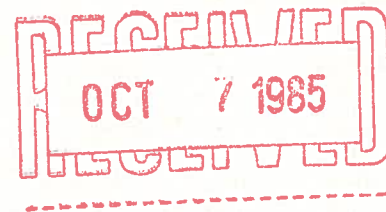


SOUTHERN OCEANS PANEL MEETING
Woods Hole, September 19-20, 1985

EXECUTIVE SUMMARY OF MAIN POINTS



SE PACIFIC PROPOSAL (HAYS)

- * SOP considers objectives worthy but should be considered within framework of later South Pacific drilling. Has lower ranking than Weddell Sea and south Atlantic Subantarctic drilling.

WEDDELL SEA DRILLING

Logging:

- * Realistic logging times should be considered with drilling estimates. It should then be decided where to place logging efforts in consultation with the co-chiefs.
- * Current schedule by SOP lists only logging for W-4. Of the remaining sites, W-6, W-7, and W-8 could benefit most by logging.
- * SOP wishes to have a member of the logging group present at the next meeting.

Drilling Priorities:

- * Objectives of W-10 (Bransfield Strait) were again reaffirmed. But drilling should not jeopardize the three South Orkney sites (W-6; W-7; W-8). W-10 remains an alternate site to be drilled at beginning or end of leg.
- * W-6 should be moved to Jane Basin.
- * W-4A priority retained.

Other:

- * SOP recommends that TAMU contact Navy to provide ice cover information for Weddell Sea.
- * SOP does not believe it necessary to endorse particular ports at this time (i.e. Cape Town; Port Stanley; Punta Arenas, etc.), but requests that PCOM place prime consideration upon ensuring that scientific objectives are met.

SUBANTARCTIC DRILLING

Site Surveys:

- * SOP feels strongly that pending site surveys for the subantarctic transect be carried out without further delay.

Drilling Priorities:

- * SOP recognizes that in a "worst case scenario" for Weddell Sea drilling, the highest priority during the following subantarctic leg would be in completing Weddell Sea objectives.
- * SOP rankings of subantarctic sites are similar to those of SOHP. Final rankings will be decided after site surveys are completed.

EAST ANTARCTIC MARGIN-PRYDZ BAY DRILLING

- * Excellent Australian MCS lines are now available. Sites K1, K2, and K3 can easily be located on these dipping reflector sequences. Scientific prospects excellent but much drilling required. K4 is problematic because of slumping and requires further attention.

NORTH KERGUELEN DRILLING

- * The following plan was agreed upon: Drill KH-1 to 900 m into top of reflector I1, then move to KH-3 (perhaps select a slightly thinner section than the present site) and do exploratory drilling to about 300-400 m to top of I1. Attempt re-entry, wash down and continue drilling to basement; KH-4 remains as alternate basement site. KH-5 o.k. as is. SOP likes the site S8B and will keep it as alternate site. S8B requires site survey but has a relatively thin pelagic section and could therefore be surveyed by the RESOLUTION.

SOUTHERN KERGUELEN

- * Objectives at this time are to direct and influence the site surveys and ascertain that existing and new data are merged for the final selection of sites. SOP recommends that R. Schlich (France) and J. Falvey (Australia) be strongly encouraged to collaborate on this task. Both of them or their representatives should participate in the next SOP meeting.

OTHER SOUTH INDIAN OCEAN OBJECTIVES

- * Melville Fracture Zone. SOP strongly supports drilling in this feature but recommends a thorough SeaBeam survey.

SOUTH ATLANTIC WORKSHOP

- * SOP would like to co-sponsor this workshop. Suggests that it be held following drilling of the Subantarctic leg.

SOUTH PACIFIC WORKSHOP

- * Co-sponsored by CEPAC and SOP.
- * To be held in Gainesville, Florida in April, 1986.

CO-CHIEF NOMINATIONS FROM SOP

- * Weddell Sea leg - J. Kennett and D. Fuetterer
- * Subantarctic leg - J. LaBrecque and P. Ciesielski

LIAISON

- * Better liaison needed between LITHP and SOP.

