

SOUTHERN OCEAN PANEL
Executive Summary.

Columbus, Ohio, 8-9 October 1987.

1. Ciesielski and Kristoffersen reported on Leg 114. SOP judged important:

1.1 Leg 114 are to be congratulated on an excellent achievement under great difficulties. Drill ship's capabilities in adverse weather amply demonstrated.

1.2 10-foot scope of wireline heave compensator inadequate in rough weather, degrading vertical resolution of logs, particularly important for Milankovich signals. TAMU and/or LDGO to note.

1.3 Drill ship now carries 1 less roughneck than on 114. Conditions on rig floor during 119 and 120 will be as bad as 113 and 114, and a replacement is highly desirable, if only temporarily. TAMU to note.

2. Wise (co-chief designate, 120) reported on preparations for 119, 120, in absence of TAMU rep. Both legs appear well-staffed, sites were all PPSP-approved except for deeper part of SKP-3 and a short section of Prydz Bay Line 21. Post-cruise collaboration proposed between 119 and 120 is to be applauded. Air or shipboard ice reconnaissance of Prydz Bay is highly desirable: TAMU to contact NSF/DPP and Australians (Quilty?) again.

3. New Panel Structure. SOP considered:

3.1 New structure is an improvement in many ways but, if regional panels are denied comment or influence on the science of proposals,

3.2 standard and number of proposals reaching thematic panels will decline

3.3 PCOM and thematic panel workload will nonetheless increase, which is undesirable

3.4 regional panel members will decline to serve

3.5 relict regional panel duties overlap SSP.

SOP felt proponents need more help than new system will be able to give; SOP has acted as nursemaid, friend, safety-net etc. Regional panels should see rejected proposals also, and continue this role.

4. SOP's plans for this meeting, to produce S Pacific "Prospectus", upset by changing remit. After discussion, SOP decided most fruitful course was to review all aspects of existing South Pacific proposals in the system, plus S Pacific Workshop "ideas" proposals, as planned, with view to advising proponents on revisions recommended for initial thematic review under new system. Proponents will thus be given chance of revision before next thematic panel meetings (?March SOHP and LithP; June TECP?). To aid review, thematic panel reps outlined current panel priorities. Reviewed were

73/C Adelie Coast (Wannesson et al)

230/C Wilkes Land margin (Eittreim et al)
(combine these 2 with "coldspot" and Ceduna Plateau proposals suggested, as previously)

169/C South Tasman Rise (Hinz and Dostmann)

129/C rev Bounty Trough (Davy)

244/C rev Ross Sea (Cooper et al)

8/E Chile Triple Junction (Cande)

153/E Southeast Pacific (Hays)

209/C Eltanin FZ (Dunn)

and proposals or groups of proposals from the S Pacific Workshop Report, from which Antarctic Peninsula margin, Bransfield Strait and N-S EPR transect proposals were thought particularly interesting. The last in particular needs urgent development effort.

5. Membership Rotation. Kennett, Ciesielski and Elliot are all due to rotate off. SOP voted thanks to all for considerable contributions, particularly Jim Kennett as first SOP chairman. Decided strong thematic replacements are desirable, suggested Corliss or Hodell, Barron or Lazarus, Domack or Krissek respectively, but wished to delay invitations until remit of SOP became clear.

6. Next meeting proposed Norway, on invitation Yngve Kristoffersen. As soon as possible after Legs 119 and 120, and after next thematic panel meetings (May 1988?).

P F Barker
Chairman, SOP. 21 October 1987.

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SOUTHERN OCEAN PANEL

Draft Minutes of 8-9 October 1987 meeting, Columbus, Ohio

Participants:

P. Barker (Chair), S. Cande, P. Ciesielski, A. Cooper, I. Dalziel (TecP 9th), D. DeMaster, D. Elliot, M. Fisk, D. Futterer, J. Kennett, Y. Kristoffersen, R. McDuff (PCOM), P. Meyers (SOHP 9th), J. Mutter (LithP), J. Wannesson, S. Wise.

