be some clear policy for time limits for investigators from InterRidge nations to contribute their data to their national database.

7.8 Global Digital Atlas Committee Report - K. Tamaki

The Committee was charged with making an assessment of the level of commitment in each country to organising a system of database management. A letter was circulated to the National Correspondents and responses were received from France, the UK and the US, but little other action has been taken.

The committee was unaware that the RIDGE multi-beam synthesis was intended as an international effort and it welcomes this knowledge and the work done by the Lamont group. Maintaining and managing a database is very hard work. Some, but not all, countries will have the staff and funding to maintain their own. The availability of an international database to which countries that cannot support their own can contribute is a very practical solution.

Password technology is very useful since it means that immediately after a cruise tracklines can be made available to the community and the resolution of accessible data can be increased step by step. This will allow submission of data to the database before publication without raising proprietary issues.

A discussion of the rule governing data submission is required specifically as pertains to citation of contributors. The current databases at Lamont and the NGDC are anonymous. This may require some development if investigators are to be encouraged to freely contribute their data.

Discussion and Comments

With the password protection the investigators at the University of Washington are carrying out all their research and data manipulation on the WWW.

At last year's Steering Committee Meeting in Tokyo, the understanding was that the RIDGE multi-beam synthesis would be a limited database and that each country would take responsibility for its own data or for limited geographic areas. For example, since the RIDGE project only covers the Northeast Pacific, the EPR and the MAR, it was thought that other countries might take responsibility for areas like the Indian Ocean or the Arctic using the software that has been developed and made freely available by the Lamont group. It was generally thought that the idea of geographically defined databases makes more sense than duplicating efforts for the same areas in each country. It was noted that sites can be developed and maintained by one country and mirrored by others to enhance accessibility.

A proposal has been submitted by the Lamont group to renew the funding and extend the US project. This would include maintenance and updating but probably not geographic expansion apart from perhaps the Indian Ocean. It was noted that in this case most of the MOR system would be covered by the Lamont group.

The RIDGE data base is a contribution to an international, freely-available InterRidge Global database. Initiative from other countries would be welcome and could be channelled through the InterRidge Global Digital Atlas Committee.

7.9 Biological Studies Ad Hoc Committee - D. Desbruyères

The Biological *Ad Hoc* Committee held its first workshop at Rutgers University on 24 & 25 April 1995. The 25 participants included the members of the *Ad Hoc* Committee and various members of the ridge crest biologist community (15 +1 USA, 4 France, 2 Portugal, 2 UK, 1 Canada, + InterRidge Co-Ordinator). There were no German or Spanish participants. L. Mullineaux will be joining the committee from the US.

The objectives of the workshop were:

- To develop an implementation plan for integration of biological studies into the 3 principal InterRidge themes.
- To draft a formal international agreement to be endorsed by InterRidge to provide for exchange of data and samples.
- To develop approaches and methods to maximise the effectiveness of biological sampling and observations during "geological" cruises.

It is the opinion of the Biological *Ad Hoc* Committee that biological studies do not fall naturally within the framework of InterRidge. The scales on which the three principal themes operate are not those used by biologists. This may be the reason for the very limited participation of biologist in InterRidge workshops. However, Active Processes is the most natural theme for biological studies to fit into.

A Basic Framework for Biological Studies at the Ridge Crest

1 Origin and Evolution of Vent Taxa

- Paleo tectonics
- Paleo-oceanography (need input from geosciences)
- Evolution
- Genetics
- Biogeography

2 Community Structure and Species Persistence (Community Dynamics)

- Cold sulfide deposits
- Temporal variation
- Monitoring (observatories link)
- Ridge fauna
- Dispersal and Reproduction
- Lifecycle
- Symbionts transmission
- Adaptation to extreme conditions

Hydrothermal vents are an unstable environment. Biological communities must persist within a segment and then disperse in lifecycles which help them to survive. Cold sulfide deposits are not being studied at present but may be the most important aspect of hydrothermal venting in terms of volume and their associated biological communities.

