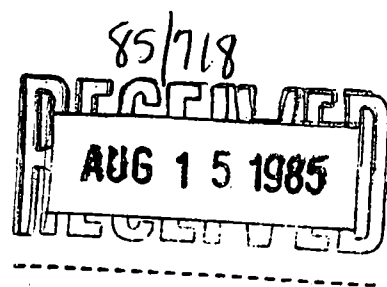


INSTITUT FRANÇAIS DU PETROLE

Direction de recherche
Géologie Géochimie



Minutes
Atlantic Regional Panel Meeting

Institute for Geophysics
The University of Texas at Austin
25-28th March 1985

L. Montadert
P. Meyers
L. Jansa
K. Klitgord
B. Tcholke
P. Robinson
J. Austin
J. Thiede
J. Mutter
A. Bally
J. Baldauf

Guests : O. Eldholm
Ruddiman

L. Montadert thanks J. Austin for organizing this meeting and the very interesting field trip in Central Texas, West of Austin.

Leg 103 - Galicia

L. Montadert exposed the results of the discussion on leg 103 drilling plan at the last PCOM meeting which was centered around a conflict between the proposed objectives to drill two single bit holes along the "Lherzolite Ridge" early in the leg and to drill 2 holes to sample the fore-rift, synrift and post-rift sediments: the conflict resulted from modifications of ARP recommendations proposed by co-chiefs and TAMU. The consensus of PCOM was to extend a 7 day time limit for drilling one single bit hole on the "Lherzolite Ridge". The ship would then proceed to set a cone at site 4B and drill to 1300 m into post rift and syn-rift sediments. The program would then drill a single bit hole in the post rift sediments and pre-rift basement near site 4A with the remaining time, the co-chiefs will decide to either go back to the ridge or to site 3A on a tilted continental block, or to return to 4B.

Asked about the "Lithosphere Panel" feeling about the "Lherzolite Ridge" target, P. Robinson commented that it was not a high priority but that it was interesting for tectonics.

In conclusion, ARP reiterates its recommendations on leg 103 drilling that site 4b be drilled approximately one half to one kilometer east of its location in "Scientific prospectus N°3"; this will assure that the oldest and most complete section of synrift sediments which lap westward onto the pre-rift sediments, will be drilled. If the complete pre-rift section and basement cannot be penetrated at this site, then these objectives should be attacked at site 4a.

Leg 101 - Bahamas

J. Austin gave a detailed report on results of leg 101 and distributed a draft of the preliminary report.

The leg is considered as successful for the slope transects and half successful for the deep objectives. The crew and the scientific party were excellent.

One of the main targets of the leg was the origin of Bahamian banks and basins and the search for new evidence to choose between two fundamentally different concepts: the graben hypothesis which calls for strong fault control of the bank-and-basin pattern and the megabank hypothesis which assumes that for most of the Jurassic and the early Cretaceous, Florida, the NW Bahamas and N. Cuba formed a single flat topped carbonate platform. At the end of the leg most of the scientific party were in favor of the megabank hypothesis, but some modifications of the concept are necessary. In particular it seems that the mid-Cretaceous platform drowning was not synchronous throughout the archipelago and that it predates the mid-Cenomanian sea level cycle of Vail and others (1977). The mid-Cretaceous desintegration of the megabank does not seem to be related to local tectonic deformation but rather to a crisis in the depositional system..., it could coincide with a tendency towards oxygen deficiency in the world ocean (Schlager, 1981).

Platform flanks were studied in two 3 hole transects using HPC. The results support the concept of "high stand shedding" of carbonate platforms as opposed to the generally accepted phenomenon "low stand shedding" of terrigenous continental margins.

It appeared also that by passing is an important process on both gentle and steep slopes, but rates of deposition remain high even on the steep slopes. This support both rapid lithification and burial of organic matter.