Apologies for absence from B. Bornhold, K. Hinz (TecP), K. Kaminuma.

1. The Minutes of the last meeting (2-3 April at Woods Hole) were approved.

2. Matters Arising

(2.2) P. Ciesielski noted that the BHA had not been lost at Site SA2 alt, as had been reported to the meeting.

(6) Chairman had sent the Panel's views to TEDCOM in writing, as proposed.

(7) COSOD II. Panel members who had been present gave their impressions: the approach of the 5 Working Groups had been very diverse, some being highly structured with little open discussion, (eg. 1), others (eg. 4) almost without structure. The comments of participants on the draft papers of the WG's had gone back to the WG's for incorporation into final reports. No copies of final reports had yet been seen.

There had been a division between WG's 2, 3 and 4 which wanted deep penetration at a small number of holes, and WG's 1 and 5 which wanted wide geographic coverage. The option of using a second (APC) ship had been proposed.

3. P. Ciesielski and Y. Kristoffersen (co-chiefs) reported on Leg 114. Among matters of interest and concern to SOP, in respect of future Southern Ocean legs, were:

3.1 The Leg 113 ice picket boat Maersk Master had been retained. No ice was seen but the late arrival of the refuelling tankers meant that JOIDES Resolution sailed early from Port Stanley with near-empty tanks and Maersk Master conducted 2 expeditions to sheltered water off South Georgia, taking on fuel from the tanker there and transferring it to JOIDES Resolution on site with the assistance of her dynamic positioning system. The tankers fuel had been contaminated by pumice thought to have been picked up during tank cleaning in the Caribbean.

3.2 The weather was continuously bad but the drill ship lost only 1.5 days, a remarkable improvement over the capabilities of Glomar Challenger.

3.3 Trip times were reduced by using a new wire line procedure. This should be usable at all sites where hole depth, water depth and weather conditions are not excessive.

3.4 Deep holes were difficult to drill in marginal weather conditions, and multiple holes forming a composite section would be a better approach in the Southern Ocean.

3.5 Much logging was accomplished, but in bad weather the restricted scope (10 feet) and dubious response of the wireline heave compensator had limited its value. This limitation should be drawn to TAMU's attention. **[ACTION PFB]**

MOTION The SOP congratulates the Co-chief Scientists and all involved in Leg 114 in overcoming considerable difficulties to produce such an excellent scientific return, and in proving the capability of the drill ship for Southern Ocean drilling. Proposed J. Kennett, seconded D. Elliot, passed unanimously.

MOTION SEDCO has now reduced crew numbers by 1 roughneck: this would have seriously impeded Legs 113 and 114. TAMU should ensure a replacement for Legs 119 and 120 which will experience similarly arduous conditions on the rig floor. Proposed P. Ciesielski, seconded Y. Kristoffersen, passed unanimously.

4. Recent TAMU economies meant that SOP no longer had a TAMU liaison. Woody Wise as designated co-chief scientist of Leg 120 had recently visited TAMU and could report on progress in staffing Legs 119 and 120, and related matters.

4.1 Prydz Bay. The Safety Panel has approved Leg 119 drilling all but a small section of the submitted profile, to 500 m depth, to give maximum flexibility to the shipboard party. A middle site will be drilled first.

4.2 Leg 119 has no plans to set a re-entry cone at KHP-1, which will be drilled as a single bit hole. The intention is to head south for Prydz Bay as soon as ice reconnaissance reports are favourable. SKP 6B is an alternate site to PB1-4, and SKP-8 has also had PPSP approval, as a standby site.

4.3 DPP has arranged LC-130 reconnaissance of Prydz Bay at weekly intervals, with a TAMU representative aboard. The SOP is concerned that the ice reconnaissance should be undertaken in a professional manner, and requests further details from TAMU. An experienced outside observer and a SEDCO representative may both be needed. Possibilities for shipboard recce should also be explored by TAMU, perhaps via Quilty. **[ACTION PFB: ODP are not the source of this rumour. They would like reconnaissance but it is not arranged. They are chasing DPP and Quilty: 8 Nov 1987]**

4.4 PPSP approved all 4 Leg 120 sites, but SKP-3 has been approved only to the late Eocene. Schlich has been encouraged to look for alternative sites nearby which do not show the apparent pinchouts found in the lower section.