SOUTHERN OCEAN REGIONAL DRILLING PANEL MEETING
WOODS HOLE OCEANOGRAPHIC INSTITUTION
SEPTEMBER 19-20, 1985

PRESENT

J. Kennett, chair
J. Anderson
P. Ciesielski
H. Dick
D. Fuetterer
F. Gradstein
K. Kaminuma
J. LaBrecque
A. Mayer, PCOM office
A. Meyer, ODP
R. Schlich, IOP
E. Suess
J. Weissel

AGENDA

9-19 A.M.

Introduction & approval of minutes
Review of RESOLUTION activities
Review of PCOM decisions
Review of Site Survey recommendations
South Pacific workshop
SE Pacific proposal (Hays)

9-20 A.M.

Weddell Sea drilling
Subantarctic drilling
South Atlantic workshop
Southern Indian Ocean proposals

East Antarctic margin drilling
Kerguelen Plateau drilling
Northern section

Southern section
Panel membership
Next meeting

19 September A.M.

1. Minutes of last SOP meeting April 22-24 at University of Florida, Gainesville were approved without changes.
2. A. Meyer reported on status of Baffin Bay drilling; APC (=advanced piston core) at site 645E recovered approx. 75% of sandy and silty lithologies. Of particular interest to SOP is experience with RV Chester in iceberg tracking and scouting. The nature and procedure for establishing emergency ice zones was presented to the panel and discussed in view of upcoming Weddell Sea drilling.
3. Ice scouting and good communication are essential for Weddell Sea drilling. RV Polar Duke and/or an Argentinian vessel are under consideration for this task. It seems important that besides ice tracking and adequate warning, steps should be considered for moving icebergs and growlers away from the RESOLUTION during drilling.

SOP recommends that TAMU contact the Navy soon to provide ice cover information for the Weddell Sea.

4. ODP Southern Oceans/Indian Ocean Drilling Schedule:

1987			
Jan	Weddell Sea	Jul	Red Sea
Feb	(70 days)	Aug	
-----		-----	
Mar	Subantarctic transect	Sep	Neogene package
Apr	(50 days)	Oct	
-----		-----	
May	competing proposals:	Nov	Kerguelen I
Jun	Davie Ridge, Somali Basin	Dec	
	SW Indian Ridge, Makran	-----	
1988			
Jan	Kerguelen II	Jul	Argo/Exmouth Plateau
Feb		Aug	
-----		-----	
Mar	Broken Ridge/S 90E Ridge	open	
Apr			

May	N 90E Ridge/Intraplate		
Jun	deformation		

At present there is discussion about the ports of call during these two southern ocean legs; i.e. whether Cape Town, Port Stanley or Punta Arenas. The panel feels that at this time it is not necessary to endorse one or the other of these alternatives. The prime consideration should be to ensure that the scientific objectives can be attained.

5. The logistics for the two Kerguelen legs are being worked out by ODP. One plan is to rendezvous at Kerguelen Island with the French supply vessel Marion Dufresne arriving from Reunion for crew exchange.

R. Schlich pointed out that this plan imposes a very short time window; exchange and resupply have to be completed between 1.12. and 1.15.1988 because of internal scheduling considerations. This time constraint and the expense involved prompted ODP to also look at other vessels for this task.

6. A. Mayer (PCOM, foreign liaison) reported on PCOM business and the status of non-US national memberships which crucially affect the finances of the entire ODP program as well as that of the U.S. site survey efforts;

Other PCOM business:

Bare rock drilling seems probable for a maximum of two legs since only two bottom assemblies will be available;

Besides Atlantic sites, the East Pacific Rise at 21 N is being considered.

Peru margin drilling has highest priority in the eastern Pacific and should not be impacted by schedule changes.

Latest "tentative" schedule as seen by PCOM was presented (see above).