The main problems encountered were related 1.- to navigation, the system on board being considered as primitive. 2.- to a combination of geology and hydrocarbon occurrences which prevented to get the deep objectives. Because of these problems 10 days were left at the end, but it was not possible to drill the Eleuthera site because there were not enough pipes on board.

There is also a need for guidelines for hydrocarbon monitoring.

Leg 104 - Norwegian leg

Co-chiefs: O. Eldholm - J. Thiede

The drilling programs is the following:

- 1.- 2B to reflector K, with double HPC, reentry, logging, 200-300 m into basement (about 24 days for 1000 m penetration).
- 2.- 2A into dipping reflectors, with single HPC, reentry, logging (about 23 days for 1000 m penetration).
- 3.- 4, single HPC, drilling to no reentry, logging, 1000 m penetration, may be cut to 300 m if necessary.
- 4.- 5, single HPC, drilling as deep as safety permits. 150 m is enough for paleoenvironment.

Leg 104 will include heat flow measurement, oriented cores, and one vertical seismic profile (1 day) probably on 2A.

P. Robinson recommends 2A for VSP.

MARK

P. Robinson commented on the "Natural Laboratories" in the Pacific and in the Atlantic selected by the Lithosphere Panel for the drilling program.

Two areas were possible in the Atlantic: Kane F-Z and Famous-Kane Won out.

The 2 proposals on Kane by Karson et al., and Bryan et al., were not yet completely discussed by the Lithosphere Panel.

1st priority would be drilling on MAR, the nodal basin being the back up site. A great complexity is expected. The philosophy is to concentrate efforts on few holes.

Two legs are scheduled. The first will be short: set ~~#~~ 1 core, try bare rock drilling, if fails set core ~~#~~ 2 to be ready for the 2nd leg.

J. Mutter emphasizes that knowledge on F-Z is minimum, it must be investigated. How the crust looks like in a F-Z?

There are two goals: bare rock drilling, and improve drilling technique for recovery. J. Mutter: the Lithosphere Panel does not care with "hot spots" in the Atlantic. P. Robinson: there is no good strategy for the moment. The panel is interested but for the future.

Leg 105 - Labrador Sea

The co-chiefs are Shrivastava and M. Arthur.

Jansa: it is a 60 days leg with one site in Baffin Bay BB3, there a short site LA9, LA5 for later leg.

J. Baldauf:

Results of co-chiefs meeting with Garrison last week : BB3b, LA5, LA9, LA2 objectives may be shorter depending on time available.

Transit 7,5 days

<u>Plan A:</u>	go to LA5 - 200 m set come	(4,5 d)
	go to BB3b	(3,5 d)
	BB3b - reentry - penetration 1600-1700 m	(25 d)
	go to LA5	(3,5 d)
	LA5 finish	(13 d)
	Transit	(3 d)

<u>Plan B:</u>	as A, then from BB3b to LA2a	(3,5 d)
	LA2a - HPC	(2,5 d)
	LA2a to LA9	(2 d)
	LA9	(10 d)
	transit to St John	(1,5 d)

<u>Plan C:</u>	if ice , not cleared in BB	
	LA5 set come	(4,5 d)
	drill to basement	(20 d)
	LA5 to LA 2A	(1 d)
	LA 2A	(10 d)
	LA 2A to LA9	(2 d)
	LA 9	(13,5 d)
	Transit	(1,5 d)

Plan D: like A but drill LA5, waiting for BB.

Thiede: may be BB drilling will give data limited to the area?

SOHP recommended BB (1500 m coring) then LA 5, the main target being Paleogene paleoceanography.

A back up plan would be LA5, LA9, LA 2A.

Plan E: it is a recent option from a memo from the co-chiefs to Larson.

New site LA5A, which is a compromise between LA5 and LA9, located 27 km NE of LA5, water depth 3450 m, penetration to R2 would be 650 m (7,5 d).

Then BB3 and LA9.