4.5 The cruises are nearly fully staffed. The shipboard parties appeared strong and capable.

4.6 A letter from the 4 co-chiefs was being sent to all Leg 119 and 120 participants proposing joint work towards Part B of the Proceedings, and preference in non-participant post-cruise sample requests to members of the alternate leg. The Panel approved this initiative since the objectives of the 2 legs overlap significantly.

5. Panel Liaisons' Reports and discussion of the proposed new Panel Structure

[The letter from PCOM Chairman Nick Piasias was tabled describing the proposed revised role of the Regional Panels and recommending a SOP approach to submitted drilling proposals in the transition period]

5.1 PCOM (McDuff)

Exec. Summaries of previous 2 PCOM meetings were tabled.

(a) Buffler is returning to UTA, and being replaced at NSF by Malfait.

(b) Economy measures were being taken by TAMU in response to decisions by PCOM and EXCOM that \$1.25M should be set aside each year for contingent operations, such as guidebases, new pipe, ice picket boats etc. They affect shipboard staffing (techs and staff scientists) and publication in particular.

(c) Drilling in future will be more thematically driven: interim arrangement is that proposals will go initially to the thematic panels, and regional panels will consider the feasibility of thematically-approved proposals. A PCOM subcommittee is making final recommendations which should be very similar. The perceived need for a more thematic approach derives from the COSOD II Steering Committee.

5.2 SOHP (P. Meyers)

SOHP wondered why the Panel structure had to be changed now. After initial difficulties the Panels now appeared to be working well. Some members felt there was a danger that Regional Panels would be reduced to "clerk" status, or eliminated altogether.

5.3 LithP (J. Mutter)

LithP was happy with the new system, and used it in a recent joint meeting with CEPAC. PCOM wishes the drill ship to be seen as addressing the main thematic problems, rather than as a global wanderer tackling local problems.

5.4 Discussion brought out the following concerns:

(a) SOP has acted in the past rather like a thematic panel: some proposals (eg. 114) which turned out very successfully were not at first appreciated by the thematic panels and have needed support.

(b) The new system will be more "efficient" but the loss will be the help previously given to proponents on the way to review by the thematic panels. The thematic panels will find themselves reviewing a less well-formulated proposal (in the thematic as well as the practical sense). Proponents need help. Regional panels should also see rejected proposals, with a view to helping these also.

(c) If the regional panels are not allowed to contribute to the science of proposals, but only to review their feasibility (a task with considerable overlap with Site Survey Panel concerns), how many scientists will wish to serve on them?

(d) It would not be good if the re-organisation led to more work for PCOM, as it might if the filter process beneath PCOM were to be partially removed. PCOM needs to be presented with fewer and better-defined problems and decisions, rather than more and worse.

(e) SOP's opinions should be presented to PCOM within its annual report, at the next meeting (which Panel Chairmen attend).

6. Review of South Pacific Proposals - Strategy

N. Pisiyas' letter of 3rd September recognised the difficulty of undertaking the original task of this meeting, which was to provide for PCOM a Prospectus of S. Pacific drilling proposals, in view of the change of Panel duties which is in progress. All of the firm proposals that SOP had planned to review will in fact be reviewed by the thematic panels in the next six months. It was not clear, however, that the thematic panels' concern would extend to those components of the USSAC S. Pacific Workshop Report which had not been translated into firm proposals, which SOP had also intended to review. The matter was urgent, in that there was now a possibility of heading for the southeast Pacific from the eastern Australian margin, within the W Pacific drilling period.

