



Minutes of the Western Pacific Panel of ODP

October 2 to 5, 1984

Lamont-Doherty Geological Observatory, Palisades, New York

List of Persons Present:

Panel Members

Michael Audley-Charles	University College London
Kazuaki Nakamura (TECP)	Earthquake Res. Inst., Tokyo
Jim Natland	DSDP, SIO LaJolla, CA
Jacques Recy	ORSTOM, Noumea
Claude Rangin	CNRS, France
Hans Schlüter	B.G.R. Hannover
Brian Taylor	H.I.G. Hawaii
Margaret Leinen (LITHP)	U. Rhode Island
Marcus Langseth	L-DGO
Derk Jongsma (Rapporteur)	Free Univ. ESF Consortium
Eli Silver (Chairman)	Univ. of Calif., Santa Cruz
Dennis Hayes (PCOM liaison)	L-DGO
Reinhard Hesse (2,3,4)	McGill Univ., Montreal

Invited Participant

Andy Stevenson	U.S.G.S.
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Observers

Stephen Lewis	L-DGO
Kensaku Tamaki (1,2,3)	U. Rhode Island

ODP Representative

Elliott Taylor	TAMU
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Absent

James Ingle	Stanford U.
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Tuesday, 2nd October, 1984

Morning Session

At the 2nd meeting of the panel several additional members were present to provide input from the thematic panels (Nakamura-TECP, Leinen-LITHP, Hayes-PCOM) and to fill the previous gap in expertise on the SW Pacific (Recy-ORSTOM, Stevenson - USGS).

Status of ODP Preparations

Elliott Taylor (ODP) reviewed progress in converting the drilling vessel. It is proceeding on schedule, shakedown cruise will be in December, 1984. ODP staff is now at about 100 and is projected to be 150 to make up the full complement. Labs, equipment and facilities and their location on the ship were explained. Plans for the ODP building are out for bids.

PCOM liaison Hayes briefly set out the capabilities of the vessel and discussed the position of the ODP memberships. Germany and France have signed, Japan will join in 1986 (may cause difficulty in funding travel in 1984/ 1985 to join meetings), Canada, ESF are positive. England's participation not yet sure. Due to much higher costs of refitting the ship than those estimated, a deficit of \$4 million looms. It is crucial that at least one more ODP member signs up besides Canada. A partnership between ESF consortium and Australia could prevent cancellation of important aspects of the proposed program.

Plans for Initial Reports in two parts.

PART A will consist of site chapters, planned to be ready for printing ~12 months after completion of drilling leg. PART B. Scientific results and syntheses goes to printer ~ 30 months after execution of drilling. Brian Taylor urges routine inclusion of magnetic stratigraphy in Part A. The first 15 legs are planned, except that 111, 112, 113 are still tentative. Expected entry into West Pacific region is mid to late 1988. Global-circuit in 5-6 years. Time is now for WP-RP to prepare for site surveys. The JOIDES office has moved to Rhode Island with Roger Larson in charge. Proposals are to be sent there from now on. WP-RP should establish the status of its proposals at this meeting and fill in the submission forms where possible. Holes based on proprietary data should not be considered. Proposals ought to be supported by pertinent geophysical data, of which copies must go to the JOIDES/ODP bank in Lamont. Amount, quality and ready-access to the data by the community will play a large role in the decision to drill. Minimum requirement of PPS-SP is crossed seismic lines over the proposed site. WP-RP should phase into a meeting schedule that proceeds PCOM meetings by at least 3 or more weeks.

Relation/Interaction between Thematic and Regional Panels

As has happened in the other panels a discussion concerning the hierarchy and interaction between the different panels ensued. A recommendation to PCOM by the TECP to set up a Sunda-Banda Arc Working Group was passed on for discussion by the panel. The principle of equal status for both types of panels is causing some confusion at this early stage. There is a need for better liaison between them, not only thematic to regional but also vice versa. In the WP-RP, liaison with SOHP is the most acute problem. The suggestion was made to have this panel's expert, Ingle (although concern at

his non-attendance at this meeting was expressed), participate in the SOHP panel since SOHP presently lacks expertise in the WP region. There was some feeling that the overlapping responsibilities could cause duplication of effort and that this would be avoided if the proposals came from the regional panels. Conclusion was that a site would have maximum viability with PCOM if it carried the support of many panels. The lack of interaction between the LITHP and SOHP at present was realized to be due to their involvement in planning the immediate legs for ODP drilling. WG's need to work closely with their Parent Regional Panels.