3 Biogeochemical Interaction

- Biological modification of vent fluid chemistry
- Biomineralisation
- Subsurface circulation system plumbing

These are fundamental processes occurring at hydrothermal vents, yet there is currently little or no work going on in these areas.

4 Biological Production

- Chemosynthetic production
- Symbiosis
- Ultrathermophily (limits of life)
- Exploration of OM from vents to ridge
- Cold biological production (psychophilic chemosynthetic production)

All of this is currently under discussion over the Internet and an implementation plan is being formulated which will eventually be ready for discussion at the Steering Committee level.

International Sample Exchange Agreement and 'Bio-box'

The bio-box is an American concept. It is a box containing all the supplies and information necessary for non-biologists to effectively and correctly sample and preserve hydrothermal vent biota. Optimally, all vessels carrying a bio-box would be in communication with a biologist.

The International Sample Exchange Agreement pertains to preserved and frozen samples. Its aim is to avoid duplication of sampling which is costly not only in monetary terms but also in terms of environmental impact. The Biological *Ad Hoc* Committee will request ratification of the Agreement which will have been endorsed by all the member nations of InterRidge. The Agreement excludes commercial use of any exchanged sample. Each nation will have a curatory clearing house kept by a national corresponding curator whose responsibility it will be to:

- keep a record of all samples collected by PIs from his or her country;
- respond to sample requests;
- keep a record of all exchanged samples; and
- curate bio-box samples.

Limitations of the Agreement will include:

- non-commercial use of samples;
- investigators must supply reports on work carried out;
- the life of the study must be agreed upon before exchange;
- citation must be agreed upon before exchange; and
- samples may never be redistributed by the requester.

Ridge Crest Biologist Directory

This directory is currently under development on the WWW.

Data Exchange - BioOcean-H

BioOcean-H is currently used as a format for data exchange in France for deep sea research data but not for hydrothermal vent fauna. This database is being extended as a project of the Biological *Ad Hoc* Committee to include vent fauna so that data may be exchanged on the WWW.

International Vent Biology Symposium

An international symposium is being planned by M. Biscuito (Portugal) and C. Cary (US) to be held in Madeira in the Spring of 1997. The proceedings will be published in a volume edited by D. Dixon (UK).

Species Identification Manual

A manual is currently being compiled which will be distributed to all cruises working at the ridge crest so that biological samples that arrive on deck can be identified and described by geologists in a way which can be understood by biologists. Contributions of manual pages are being made by numerous individuals within the community.

Demarcation of Sanctuaries and Definition of Collection Areas

Areas of particular interest, areas where instruments are deployed and areas where monitoring is on-going will be designated and the community will be informed and requested to respect them. An effort will be made to co-ordinate sampling.

International Listing of Sea-going Capabilities

A listing has been compiled by the InterRidge Office and is accessible via the WWW. Work will continue on the listing to expand and update it.

Discussion and Comments

There is a need for a clearer understanding of the biology among geologists but, given the complexity of vent biology, developing such an understanding seems somewhat overwhelming. Perhaps as a first step, a broad overview could be presented to the geoscience community.

Currently in France, Japan and the US, the focus of microbiology is on the biotechnical exploitation and not on the role of the microbiology within the natural system. The Biological *Ad Hoc* Committee feel that attention should be redirected back towards exploration of the natural system at vent sites.

Much of the biological investigation is done at the submersible dive scale which is also the principal scale for investigation of active processes. Biological Studies should be able to fit into the Active Processes theme. Yet, the *Ad Hoc* Committee feel this to be a difficult process.

The biologists have a lot of well defined questions to ask of the geologists and geochemists. They recognise that the answers to these questions will advance their work. But the geologists are simply not interested in the biology let alone trying to frame questions which would allow them to interact with the biologists. It is not a two way exchange. This has created a gap between the two communities which must be bridged.