The Panel decided that, in view of the changing style of ODP proposal review, it would be most beneficial to proponents to provide them with information which would allow them to revise their proposals if they wished, rather than only to evaluate them as they stood. Revised proposals should be resubmitted by mid-January, to catch March meetings of LithP and SOHP (TECP next meets probably in June). The three thematic panel representatives (now including Dalziel for Hinz of TECP) were first invited to outline their panels' priorities, to guide SOP evaluation.

6.1 SOHP Priorities (P. Meyers)

1. Neogene palaeo-oceanography
2. Mesozoic-Paleogene palaeo-oceanography
3. Sea-level: atolls and guyots
4. Anoxic events
5. Old Pacific history
6. Diagenesis and metallogenesis
7. Fans and sediment processes

Continental margins and glacial history would come under 1, 2 and 7, and probably 3. A N-S Pacific transect remains very important to SOHP. The list is slightly CEPACific-centric.

6.2 LithP Priorities (J. Mutter)

1. Structure of lower crust
2. Magmatic and hydrothermal processes at sediment-free ridges
3. Magmatic and hydrothermal processes at sedimented ridges
4. Young hotspot volcanic chemistry
5. Oceanic plateaux
6. Old crust
7. Mechanical response to loading
8. Young rifts
9. Segmentation of rifting
10. Temporal variability of hotspot volcanism
11. Convergent margins
12. Fracture zones

Top 6 were highlighted for CEPAC specifically: in other regions the high priorities could be different. Back-arc processes, for example, had been important for WPAC proposals.

6.3 TECP (I. Dalziel)

1. M-series dating calibration
2. Lithospheric flexure
3. Ridge-trench interaction
4. Pre-70 Ma plate motion
5. Deformation in accretionary prisms
6. Cretaceous quiet zone
7. Intraplate volcanism
8. Arc geochemistry
9. Deformation fronts
10. Young plate motions
11. Subsidence and sea level
12. Absolute subduction rates
13. Gulf of California
14. Oceanic plateaux
15. Oceanic structure

This was a CEPAC-specific list. The top 5 had majority support, the next 6 moderate support, and the remainder little support. Passive margins problems had not really been considered.

7. Review of S. Pacific Proposals

7.1 Adelie Coast (Wannesson et al. 73/C)

Aimed at (a) position of C-0 Boundary and timing of early Australian-Antarctic separation (b) early circumpolar current development and (c) Antarctic Paleogene sequence and pre-glacial climate.

Section proposed to attack deeper target (age of Quiet Zone to test Australian-Antarctic separation) too thick for success in ice-infested area: problem better attacked on the Australian margin (? Cande and Mutter). Concentrate on the uniqueness of the ice-loaded Antarctic margin and compare with Australian

conjugate, sampling the more accessible upper part of the section. Antarctic glacial history is preserved in prograded sediments near the shelf edge, although topset beds are eroded. Could be promoted as successor to Prydz Bay drilling. Combine with

7.2 Wilkes Land Margin (Eittrein et al. 230/C)

Similar targets in area to west; similar advice. Sediments even thicker, holes too long as proposed. Canyon drilling not recommended.

Previous reviews (5/86 and 10/86) had recommended combination of these 2 proposals with "cold-spot" drilling of Discordance (Langmuir) and Ceduna Plateau on conjugate Australian margin. Advice repeated. Also possible to regenerate Cande and Mutter proposal to test A34 identification on Australian margin, as part of this or separately. Could attract all 3 panels.

7.3 South Tasman Rise (Hinz and Dostmann 169/C)

Stated objectives (Australian-Antarctic break-up, age and nature of uplift/erosion, and pre-Oligocene seismic unconformities) not obviously addressed by drilling. Why 3 holes not 1? Also all holes are very long. Suggestion that transpressive tectonic regime is worth investigating may interest TECP, but not clear how best to do so. An unmentioned strength of the proposal is that this region was a crucial gateway between Indian and Pacific oceans in the Paleogene, and the graben could be worth drilling for the palaeo-environmental record. Interest is TECP and SOHP.