The Indian Ocean Panel suggests moving Kerguelen Leg I to December 1987/January 1988 instead of November/December 1987;

Panel membership should be reviewed in January 1986 or thereafter when national ODP memberships are settled;

7. A. Mayer continued with the Site Survey Panel report:

- a. The Weddell Sea site survey picture looks generally good, with data still coming in from past austral summer cruises (Barker and Kristofferson). Particularly, crucial information is expected from RV Polarstern (Fuetterer) and RV Polar Duke (Anderson), which are scheduled for work in the Weddell Sea, Bransfield Strait and King George V Coast this coming austral summer.

The Site Survey Panel notes that there is no useful data for W-11 at data bank and existing SCS is not adequate; heat flow is required at W-10 (DPP proposal Sues; Bransfield Strait).

- b. Site survey data for the subantarctic transect are generally poor; they are lacking in quality and quantity. SOP is aware of the situation and endorses all efforts to obtain such data. Particularly crucial is the pending site survey proposal by Lamont-DGO (LaBrecque) to this area.

Specific Site Survey Panel recommendations concerning SOP's high priority sites SA-2, -3, -5, -7, -8 are:

(quotes from SSP minutes)

SA-1, -2, -3

SCS and piston core data available. Not available is 3.5 kHz or high resolution SCS. The quality/quantity of data was not considered sufficient to meet site survey requirements. A question was raised whether the SSP should evaluate the quality and/or sufficiency of piston core data with respect to achievement of scientific objectives. TAMU will advise on quality from engineering perspective. Consensus was that data bank needs to build up library of core locations.

Core descriptions in the area of proposed sites are needed for site survey assessment.

SA-4

Magnetics, gravity and SCS data are available. Not available are high resolution SCS, MCS, velocity determinations. Additionally, it would be desirable to have 3.5 kHz, side scan and piston

cores. Quality and quantity of data do not fill site survey requirements.

SA-5

One low quality SCS line exists but no velocity determination. Data does not meet site survey requirements.

SA-6

SCS exists but no high resolution SCS, velocity determination or piston cores. Data are insufficient, SeaBeam and sidescan would be desirable, but not essential.

SA-7

At present no data at all is available to support this site.

SA-8,-9

Low quality SCS data are available. Magnetics and gravity are on scattered lines but OMD synthesis (including SeaSat) includes excellent regional interpretation in this area.

SSP motion

The SSP notes that site surveys for the subantarctic proposal are not well documented. The panel strongly recommends that further site surveys are needed and these must include:

large water gun digital SCS

3.5 kHz

piston cores in the vicinity of each proposed location

magnetics and gravity data

The above motion refers to the current high priority sites SA-2,-3,-5,-7 and -8. The SSP has a copy of the L-DGO site survey proposal. It appears to meet most of our concerns except at SA-4.

Recommendation

SOP feels strongly that the pending site surveys for the subantarctic transect need to be carried out without further delay.

d. North and South Kerguelen

For the northern area, SCS lines and crossing are available from Schlich & Munsch in updated French proposals for ocean drilling, ODP-France vol.I July 1985.

For the southern part two French cruises are planned this coming season with MCS work along a N-S transect as well as detailed surveys in the area of proposed sites. Fifteen days of dredging in the southern area are part of this site survey.

SOP strongly endorses both objectives of the French site survey proposal.

Schlich is attempting to coordinate available French and new Australian information (refraction and MCS) but so far only sparse data have been made available.

SOP strongly supports and encourages collaboration with the Australian scientists (see also next panel meeting).

e. Prydz Bay site survey data have been made available by Australian scientists through J. Anderson; necessary information appears in good shape.

8. South Pacific workshop

P. Ciesielski reports that the proposal for a South Pacific Antarctic margin drilling workshop has been funded. The panel discussed dates and other issues and decided that the workshop be held beginning 19 April 1986 to fully utilize weekend air fares for invited participants. The substantial savings permit additional invited participants.

SOP recommends that no more than 60 participants should be invited and no travel commitments be made until after 1 December 1985. Announcement of the workshop has appeared in NATURE, the full text of which is as follows:

THE OCEAN DRILLING PROGRAM CALLS FOR DRILLING VESSEL JOIDES
RESOLUTION TO OPERATE IN THE PACIFIC OCEAN DURING ALL OR PARTS OF
1989-1990.