The InterRidge Program Plan was largely written by geoscientists several years ago. Interest in vent biology has grown rapidly in the past few years since the document was drawn up. Geoscientists are now in a position where a much more direct input from biologists would be more valuable in any science plan. It was proposed that rethinking the InterRidge Program Plan to integrate the biology may be appropriate at this point in time and in the development of InterRidge. However, the biologists are reluctant to rewrite the Program Plan. It would be preferable for InterRidge to undertake a few clear, well-defined actions on behalf of the biological community and make a commitment to carry them through.

A large part of the gap between the two communities has resulted from the inability of the geosciences community to pursue work which would link them to the biologists. This has largely been due to technical limitations on sampling capabilities rather than a lack of interest in the questions common to geosciences and biology. As these limitations are removed by continued technical development, we can anticipate more collaboration and an increased interest and interaction on the part of the geoscientists.

Discussion must continue and communication between the geoscience and biology communities must be encouraged and actively developed. On the whole, the interaction between two fields within such programs as InterRidge will be of benefit to both by bringing new ideas and opportunities within their individual scopes.

ENDORSEMENT:

The InterRidge Steering Committee endorses all of the recommendations and actions presented by the Biological *Ad Hoc* Committee. The Biological *Ad Hoc* Committee will be maintained as such for the present and will be considered for upgrading to Working Group status if appropriate in the future.

ACTION:

The InterRidge Office will publish the Species Identification Manual. Included within it must be information on what critical measurements must be made when biological samples are taken.

7.10 Project Management

The SWIR Project is an example of project management which has worked very well for Global Studies and may be a model for some of the Meso-scale projects. As the focus of InterRidge is increasingly on the Phase 2 projects, the three principal Working Groups may have outlived their usefulness and it may be advisable to move to a committee structure for those projects that are ready to be launched.

Two models were proposed for working group structure: -

In the first, the three working groups are maintained and changes required to insure that their constitution includes members of the various projects.

In the second, overseeing of the projects would rest with members of the Steering Committee and actions would be carried out by committees specific to the individual projects. These committees could be small working groups whose longevity would be determined by the length of the project. The drawback here would be the isolation of those working on the various projects which might result in duplication of effort. This could be overcome by cross-membership and joint meetings.

The second option was decided on and the following project groups were identified:

<u>Theme/Working Group</u>	<u>Steering Committee Raporteur</u>
Global Studies	
*SWIR	C. Langmuir
+Arctic Ridges	R. Rihm
*Global Digital Database (including BAB)	K. Tamaki
Meso-Scale Studies	
*4-D Architecture	L. Parson
*Quantification of Fluxes	K. Von Damm
Active Processes	
+Event Detection and Response	J. Cann
*Biology	L. Mullineaux
*Established project	
+Emerging project	

Discussion and Comments

After some discussion of the validity of Back-arc Basins as a separate project, it was decided that the processes occurring in back-arc basins are characteristic enough to warrant the existence of a project working group. K. Tamaki is committed to stepping up work on this project partly by integrating data from his upcoming cruise and that collected by the Hildebrand cruise into the BAB database. This will make the back-arc basin project much more viable and visible.

A goal for the Back-Arc Basin Project would be to build a framework for a drilling project out of the existing data and surveys planned for the near future, aimed at testing some of the hypotheses and questions that have been identified by the Meso-Scale and Active Processes Workshops. It's a marvellous opportunity for InterRidge to create a drilling proposal that is international in nature with a lead component from many of the ODP countries as well as being an InterRidge initiative.

SUMMARY AND ACTIONS:

In summary, the three major working groups will be dissolved and project working groups will be drawn up for each of the 5 established projects which are in, or very rapidly approaching, a detailed planning or execution stage and the 3 emerging projects. The rapporteurs will be responsible for overseeing the project working groups and reporting back to the Steering Committee. Those rapporteurs who are not on the Steering Committee will be introduced as *ad hoc* members. Each of the rapporteurs will be asked to constitute a small group of people to forward these projects. The projects will be grouped under the existing three principal InterRidge Program themes.