AFTERNOON SESSION

LITHP Liaison

The various members briefly stated what they would like to present and discuss at the meeting. Leinen started with explaining the rationale behind the LITHP's objectives, namely - generation, evolution and alteration of oceanic crust. Of these the first is the most difficult one to address. Their approach is to establish sites to recover newly formed crust and to provide a natural laboratory for monitoring the processes. Innovations in logging technique and downhole instrumentation will greatly enhance future returns. They have had to move fast in choosing sites for the Atlantic & Pacific because the legs were planned, and have selected sites on a slow spreading ridge (MARK I area) and a fast spreading ridge (EPR 10-13° N). Both targets are on zero age crust to get at the generation processes and have been studied in depth. LITHP is looking toward WP-RP for a suitable site to investigate ocean crust generation in a Back Arc basin. Leinen solicited identification of individual areas, (in which problems WP-RP wants to address

can be solved) bearing in mind zero age constraint, and suggestions for ways to get community input. A proposal for a W. Pacific Arc workshop has been submitted and an ad-hoc working group of LITHP members and engineers are looking at optimum ways to drill the holes. Basic idea is to have 2 holes along strike of the ridge, half a hydrothermal wavelength apart and a third perpendicular. A number of different types of experiments was outlined. Currently the Mariana Trough and Lau Basin have the largest data bases but major surveys are planned in (these and) other areas. Data bases are such that proper site surveys can be planned to address these sophisticated questions.

TECP Liaison

Because Nakamura was unable to attend the last TECP meeting, he arranged for Jeff Weissel (L-DGO) to inform the meeting of progress. TECP will not formulate proposals and is addressing their balancing role. Their concern is oceans and their margins divided into passive margins, active margins and mid plate problems. They vote on priorities of individual topics in these categories. Their choice of Peru, and Chile (active margins) to fill in two legs of 111, 112 or 113 balances Norwegian Sea and Galicia Bank (Passive margin problems). TECP is concerned with lack of formal proposals so far from WP-RP and favour those which culminate a completed study. Their recommendation to establish a Sunda-Banda Arc Working Group is to ensure that this area, in Plate convergence does not fall in the crack between the IORP and the WP-RP. WP-RP considers this area as part of their responsibility.

Drilling Objectives

Since representation for the S.W. Pacific at the 1st meeting of the Panel was incomplete, this 2nd meeting concentrated on input by experts from this region.

Recy outlined the New Hebrides Arc and showed increased data base. There is nascent spreading in the back arc area in two places called Coriolis trough north and south of the region where the D'Entrecasteaux Ridge collides with the Arc. Southern and northern Coriolis Basins are identified as drilling targets in addition to the sites addressing collision of the D'Entrecasteaux Ridge with the New Hebrides) which were proposed during the previous meeting.

Nakamura pointed out the striking similarity with the junction Bonin/Marianan Arc where collision between the Ogasawara Plateau limits opening of the Mariana Trough.

Stevenson showed USGS data base over Tonga Arc and Lau Basin near 22°S. An active back-arc spreading centre (the Valu-fa (84) Ridge) is marked by very clear reflections from a proposed magma chamber (depth of 4 km below sea-floor). Again there is collision of an aseismic ridge/seamount chain (the Louisville Ridge) with the arc in the vicinity. A drilling transect across the back arc (Lau basin to Tonga Forearc, multisite) was proposed, together with a hole in the inner trench slope to address the nature of the process by which the Louisville Ridge disappears under the arc.