In order to develop a drilling program that will address problems in tectonics, the nature of the lithosphere, paleoceanography and sedimentology processes in the South Pacific and Antarctic margin, a planning workshop will be held at the University of Florida (Gainesville) during mid to late April 1986. The workshop is funded by the Joint Oceanographic Institutions. Financial assistance is available to U.S. scientists through the workshop organizers. Potential participants should submit by December 1, 1985 a summary of contributions they could make to the meeting.

Submit correspondence to any of the following meeting organizers:

P. Ciesielski, Dept. Geology, University of Florida, Gainesville, FL 32611; J. Mammerickx, Scripps Institution of Oceanography, La Jolla, CA 92093; J. Weissel, Lamont-Doherty Geological Observatory, Palisades, NY 10964; J. Anderson, Dept. Geology, Rice University, Houston TX 77251.

9. J.D. Hays (L-DGO) proposed 3 drill sites in the south-east Pacific to recover a Neogene section as complete as possible. Seven days of drilling are requested following the Peru margin leg and preceding Weddell Sea drilling. The proposed objectives fall within SOP's mission; the panel considers them worthy but they should be attempted within the framework of South Pacific drilling (see also workshop).

Furthermore, the proposed drilling opportunity for the SE Pacific could impact the subantarctic transect by pushing its schedule too far into the poor weather window. In comparison with Weddell Sea and South Atlantic subantarctic drilling, the SE Pacific objectives are considered of lower ranking.

19 September P.M.

10. Weddell Sea drilling, - a detailed assessment:

The panel discussed the SOHP document on prioritization and recommendation of Weddell Sea drill sites.

Logging was discussed in light of SOHP's recommendation that all holes be logged. P. Ciesielski relates from experience on Leg 104 that the logging time estimates are way out of line with reality and generally high by a factor of 2-3. This translates into sacrificing primary drilling objectives.

SOP wishes to invite a member of the logging group for education on the availability of logging tools and advantages of logging. Some members of the SOP still feel that logging of all holes eliminates important scientific drilling objectives.

SOP's previous estimates for the Weddell Sea leg drilling time lists only logging of site W-4. Of the remaining sites, SOP is of the opinion that sites W-6, -7, and -8 would benefit most by logging.

In summary, realistic logging times should be combined with drilling estimates for the Weddell Sea leg and then it should be decided where to place the logging efforts in consultation with the co-chiefs.

Contrary to general belief, the presence on board RESOLUTION of the logging team does not imply that all holes should be logged. It is quite possible to log only selected sites in order to optimize drilling time.

The scientific objectives of site W-10 (Bransfield Strait) were again reaffirmed by SOP, but drilling W-10 should not jeopardize the three sites on the South Orkney block which compose a depth transect. W-10 remains an alternate site to be drilled either at the beginning or the end of the Weddell Sea leg depending on the weather and ice conditions.

SOP recommends that W-6 be moved to the Jane Basin based on new data obtained by P. Barker.

SOP retains the original priority of W-4A

11. National Institute for Polar Research, Japan, Weddell Sea proposal

K. Kaminuma, K. Shibuya, H. Kinoshita and K. Kobayashi propose 5 sites with lithospheric objectives for the Weddell Sea. All are located in water depths between 4200 and 5000 m. So far none of the locations have been coordinated with the proposed drill sites.

SOP feels that more information is needed, particularly on seismic facies, and that a complete meshing with the existing drill sites should easily be accomplished since the objectives proposed by the National Polar Research Institute of Japan are largely the same

as the tectonic objectives incorporated in the present plans for Weddell Sea drilling. A mature proposal should take this overlap into consideration.

12. Prioritization and summary

SOP needs to study the new site survey information, recalculate the drilling times and logging estimates, consider the feasibility of re-entry at W-4 under potential ice conditions and then proceed with the finalization of sites and work up a realistic schedule.

13. Subantarctic transect

Discussed SOHP document and suggested prioritization; rankings of sites largely agree among the two panels and SOP concedes that SA-7 could perhaps be dropped but that should be decided after site survey is completed.