8.0 Interaction with Other Organisations and Programs

8.1 SCOR Affiliation Status

N. MaCave, SCOR President, has initiated a discussion on SCOR affiliation for InterRidge and E. Gross, SCOR Executive Director, has sent the text outlining some of the possibilities of affiliation status. SCOR is initiating a new mechanism for a new type of involvement of other programs which they call SCOR-affiliated. SCOR's role in relation to an affiliated program will be one of advice and occasional review and SCOR would wish to be involved in membership decisions. Its international contacts could be used, amongst other things, to entrain countries into projects, and to assist in involving participants from developing countries by using SCOR/NSF funds as seed money.

The ground rules for affiliation status are not yet firmly defined and SCOR would like to have input on how InterRidge might like to see them established.

Discussion and Comments

The above outline is what InterRidge wanted from SCOR when it first approached it several years ago at which time SCOR had no mechanism for affiliation and no clear idea of InterRidge's credentials as an international organisation. The intervening years and formal link through Working Group 99 have served to build SCOR's confidence in InterRidge. The proposal and operating procedures of SCOR are very close to the structure of InterRidge. This affiliation with SCOR would be a very good thing.

ACTION:

Clarification of involvement with membership decisions and status of national membership within the framework of the InterRidge subscription structure would be required before InterRidge could take a decision on SCOR affiliation.

8.2 SCOR Working Group 99 - M. Sinha

This working group was formed early on in the history of InterRidge as a means of forming a formal link between InterRidge and SCOR to lend some structure and weight to the InterRidge Initiative by placing it with relation to the International Council of Scientific Unions (ICSU). The result is the SCOR Working Group 99: Linked Mass and Energy Fluxes at Ridge Crests (WG99). WG99 was set up at the end of 1993 with the brief of examining the scientific problem, making reports, encouraging international collaboration in research on that particular area and organising and hosting symposia at which the state of the art science in that area is presented and discussed. WG99 was set up partly as a normal SCOR working group but also with the idea that it would provide a direct link between InterRidge and SCOR. The existence of InterRidge has put WG99 in a singular position: as a small working group it doesn't want to take over the role of InterRidge as a body constituted by the active scientists in the field but it obviously has some contribution to make and must report to SCOR and meet SCOR's requirements.

Working Group 99 consists of:

M. Sinha (Chair)	UK
C. Langmuir	US
D. Needham	France
K. Juniper	Canada
N. Holms	Sweden
A. Schrieder	Russia
H. Fujimoto	Japan
H. Bougault	France
J. Delaney	US
P. Einerssen	Iceland

This list was agreed jointly by SCOR and InterRidge. The terms of reference for the working group states that its function is to:

- identify the particular areas that require international attention and co-ordination for their advancement
- make a report on what those areas of science are
- promote active co-operation and advance in those areas of science

- hold a SCOR symposium to present the up to date scientific findings
- produce a volume of these findings as a final SCOR document

It is envisaged that WG99 will have a lifetime of 3-4 years.

After preliminary discussion the working group met in Cambridge in October 1994. One of the conclusions of that was to try to direct the excitement felt by the scientist involved in mid-ocean ridge research outward towards both the scientific community and the international and national policy makers. For that reason it was felt important to emphasise the links between ridge processes and the global environment in any report of the working group.

This first meeting led to two things. The first is the interim report which was submitted to SCOR Executive Meeting and attempts to outline a résumé of the current state of ridge science. The second was to set the background for the working group to meet its target of setting up a symposium and producing a written volume on the outcome of that symposium. There were two ideas on how to go about that: to set up a science meeting on linked mass and energy fluxes or to organise a symposium aimed outwards at a wider audience not directly involved with the science. After consultation with SCOR it was decided that the second would be the best to adopt and that as a SCOR body it could bring the information to people who don't ordinarily go to ridge crest research related workshops and meetings.