Wednesday, 3rd October 1984

MORNING SESSION

New Hebrides and Solomon Arcs - Polarity Reversals

Stevenson (USGS) showed data base over S.W. Pacific arcs. In the New Hebrides several sites are proposed to address (i) Seaward dipping reflectors in the inner trench slope (ii) Nature of D'Entrecasteaux Ridge, (iii) Inter-arc basin - formation history, and polarity reversal. Subduction polarity reversals can be studied in New Hebrides and Solomons (Taylor). How quickly these polarity reversals happen ought to be investigated, and the WP region is ideally suited for this. The volcanic history of an arc (Hayes limits to the size of volcanoes Audley-Charles), and the reason for pulses of increased activity (Hayes) are factors which need to be researched. Recy and Schlüter briefly reviewed marine research planned in New Hebrides, North Fiji Basin, and Tonga areas with the Jean Charcot and Sonne (see Table 1). Stevenson then showed U.S.G.S. data in the Solomon Arc. Chief objective is timing of collision with Ontong Java Plateau and its relationship to arc polarity reversal. Onlap patterns in sequences on Multichannel profiles provide means to attack this question in conjunction with onshore data. The problem of drilling in volcanoclastics was pointed out by Natland. The panel discussed how to come to grips with arc polarity reversals. Sites where most complete sections are present for geohistory analyses should be selected as targets Jongsma. It was considered desirable to promote informal working groups of people familiar with the New Hebrides and Solomon Arcs at this stage. Discussion by the panel members led to the conclusion that interarc spreading and arc reversals are processes which can only be elucidated by drilling in this region.

Japan-Bonin region - NW Pacific

This region has as targets:

- (i) The Japan Sea back-arc spreading - ages, processes in the basin, and nascent subduction along the western margin of Japan.
- (ii) The Zenisu Ridge - Incipient overthrusting.
- (iii) The Nankai Trough: several sites to study deformation process along the inner slope.
- (iv) Okinawa Trough - Young back arc basin formation, subsidence, and stretching.
- (v) Bonin Arc - serpentinite diapirs. Forearc and nature of basement together with stratigraphic history in the Forearc basin and back-arc rifting.
- (vi) Mariana Back - Arc Basin Seamounts; influence of cross chain volcanism on back arc basin crust.

Planned Marine Geological/Geophysical Work in the Western Pacific

The panel members then summarized the upcoming research planned in the region (see Table 1).

A substantial regional MG&G data base exists for the Western Pacific. However, the WP-RP recognizes the need for extending this data base in order to develop the best rationale for defining the important geological problems that will require ODP drilling in the region.

To that end, we have identified a number of MG&G field programs in the Western Pacific that are scheduled or proposed for next 2-3 years (See table 1). The panel is enthusiastic about the prospects of this extensive field work and recognizes that such work will provide a very valuable contribution to short and long term ODP planning efforts.

Afternoon Session

The meeting broke up into smaller groups to consolidate the drilling proposals.

Indonesia - Silver, Audley-Charles, Schlüter, Jongsma, Hesse.

Japan - N.W. Pacific - Nakamura, Langseth, Taylor, Leinen, Tamaki

South China Sea - Schlüter, Rangin, Lewis, Hayes, Taylor

SW Pacific - Recy, Stevenson, Leinen, Natland, Hayes

Thursday, 4th October 1984

During the morning the work in smaller groups continued.

Afternoon Session

Members of the smaller groups presented overviews of the themes and problems which drilling should address.

South China Sea/Sulu Sea Region.

The complex pattern of rifting, passive margin formation, subsidence and sedimentation of microcontinental blocks, arc-continent collision and ongoing subduction, deformation and volcanism needs a series of transects to further constrain the geometry. These transects should cross:

- (i) The Northern South China Sea passive continental margin
- (ii) The Southern South China Sea conjugate passive margin
- (iii) The Palawan Trough Sulu Sea collision zone
- (iv) The Dangerous grounds - Southwest China Basin margin
- (v) The active Manila Trench convergent plate boundary. Including
 - a) North Luzon Ridge.
 - b) Scarborough Seamounts.
 - c) Mindanao/North Palawan continent-continent suture zone

The history of this region is important for the whole S.E. Asia region and our understanding of the effects of India as an indenter.

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- (vi) Mariana Back - Arc Basin Seamounts; influence of cross chain volcanism on back arc basin crust.