SOP recognizes that in a "worst case scenario" for Weddell Sea drilling a good portion of the following subantarctic transect would be spent completing Weddell Sea objectives.

14. South Atlantic workshop

A South Atlantic workshop has been initiated by the Atlantic regional panel. SOP believes that it would be better to hold this workshop following drilling of the Subantarctic Leg and that the workshop should be co-sponsored by SOP.

15. Southern Indian Ocean proposals other than Kerguelen

K. Hinz and H. Dostman (BGR, Hannover) propose drilling on the Tasman Rise. The objectives are timing and environment of Gondwana fragmentation and the nature and age of regional seismic unconformities. SOP recognizes the conceptual strength of this and other proposals. Their realization, however, depends so strongly on the route by which RESOLUTION exits the Indian Ocean, that PCOM is urged to await the outcome of the South Pacific Workshop in April 1986.

R. Butler (HIG, Honolulu) proposes a seismic observatory in the Crozet Basin antipodal to the Nevada Nuclear Test site. A single re-entry hole is requested to emplace a borehole seismometer and recorder package. This experiment would yield unique data on the structure of the inner core and the properties of the inner-outer core and core-mantle boundaries.

SOP is not equipped to judge the scientific merits of this proposal but recognizes that it is an original experiment. SOP also raised the question of servicing and redeployment of the instrument package once the hole is completed. As far as sedimentary-paleoceanographic objectives are concerned, a single site at the proposed location is not considered of high merit.

R.A. Stephens (WHOI) proposes to study the upper basement velocity structure along a vertical offset of the SW Indian Ridge Fracture Zone. This proposal is a companion proposal to study mantle heterogeneities by fracture zone drilling (H. Dick, WHOI).

A lengthy discussion ensued, from which it became clear that a thorough SeaBeam survey of the proposed drill sites seems essential.

SOP strongly supports drilling on the Melville Fracture Zone. The SW Indian and American-Antarctic ridges are a major portion of the circum-Antarctic plate boundary with a unique combination of extremely slow spreading rates and numerous closely spaced fracture zones, which provides the best opportunity of drilling the shallow mantle of any region in the oceans. Drilling the mantle and determining the shallow stratigraphy and lateral variability along a fracture zone floor would provide a deep window into the geodynamic processes operating beneath fracture zones at ocean ridges, not possible by any other technique. Extensive rock dredging on the SWIR and AAR fracture zones indicate that gabbroic rocks representing layer III are nearly absent and that altered mantle peridotite is twice as abundant as basalt. In contrast, at slow spreading ridges basalts are the most common rock type from fracture zones and gabbros greatly exceed peridotites in abundance (e.g. the Kane Fracture Zone and the MAR). Evaluation of shallow mantle and crustal stratigraphy along the floor of a SWIR fracture zone, therefore is far more likely to unambiguously demonstrate that crustal formation processes near fracture zones are different than at the mid-point of ocean ridge segments.

20 September A.M.

16. Prydz Bay - East Antarctic margin

J. Anderson presented Australian MCS lines with excellent dipping reflector sequences on the shelf. Sites K-1, K-2 and K-3 can easily be located on these sections to ensure complete coverage of section. K-4, at 3000 m of water depth, is problematic because of slumping. K-4 will be kept as contingency site.

SOP suggests obtaining 3.5 kHz profiles and establish velocity structure to ascertain nature of "old" section (volcanics). This can be complemented by coring and dredging during site survey (J. Anderson).

Rough estimate of drilling time at East Antarctic margin suggests a "worst scenario" of over 2500 m of coring; therefore SOP is considering drilling youngest and oldest sections first and then "filling in" as much as possible and as time permits.

The possibility of a Japanese site survey 1986/1987 with Hakuei Maru should be explored. K. Kaminuma will look into this situation

and related schedule changes. An Australian participant will be invited to next SOP meeting (see also Next Meeting).