This symposium will be held at the next General Assembly of SCOR in Southampton, UK in September 1996. A range of speakers will be invited who reflect the work being done in every aspect of fluxes at the MOR and there will also be room for contributed presentations. Since it will be a SCOR General Assembly it will be attended by a wide range of people from the various funding agencies and governmental bodies as well as scientists working in the non-ridge areas.

As part of the preparation for the symposium we plan to produce a booklet, largely modelled on one produced by the European Union on grand challenges in deep sea oceanography which made no mention of mid-ocean ridges. The booklet is planned to be about 30 pages long with lots of color figures aimed at non-ridge scientists to explain why InterRidge exists and what it's doing. It will be produced as a joint SCOR/InterRidge project. SCOR has provided the working group with a budget to cover at least part of the cost of production and SCOR will assist in its distribution to relevant people and bodies.

The next task of the working group before the end of the year will be to produce a draft of the booklet and to use SCOR mechanisms to publicise the upcoming symposium for which we will be finding keynote speakers. Following the symposium a volume will be published and the working group will be dissolved.

ENDORSEMENT:

The Steering Committee endorses the actions and plans of the SCOR Working Group 99.

8.3 *Ocean Drilling Program - J. Fox*

For the first time ODP has a genuine interest in forming strong ties with such intellectual initiatives as InterRidge which exist in the community and have identified scientific questions that they want to address. Some of these questions can only be answered through facilities offered by ODP. There is still some concern on the part of some members of the Planning Committee that these various initiatives might cannibalise the ODP Program, however, the opportunities are very much present. InterRidge, more so than any other initiative, is well placed because it is truly the most international.

In view of the existence of this opportunity, how can InterRidge reap the maximum benefit? First, through the InterRidge liaison on the ODP Planning Committee, Catherine Mével, and second, at the thematic panel level. The two panels which most concern InterRidge are the Lithosphere and Tectonics Panels. It would be good to become more closely involved with those panels through establishing liaisons. The third way is through input to the ODP Long Range Plan (LRP). R. Searle has been asked to comment on behalf of InterRidge on the draft and this period of dialogue could be used to establish how formal links can be initiated or maintained in the future.

If ODP is renewed for the 1998-2003 time frame, we will see a change in the way in which the Drilling Program operates specifically with respect to Lithosphere and Tectonic objectives. There's likely to be more commitment to a scientific problem that goes beyond a given leg. The drill ship capabilities will be used over more than one leg to solve problems and answer questions. This may mean drilling a much deeper hole or drilling a series of holes.

Related to this is the realisation that, in the past, there has occasionally been a misfit between the ODP and the scientific questions that have been posed. This has often been due to the inability of existing technology to answer the question or lack of resources committed to pre- or post-site investigations. Programs like InterRidge provide the opportunity to bring to bear resources beyond those traditionally available within the ODP community to carry out site surveys both before and after the drilling program. InterRidge is urged to think along those lines.

Another way in which InterRidge can influence ODP is through engineering development. In the coming years we will see a constant dialogue going on within the Planning Committee structure on how to allocate those resources that are available. InterRidge can identify things like the diamond drilling system and the hammer casing facility which will allow drilling in hostile rocky terrain. These systems could benefit InterRidge objectives in that they could allow us to recover more samples or penetrate deeper into the crust at the ridge crest. This can be pointed out in dialogue concerning the LRP to help steer the decisions.

In terms of the ODP calendar and how InterRidge may be able to affect it, the 1996 calendar is set. The JOIDES Resolution will be drilling on the Juan de Fuca sedimented ridge objectives at the end of the year to examine chemical alteration in the crust and change in its physical properties as a result of hydrothermal circulation. More importantly, in 1997, looking at the proposals which are already in the system and highly ranked, the drill ship is likely to move to the South Atlantic and then into the Indian Ocean. It will likely be at SWIR in the latter part of 1997. That will be very compatible with the InterRidge SWIR Project Plan.