Recommendations

ARP believes that Neogene and Paleogene paleoceanographic records should be major objectives at the leg 106 Baffin Bay and Labrador sea sites. Furthermore, the Baffin Bay site is sufficiently unique that, if conditions permit, time at this site should be extended and drilling should be continued as deep as possible even if this reduces time available for the Labrador Sea sites. Conversely, if weather precludes work in Baffin Bay, then drilling at Site LA5 should be done to basement to ensure that Neogene and Paleogene objectives are attained.

Leg 108 - NW Africa

W. Ruddiman: leg 108 program is an extension of piston coring findings.

11 sites with double HPC are scheduled mostly to middle to lower Miocene, one to Upper Eocene on Sierra Leone Rise. To the North, upwelling along W Africa responds to glacial history; to the South at the Equator variations seem to follow 23 000 years cycles. There are 2 different signals, how are they evolving in the past?

Drilling will allow to test various hypothesis by studying sea surface temperature and aridity changes (glacial? 23000 y cycles?), movements of the thermal Equator, $\delta^{13}C$ variations with glacial history...

A discussion arose on the geophysical background of these sites. To the North, sites are well linked with existing seismic data. To the South seismic profiles should be done this year by Polar Stern.

If time available some of the holes could be deepened.

L. Montadert read a letter from german scientists (Dr. Weissman) protesting against the abandonment of site MAV 1. W. Ruddiman: site MAV 1 is interesting but of lower priority. The black shales problem should be attacked when Joides Resolution will come back in the Atlantic.

Yucatan basin

Rosencrantz, a proponent for drilling Yucatan basin exposed his views on the geology of Yucatan Basin.

The Caribbean is a laboratory for studying strike slip tectonics.

He presented a basement geology map with the oceanic crust and the thinned continental crust.

Yucatan basin would be a precursor of the Cayman basin. The age of the basin which was considered as Paleocene is now Middle Eocene. It postdates the closure of Cuba. The thin continental crust in the North is believed to be an old piece of displaced continental margin, while in the South it should be Cretaceous arc volcanic sequences.

This rifted continental crust should have been the back arc part of the Caribbean arc during Cretaceous.

2 sites are necessary:

The panel emphasize again that Yucatan drilling must be a part of a suite of drillings in the Caribbean basins. An up to date proposal must be prepared with the help of Klitgord.

Discussion on future drilling in the Atlantic

L. Montadert: it is the first time we can have a general discussion on future drilling in the Atlantic. The Atlantic being the first ocean drilled during ODP, we have been very busy until now with the present drilling program. There will be a several years gap before the next drilling round in the Atlantic, but if one take in account the regional geophysical studies and specific site surveys which will be necessary, we must begin to prepare a new program. Workshops are a good mean to prepare this future and involve a large scientific community. The South Atlantic, a somewhat forgotten part of the Atlantic, seems to me one of the first objective for a workshop.

K. Klitgord: we need deep holes but limited sites of regional significance.

There is a gap of drilling data between Equator and Rio Grande.

Convection between N and S Atlantic

- we need a series of workshops not one
- the black shales problem
- early history of the S. Atlantic, Cretaceous to Paleogene
- connection with Pacific
- new reconstructions will come soon from satellite data.

B. Tuholke:

- Paleoceanography: early oligocene event on continental margins
- gate ways between N and S Atlantic
- Paleogene abyssal circulations: development of hiatuses. There are few sites typical of basins.

J. Thiede: - N. Atlantic paleoenvironment: North hemisphere glaciation. AWG of CMG is studying arctic drilling.

Late Cretaceous diatomites and black shales have been cored on Alpha Ridge. The ship could go to Fram Strait and even further North.

- impact of land masses history on the deep basins: Amazon, Congo, Niger histories. Change of drainage pattern through time.

- old paleoenvironment: Morocco

- Bahamas

- Iceland Faroe ridge linked to hot spot.

A. Bally: - complete sedimentary sequence

- South Atlantic: structural geology of F.Z. (compression, distension)

- Need for geophysical surveys. Problems with surrounding countries as a consequence of the law of the Sea. Can they be involved in ODP? (through the would bank, member of ODP as representative of developing countries?)