Friday, 5th October 1984

Morning Session

S.W. Pacific

Natland summarised a proposed transect across active and inactive arcs from the Lord Howe Rise to the Tonga Trench. (Exon & Symonds). In the Coral Sea subsidence of the Queensland Plateau and rifting of the Coral Sea was proposed. This area provides another possibility to study passive margin evolution at around 60 Ma, and paleoenvironment of an area which has travelled through many latitudes. He then went on to the younger arcs where a set of interfingering proposals address:

- (i) influence of collision with plateaus and seamount chains
e.g. Ontong Java Plateau - Louisville Ridge.
- (ii) Subduction Polarity reversals: e.g. Solomon and New Hebrides
Arcs
- (iii) Back Arc Basin generation - Solomons, Coriolis Trough and Lau
Basin.

Through these targets the magmatic history can be addressed in relation to the results obtained from the above. In short the Southwest Pacific area can address the older fragmentation of Australia and the evolution of the younger Plate Boundary from the Solomons to the Tonga Arc. The S.W. Pacific is also

suitable for studying the formation of mineralization as related to the evolution of the marginal basins.

Indonesian Region

Here there are a series of sites which focus on the main aspects of an oceanic subduction zone which passes into a continent-arc collision zone. The approach here is to study the progression from oblique convergence of oceanic plate in the west off Sumatra and of normal convergence off Java, to normal continent-arc collision convergence in the Timor Trough and oblique continent-arc collision at the eastern end in the Tanimbar and Aru Troughs. In order to constrain the evolution of the continental collision in the Banda Arc the Banda Sea requires drilling in the basins to the back of the volcanic arc and in the forearc. Both age constraints on the crust in the Banda Sea and within the stratigraphy of the sedimentary cover will provide viable keys to unravel the collision zone. Especially interrelations between the vertical and horizontal motions will be addressed here.

Next Meeting

Discussion of the possible schedule showed that a meeting before March is necessary since after that a number of members would be at sea conducting surveys.

7:30 a.m. on Friday, 18th January end by 1 p.m. on Sunday, 20th January.

Place: Hawaii Inst. of Geophysics

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Workshop on and in Western Pacific region

The panel feels the need to have a workshop in the region which would also allow the interaction with scientists from the countries there. Avenues available such as CCOP and SOPAC to generate this will be pursued.

TABLE 1. PLANNED CRUISES WEST PACIFIC - 1984-1987

	Japan - Phil. Sea	South China Sea	Indonesian Region	W.S. Pacific
U.S.A.	Mariana-Bonin Alvin H.I.G. (Jan.- April, 1986) Mariana Dredging? USGS: N. Mar. (EE286)	L-DGO mid-late '85 MCS, ESP, SEABEAM, HF		Manus Basin - Mid '85 N. Fiji Basin - Late '85 SEAMARC II - HIG.
W. Germany		B.G.R. MCS end 1984		Manihiki Pl., Lau B. Nth Fiji Basin 84/85 MCS, HF, Lord Howe R., S. Austral Early '85 MCS & Sampling
Japan	Japan Sea Okinawa Tr. Submers.'84 G.S.J. 84/85 Bonin/Und. Geophysics G.S.J. S. Japan Sea Geol./Geophys. MCS		E. Sunda Trench 86 MCS/OBS	Solomon Sea 1984. MCS Tonga Tr. MCS/OBS '85
France	Japan Margin 1984 (J. Charcot) + Submersible Surv.'85 Okinawa T. Ryuku Tr. (J. Charcot Sept-Oct '84)	Manila-Negros Tr. Oct- Nov (J. Charcot) '84 South China Sea J. Charcot: mid-1985	"Coriolis" Nov. 1984 Sunda St. Makassar St. H.F. SEABEAM Jean Charcot Arutr. 85	
Great Britain			IOS-Gloria/und. Geophys. E. Sunda Tr. Savu Sea S. Banda Sea, 1985-7 ?	IOS Gloria 1986-1987
E.S.F. Consort. (Holland)			Snellius II E. Indonesia Banda Arc. Geol. Geophys. 1984/85 ? MCS - 1986-87	