Historically, drilling has been viewed as the end of a phase of exploration, but it can also be seen as one part of a larger investigation, and returning to SWIR may prompt introduction of a submersible or an ROV into that area to find the distribution of rock types in three dimensions by working along escarpments and by looking at the aseismic trail of intersections. The SWIR working group should begin to think of scientific objectives that can be accomplished using the drill ship in order to capitalise on the return to the SWIR.

The latter part of 1998 will see the drill ship close to a number of back-arc basins which represents an important opportunity for work there.

JOIDES is trying to find new partners to bring into the consortium. Taiwan is about to sign to become a partial member, augmenting the Canadian-Australian membership. The Peoples Republic of China, New Zealand and Brazil have also expressed interest in becoming part of the program. The total membership may grow which creates greater resources but also greater challenges of program management.

Discussion and Comments

R. Rihm is an InterRidge liaison to the Lithosphere Panel as is D. Castillo. J. Lin will be invited to serve as liaison to the Tectonic Panel.

It may be possible for InterRidge to submit a proposal to ODP as an organisation. This question should be addressed in discussion over the LRP. If this is a possibility, a proposal for Back-arc Basin drilling should be submitted within the next year and a more generic proposal for 4-D Architecture should be submitted soon after. A SWIR proposal, submitted by H. Dick and J. Natland, already exists in the ODP system. A letter of support could be introduced into the discussion at the Lithosphere Panel this Fall by R. Rihm to promote this proposal as an InterRidge endorsed effort.

Drilling in the Red Sea is not viable due to the non-negotiable political situation with the Saudis.

ACTION:

J. Fox will provide R. Searle with a summary of engineering and scientific achievement for background in LRP review discussions. R. Detrick has provided a summary on crustal drilling legs and the contribution that it has made to the advancement of the science. A hydrothermal drill contribution would be useful. K. Von Damm was asked to contribute a summary.

8.3 FARA/InterRidge Symposium - C. Langmuir and D. Needham

One of the commitments of the FARA Program is to hold a symposium at the end of the program term in 1996 to present the results. It was thought a good idea to extend the scope of the symposium to include result obtained not only by France and the US but the various other nations

working in this area of the Atlantic as well. Various National Correspondents have been contacted as well as scientific agencies in France and the US. General agreement and endorsement was received and it was decided to hold the symposium in Iceland on 17-21 June 1996. Official agreement from Iceland is still pending but contact has been made with a liaison and problems are not anticipated. Some delay in planning was incurred due to discussion about co-ordinating the dates of the symposium to coincide with two other meetings to be held in Iceland in 1996. In the end, it was decided that the FARA/InterRidge Symposium would not be coupled with either of the other meetings.

The first announcement went out over the e-maillist through the InterRidge Office on 8 September. It was a request for those interested in the Symposium to include their name on an electronic maillist through which they will receive further information. There is no mention of how to apply or the actual agenda. It does mention the intention to hold a short field trip either before or after the symposium and to publish the results in a Ewing Symposium Volume. We are now waiting to learn what response there will be. Originally we had anticipated about 100 people but it looks as though there may be many more than that. Still to be worked out are such details as how to select and invite speakers, a mechanism for contributions to the volume, venue and accommodation possibilities. Funding for attendance will be the responsibility of each of the individual nations.

Discussion and Comments

The Steering Committee is excited by the prospect of the meeting and looks forward to further developments. It was suggested that in order to avoid problems due to limited accommodation in Reykjavik the meeting be held in Húsavik.

ACTION:

National programs will be informed of the list of invited speakers and the expected number of attendants as well as any limitations to be placed on the number of participants. The earlier this is done the better in terms of funding and planning of individuals' schedules.