- Mediterranean and Caribbean workshops

- New targets : drilling volcanoes, F-Z carbonate accretion wedge: Puerto Rico, Mexican side of the Gulf of Mexico.

J. Austin: - Tethyan connections, with representative deep basinal holes.

- conjugate margins.

- 5 years is short to prepare geophysical surveys. Need workshop not too late. Workshop in Brazil?

J. Mutter: There are new thinkings on accretion at MAR (Purdy, Dietrich, etc.) New data on oceanic crust from seismic reflection show a continuous internal reflector where the ocean crust is thick, with a 6 km/sec layer below. Does not exist when the crust is thin. Thin crust under F-Z, not linked with offset of F-Z. What is this layer? The reflector could be the boundary between crystallisation and accumulation in magma chamber. Future drilling in FZ is particularly interesting.

- L. Jansa: - Need complete sections
- Paleocirculation: seaways Pacific, Tethys, Morocco deep hole,
 - Conjugate margin of Galicia
 - S. Atlantic: black shales in N and S Atlantic.
 - diapiric zones of Angola
 - Agulhas plateau

- P. Meyers: - comments the SOHP ideas:
- geochemical cycles
 - upwelling
 - connections - exchanges
 - physical oceanography
 - oceanic biosphere
 - diagenesis
 - ocean - continent interactions.

These comments brought a discussion on P. Vail curve. It needs to be globally checked and calibrated, but few seem interested. The method is used by some, criticised by others.

This theme must be developed, it was clearly exposed during COSOD but not followed.

- P. Robinson: - the Lithosphere Panel has 4 major goals:
- crustal structure and process of accretion
 - transform fractures
 - nature of hot spots, mantle heterogeneity
 - origin of volcanoes, intraplate volcanism

Combination of land and sea studies is recommended like in Cyprus. Mark will attack the 2 first points.

Alteration of Oceanic Crust is also a goal.

Discussion on workshops

Regional panels can have long term views because they have not to continuously react to new proposals.

Within the next few years, ARP will promote workshops. The first one will be devoted to the South Atlantic.

The workshop is proposed for spring 1986 at Virgin Islands or Miami.

Co-convenors could be J. Austin, D. Hayes, J.C. Sibuet.

J. Austin would be the representative of ARP.

Main topics:

- . Age and paleoenvironment of the rift system
- . Kinematics of opening
- . Connection with the N. Atlantic
- . Connection with the Southern Seas.
- . Aseismic ridges
- . Volcanism associated with rifting
- . Fans: congo, Amazon, etc.
- . Shear margins of the Equatorial zones and Falkland, Agulhas
- . Neogene paleoceanography.

J. Austin will write a statement about the S. Atlantic workshop. ARP members must send to him names of appropriate persons as participants to the workshop with their discipline.

The workshop should be promoted in common with the Southern Ocean Panel and SOHP. J. Austin will call J. Kennett, and P. Meyers will call M. Arthur.

D. Buffler report on P. COM meeting

Chile triple junction is not likely to be drilled, because there is no site survey yet. Other leg in the Pacific probably up to date on Yucatan.

PCOM needs Barbados north drilling plan. ARP must propose co-chiefs for future legs.

ARP proposal for barbados leg co-chiefs: Casey Moore and Alain Mascle. ARP proposal for Mediterranean leg: Thunnel, Jean Mascle, Cita, Ryan, Kastens, Rehaut.

Question for J. Mascle: are special equipments needed for Med drilling?

Possible new members

If O. Eldholm, Witmarsh, Schlager must be replaced, ARP proposed:

Petrography 1. - J. Karson, J. Honnorez - Fox

Stratigraphy 2. - P. Vail

Sedimentology 3. - P. Enos, Normark, Bernoulli, Mutti

4. - R. Kowsmann (Petrobras)

Next meeting

16-21 september in Europe or at Woods Hole.

First order of business is to prioritize Mediterranean sites.