17. Northern Kerguelen

Prioritization and rankings of the Kerguelen-Heard Plateau sites by the various panels are as follows:

	SOP	SOHP	IOP	Remarks
Site	KH-1	KH-1	KH-1	Neogene section
	KH-3A	KH-3	KH-3	KH-3A has thicker older section than KH-3 basement
	KH-4A		KH-4A	
	KH-5A	KH-5A	KH-5	
		S 8 B		

After considerable discussion the following plan for drilling the northern Kerguelen-Heard Plateau was agreed upon:

Drill KH-1 to 900 m into top of reflector I1, then move to KH-3 (perhaps select a slightly thinner section than the present site) and do exploratory drilling to about 300-400 m to top of I1. Attempt re-entry, wash down and continue drilling to basement; KH-4 remains as alternate basement site. KH-5 o.k. as is. SOP likes the site S 8 B and will keep it as alternate site. S 8 B requires site survey but has a relatively thin pelagic section and could therefore be surveyed by the RESOLUTION.

TAMU is asked to calculate the drilling and logging times. SOP's best estimate at this time is between 57-68 days for sites KH-1, KH-3 and KH-5.

18. Southern Kerguelen

The objectives at this time are to direct and influence the site surveys and ascertain that existing and new data are merged for the final selection of sites. SOP recommends that R. Schlich (France) and J. Falvey (Australia) be strongly encouraged to collaborate on this task. Both of them or their representatives should participate in the next SOP meeting.

Preliminary prioritization and rankings:

SOP	SOHP	IOP	Australian proposal
K-11	K-11	not yet	no equivalent site
K-5	K-5	ranked	KP-12
K-12			KP-2
	K-10		
K-7	K-7		no equivalent site

19. Other business:

SOP chairman should inquire about status of liaison between LITHP and SOP.

During next meeting SOP should establish additional contingency sites for the Weddell Sea leg.

R. Schlich, K. Hinz and R. Falvey should be present at the next SOP meeting.

SOP nominations of co-chief scientists for Weddell Sea drilling are:

J.P. Kennett

D. Fuetterer

for the subantarctic transect:

J. LaBrecque

P. Ciesielski

J. Anderson provided written justification to the SOHP for drilling the George V continental margin. After reviewing the draft, SOP suggested including as a major objective to ascertain the break up history of this margin.

Separation of Australia and Antarctica supposedly occurred during late Cretaceous time and eventually provided an open passageway between Indian and Pacific oceans. Sites drilled on the Adelie continental margin should provide a record of the development of the Australian sector of the Antarctic continental margin and of climatic, faunal and floral evolution and paleoceanographic change as separation of these continents progressed and Antarctica's climate deteriorated.

French seismic data from the Adelie Land continental margin show a thick sequence of sedimentary deposits dipping gently seaward and truncated at the seafloor by a glacial unconformity. As in the Prydz Bay area, this provides an opportunity for sampling ancient strata in a series of relatively short holes drilled along a cross-shelf transect, but the potential benefits of drilling in these areas differ.

It is unlikely that the East Antarctic Ice Sheet spread in all directions at the same time during its early development. Consequently, documentation of its development will require drilling in several areas of the continental margin. The Wilkes Land Basin has probably had a complex glacial history because it is situated in a region of primarily divergent drainage today, but in the past it may have captured a considerable portion of the ice draining from the continent. Likewise, during its early development the ice sheet which covered the basin may have been unstable; it is situated well below present sea level. Evidence for this is found as marine microfossils in the Cerious Formation, which imply the existence of a marine seaway in the Wilkes Basin as recently as Pliocene time (Webb and colleagues). Sites drilled on the continental margin of the George V Coast, which is situated adjacent to the Wilkes Basin, would hopefully provide a record of the early glacial history of this area as well as more recent ice sheet fluctuations.

20. Next panel meeting

May 12-14, 1986; SOP strongly favors Australia as meeting site for coordination of newly obtained site survey data. Australian and French investigators will be able to provide optimal input at this time since their respective field work in the southern part of the Kerguelen-Heard Plateau will have taken place. Alternate meeting site Bremerhaven/FRG.