9.0 InterRidge Budget

The Steering Committee received the financial report from the Co-Ordinator. The report documented receipts and expenditure for December 1993, calendar year 1994, to date 1995, anticipated 1995, and projected 1996. Actual expenditure in 1994 was less than anticipated but so was the amount received so that we began the 1995 budget with a deficit. In 1995, with the addition of Spain's subscription and the UK host country contribution to the 1995 budget, it is anticipated this deficit will be reduced.

At the time of the meeting, three 1995 contributions remain outstanding: 1 Principal, France and 2 Associate, Germany and Portugal. The French and Germany invoices were issued in June, several months later than the others, to allow time to make clear their membership status. In France, Dorsales has endorsed and recommended 1995 and 1996 Principal Membership in InterRidge but the decision rests with the *Commission Directeur*. In Germany, the invoice has been submitted to the appropriate administrators.

The Steering Committee recognised the effort made by J. Francheteau in obtaining recommendation for Principal Membership for France.

9.1 Invoicing Procedure and Currency

Invoices in US dollars are posted against the InterRidge account in sterling by converting the amount at a set rate of exchange. When payment is received on the invoice, however, the amount is converted at the current exchange rate for that day. This results in the need to make amendments to the account with each incoming payment which requires a lot of internal administration. In addition, the double exchange from the currency of the member nation to dollars and then to sterling may cause administrative problems for the member nation and result in further exchange costs. The Co-Ordinator proposed that where possible, invoices be issued in the currency of the host country at the equivalent of US\$ 20,000 on the day of issue. A statement of exchange rate will be included on the invoice.

ACTION:

The InterRidge Office will consult with the member nations to find the best solution for the country in question.

9.2 Funding for Workshop Participants

The amount of lead time required for non-US participants to find travel support is much longer than the time allowed when arranging small working group meetings. Therefore, it might be appropriate for a small amount of the InterRidge budget to be set aside to cover travel expenses for a small number of participants.

The Steering Committee authorises the InterRidge Office to take what ever cost cutting measures it sees fit so that there is additional money in the budget to further the progress of InterRidge. This could take the form of small contributions to support travel to InterRidge meetings.

10.0 InterRidge Office Transfer

The InterRidge Office is scheduled to move again at the end of 1996. In view of the limited time available, this is the moment to discuss the calendar and procedure for the call for bids and selection.

ACTION:

A formal call for bids will go out in January 1996 with replies coming back in March. A decision will be made by mid-Summer. The endorsement will be made by the Steering Committee Members by e-mail.

R. Searle will prepare a draft call for bids to be circulated to the Steering Committee Members. The call should include mention of the host country contribution, suitable space, cost of Office transfer and a proposed Chair. It should also be stipulated that the Co-Ordinator's salary should be sufficient to assure provision of the same level of service provided by the current Office. Depending on the host country, an increase in the level of the subscription fee might be necessary to support this. The host country should define the co-ordinator's salary on the basis of the level of service and budget for their salary accordingly.

11.0 InterRidge representation

It was established earlier in the agenda to dissolve the existing working groups and set up a project based committee structure. It may also be appropriate to consider rotations for Steering Committee Members and review the National Correspondents and liaisons to other organisations.

11.1 Working Groups

Constitution of the new working groups will be left to the discretion of the leader/rapporteurs listed above. Confirmation of provisional membership will be confirmed by the Steering Committee and the National Correspondents via e-mail before they are invited.

11.2 Steering Committee

B. Detrick will be rotating off to be replaced by K. Von Damm.

L. Parson and L. Mullineaux will be invited to join the Steering Committee as *ad hoc* members.

Since many 4 year Steering Committee Member terms will end in 1996, those Members are ask to attend the next meeting and to suggest replacements at that time.

11.3 National Correspondents

E. Bonatti will be replaced as National Correspondent for Italy. He will be requested to nominate a replacement.

J.J. Dañobeitia will contact the InterRidge Office with a suggestion for a new National Correspondent for Mexico.