7.4 Bounty Trough (Davy 129/C REV)

Objectives stated concerned tectonics of passive margin formation, palaeo-oceanographic significance of Paleogene reflectors, extension of onshore Rangitata basement. Panel felt main potential strength was relation of thick, shallow pelagic section to Vail sea level sequences which had been extensively studied onshore by Loutit (Exxon). Collaboration with Loutit could greatly strengthen this proposal. Use of a non-Atlantic margin would be a valuable feature. Basement/break-up targets are probably mainly local problems, but could be tackled very quickly by extension to basement. Main interest SOHP, secondly TECP, NOT LithP as stated.

7.5 Ross Sea (Cooper et al. 244/C REV)

Objectives concerned Antarctic plate rifting and break-up history, early (>15 Ma) and later (<15 Ma) glacial history, and the formation of sub-ice deltaic sediment wedges. 4 or 5 holes originally proposed, including 1 deep (ca. 1500 m).

The Panel considered that the proposal was very promising but would not fly as an archetypal rifted margin. The most important aspects of the rifting were (a) the East-West Antarctic relative motion history is crucial to Gondwana reconstruction, and relevant sedimentary sections are very rare (b) Trans-

Antarctic Mts uplift in the Cenozoic is remarkable per se, its fission track history needs testing, its influence on glaciation was probably profound. The Ross Sea is also almost the last hope of a Cenozoic Antarctic preglacial/glacial history if Prydz Bay turns out to be a starved margin like the Weddell Sea margin. Also, the Sirius Fm implications need in situ testing.

Difficulties were (a) likely PPSP concern over stratigraphic traps beneath 40-60 m of overcompacted diamictite/till, and lack of crosslines, and (b) impracticability of deep hole (WRS 4) in ice-infested waters. Direct to TECP, SOHP.

7.6 Chile Triple Junction (Cande 8/E)

Main objectives are to characterise tectonic erosion of inner trench wall at present collision zone, development of new accretionary prism from continued slow subduction after collision, and metamorphism associated with high geothermal gradients. Also zero-age crust drilling, and effects of collision on upper slope basin.

Panel considered area had excellent opportunities for study of subduction-related processes. Some of the problems need better definition, and Panel hoped that MCS survey due in January would improve penetration in fore-arc south of collision zone. Also gas-hydrate BSR on collision fore-arc could limit permitted penetration, again needs better definition from MCS. Direct to TECP, LithP (zero age).

7.7 Southeast Pacific (Hays 153/E)

3-site N-S transect along 78°W off Tierra del Fuego for high-resolution Neogene sub-Antarctic palaeo-oceanographic record. Panel considered the N-S transect's objective could be attained on E-Pacific Rise flank (see 8.5 below) if sedimentation rates high enough, but at least 1 site here would be valuable to give surface palaeotemperatures where modern temperature influences Patagonian ice cap volume; sensitive climatic indicator. Ciesielski offered help with Patagonian connection.

7.8 Eltanin FZ (Dunn 209/C)

Two aspects (a) basement age and petrology relevant to absolute plate motions and (b) Cenozoic palaeoclimate, Polar Front migration etc. Panel considered in detail only the (b) palaeo-oceanography aspect, and then essentially as part of the EPR transect proposal of the USSAC Workshop (see 8.5 below), which grew out of Dunn's proposal, at the Workshop.

8. In addition to individual proposals formally submitted to the JOIDES Office, the Panel reviewed some proposals (essentially the more southerly) from the USSAC S. Pacific workshop, with the aim of encouraging the proponents to work them up into more mature proposals, concentrating on thematic panel concerns.

8.1 Woodlark and Manus Basins (D7, 8a)

Main Woodlark concern is with uplift and magma chemistry of ridge crest and near-trench fore-arc, in end-on ridge subduction. A good collision end-member, proposal worth developing. Manus fore-arc objective is age and nature of shallow-buried lavas on fore-arc, relation to regional tectonics. Thematic aim unclear. Panel uncertain as to whether WPAC or CEPAC had considered these.