L. Dmitriev will be thanked for his term as Russia National Correspondent and A. Sobolov and S. Krasnov will be invited to serve.

J. Acosta will be thanked for his service as Spanish National Correspondent.

N. Holms will be asked if he is still interested in continuing as National Correspondent and if not whether he would suggest a replacement. He will be invited to join the Biological Studies *Ad Hoc* Committee and to report on what activity is going on in Sweden.

R. Rihm will suggest a contact in Denmark and an invitation to name a National Correspondent will be sent.

R. Searle will contact J. Cann to ask whether he is still interested in continuing as National Correspondent. It was suggested that if a replacement is needed, a biologist would be appropriate.

K. Von Damm will be the new US National Correspondent.

E. Vera will be invited to serve as National Correspondent for Chile. J.J. Dañoibeitia will send his address to the InterRidge Office.

11.4 Liaisons with Other Organisations

R. Searle will write to J. Mutter to ask what the status of ILP is.

12.0 Provisional Calendar

Mid-Ocean Ridges: Dynamics and Processes of the Creation of Crust
Royal Society London, 6 & 7 March 1996

Goldschmidt Conference
Heidelberg, Germany, 31 March - 4 April 1996

EGS: Mid-Ocean Ridge Processes
The Hague, The Netherlands, 6-10 May 1996

JOIDES/InterRidge/IAVCEI Conference:
Ocean Lithosphere & Scientific Drilling into the 21st Century
Woods Hole, MA, USA; 26-28 May 1996

InterRidge/FARA Symposium
Iceland, 19-22 June 1996

InterRidge Steering Committee Meeting
17 & 18 September, 1996

SCOR General Assembly
Southampton, UK, 16-19 September 1996

Geology and Geophysics of the Indian Ocean
Goa, India, 21-24 October 1996

International Symposium on Hydrothermal Vent Biology
Madeira, Portugal, Spring 1997

R. Detrick will represent the Steering Committee at the JOIDES/InterRidge/IAVCEI Conference: Ocean Lithosphere & Scientific Drilling into the 21st Century.

A conflict in dates of the Iceland meeting and the TAG post-cruise meeting may exist. The InterRidge Office will contact C. German and R. Detrick will contact S. Humphris to see if dates can be suitably arranged so as not to exclude participation in both.

The InterRidge Office will reply to the invitation to attend the Goa Meeting and K. Tamaki will represent InterRidge.

The Steering Committee Meeting will be held in either Portugal or Paris depending on the response of the Portuguese.

Appendix A:

**InterRidge / DeRidge Science Day
Agenda**

InterRidge / DeRidge Science Day
13 September 1995
GEOMAR

- 9:15 Hans-Ulrich Schmincke, GEOMAR - Welcome and short DeRidge history
9:20 Roger Searle, Univ. of Durham, UK - Scientific objectives of InterRidge
9:40 Charlie Langmuir, LDEO, USA - Global mid-ocean ridge studies

10:00 Coffee break

- 10:20 H.-J. Wallrabe-Adams, GEOMAR - North Atlantic and Arctic ridge studies
10:40 Robert Detrick, WHOI, USA - Meso-scale studies project
11:00 Daniel Desbruyères, IFREMER, France - Biological studies at mid-ocean ridges
11:20 Mark van Greven / Peter Halbach, TU Berlin - Studies of ridges in the Indian Ocean

Lunch

- 14:00 Golam Ali Dehghani, Univ. of Hamburg - Ridge research projects at the East Pacific Rise
14:20 Peter Herzig, TU Bergakademie Freiberg - Ridge processes in back-arc basins
14:30 Roland Rihm, GEOMAR - Early evolution of a mid-ocean ridge: the Red Sea
15:00 Norbert Kaul / Heiner Villinger, Univ. of Bremen - Heat flow measurements in Germany and latest heat flow results from the Cascadia Basin

15:20 Coffee break

15:40 Discussion