8.2 Antarctic Peninsula: Ridge Crest Subduction

Linked objectives (a) vertical motion related to ridge crest subduction (b) Antarctic glacial history (c) relation between glacial shelf sediment transport and basin turbidites. Complements S. Chile proposal: subduction stopped so record preserved. Direct to TECP, SOHP.

8.3 Bransfield Strait

Several proposals covering (a) organic geochemical evolution (standby site W10 for Leg 113, proposal since updated) (b) ensialic back-arc basin structure; chemistry, history (c) high resolution Quaternary climatic record. Status of this proposal unclear: OSU, Rice, UTA group should consider collaboration.

8.4 LithP objectives compared with proposals in USSAC report (Fisk): most relevant area Chile Rise (7.6 above), Bransfield Strait (8.3 above) and Eltanin FZ/Louisville Ridge (7.8 and USSAC SPAC F.3), Ontong-Java and Manihiki Pl. (WPAC or CEPAC).

8.5 N-S Transect (evolved from 209/C, see 7.8 above)

Uses Pacific Antarctic Ridge and EPR flanks for evaluation above CCD. Close spacing for Neogene, wider for Paleogene, extends 61°S - 30°S . (Report p. 201 and 149 et seq). Aims map growth and N-S migration of Polar Front and ACC axis, and sub-tropical gyre, where unconstrained by topography. Very strong thematic proposal, but lacks geophysical data base and will need site survey. Difficult to arrange site survey because (a) has little merit except as site survey for drilling and (b) may have to be split at 50°S because of DPP/MG&G demarcation in NSF. Needs firm proposal submitting soon and a consortium to make site survey proposal. One opinion is combine with ridge crest dredging and basement drilling proposal, both for site survey and drilling. Problem is that N-S palaeo-oceanographic transect will need considerable drilling time, maybe unwise to compromise.

Action: Cande and Kristoffersen will review Lamont profiles for enough data to allow Ciesielski to submit a drilling proposal based on workshop text: site survey proposal to be discussed at GSA, late October, rumours of interest from Dunn, Hodell, Burckle, Webb, Mountain, Frohlich.

8.6 Antarctic Margin for Glacial History

No one area will solve all problems. On Wilkes Land margin (7.1, 2) and at Prydz Bay (119), topset beds are missing, so interpretation of processes is more difficult. Topsets present in Ross Sea (7.5) but signal will be mixed E and W Antarctic, and

on Antarctic Peninsula margin (8.2) but only perhaps last 8 Ma recorded. Extremely valuable if the connection between shelf glacial processes and basin turbidites could be established.

9. AOB

9.1 Response to Panel Function Change

Further discussion on Items 5.1 to 5.4 following the proposal review process (Items 6, 7, 8). Conclusions were similar: streamlining the system would remove the assistance now given to proponents by the regional panels: a poorer standard of proposal, and fewer proposals, may result. Pointed out that all SOHP members do not now see all SOHP proposals, only a presentation of them. It is important that the role of regional panels in thematic issues is debated and resolved.

9.2 New ODP Publications Policy

The cores (etc.) and the publications are the only permanent legacy of ODP. Degradation of publication standards is a bad mistake. Copy editing of text and diagrams should be restored.

9.3 Membership Rotation

Kennett, Ciesielski and Elliot were all proposing to rotate off the panel. SOP recognised the considerable contributions that all three (but particularly Jim Kennett as Chairman in the early days of SOP) had made to fostering the cause of Southern Ocean drilling, and thanked them all.

In view of uncertainties over the changing SOP function, it may be difficult to persuade people to join the SOP to replace them. Strong thematic replacements were felt to be needed. Suggestions were Corliss or Hodell for Kennett, Barron or Lazarus for Ciesielski, Domack or Krissek for Elliot.

9.4 Next Meeting

Should be soon after 119 and 120 so that lessons learnt can be assimilated. However, present proposals are for SOHP, LithP meetings in March and TECP in June, and new structure means that SOP should respond to those. Kristoffersen kindly invited SOP to Norway and suggested May, but that could be too soon. SOP would like to accept the Norwegian invitation.

P F Barker
SOP Chairman
8 November 1987