OCEAN DRILLING PROGRAM

SITE SURVEY PANEL MINUTES

SCRIPPS INSTITUTE OF OCEANOGRAPHY

LA JOLLA, CALIFORNIA

28-30 NOVEMBER, 1984

Present:
*John Jones (U.K., SSP Chairman)
*John Peirce (Canada)
Carl Brenner (IPOD Data Bank)
*John Orcutt (U.S.)
Tony Mayer (ODP)
Phil Robinowitz (ODP)
Gary Brass (NSF)
Roger Larson (ODP, PCOM Chairman)
*Kim Wong (Germany)
*Alain Mauffret (France)
*Renzo Sartori (ESF)
Jack Clotworthy (JOI)

Guests:
Matt Salisbury (Observer)
George Claypool (arrived Wed. PM)
Jim Kennett (S. Oceans, Thursday)
Jim Natland (W. Pacific, Wednesday)
Bob Detrich (Kane FZ, Fri. AM)
Don Heinrichs (NSF, observer)

* Members, SSP.

1. INTRODUCTIONS

2. REVIEW OF AGENDA

3. REPORT FROM PCOM CHAIRMAN (ROGER LARSON)

Emphasis on importance of weather window.

101	22 Jan.	Ft. Lauderdale	Bahamas
102	09 March	Ft. Lauderdale	Downhole Measurements
103	30 April	Norfolk	Galicia Bank
104	03 July	Bremerhavn	Norwegian Sea
105	24 Aug.	Stavanger	Labrador Sea / Baffin Bay
	20 Oct.	St. John's	

No slack in schedule; already pushing weather window.

106		MARK I
107		Tyrrenhian Sea
108		NW Africa (Cenozoic)
109}		Mark II
110}		Barbados North (either order)
111		E. Pacific Rise 13oN
112		Peru Trench
113		Chile Triple Junction
114	Jan. 1987	Weddell Sea

Biggest technical problem is base rock drilling. Political clearances are always an uncertainty. Prime alternatives.
Yucatan Basin
Deep Mesozoic, NW Africa
504B E.P.R.

Next PCOM meeting is 8-11 January, 1985, in Austin, Tx. R.L. needs site survey input to that meeting in order to set up schedule for Indian Ocean.

4. REPORT BY SCIENCE OPERATOR (PHIL ROBINOWITZ)

ODP Organization

Ship Facilities - new ship designation is RESOLUTION 50 in scientific party. Each member country, 2 people per leg and 1 co-chief/year.

Underway Geophysics

A. 2 80 cubic inches water guns — Echo Sounders
1 400 cubic inches water gun — GPS intended
1 120/360 cubic inches air gun — Magnetometer
3 5 to 60 cubic inches air guns

B. 561 Masscomp Super micro
15" wide Printronix high res. graphic printer
(160 dots per inch)
22" Versatec printer 200 dots/inch

C. Display Flexibility
Filtering and gain control options.
Processing such as trace mixing, decon, migration.

MOTION J.O./K.W.

Investigate possibility to have GPS on board for MARK I Leg.

Discussion: Needed for positioning within 50 m in order to tie into Sea Beam survey. Valuable experience leading up to purchase.

Ship shakedown cruise in January. Will drill a couple of JOIDES approval sites.

5. CHILE TRIPLE JUNCTION

Two U.S. proposals were rejected.

Sites are along at 45 degrees S and 46 degrees S, just north and south of T.J.

Northern transect is old LDGO 5 CS.

On shelf itself there is ENAP MCS.

There is a bottom simulating reflector 200-300 m landmark of trench.

Previously, when BSR present, requirements have been for SCS, MCS, and heat flow.

J.J. reviewed data and make recommendations on behalf of panel (attached as Appendix A).

T.M. After U.S. proposals, some French possibilities were open with Charcot.

A.M. There is a proposal for Charcot for February 1986. Seabeam, high resolution SCS, magnetics, gravity.

Weather window is November 1985-February 1986. The French are waiting for an American decision on an MCS proposal. If Steve Cande submits promptly and reviewers cooperate, four months for NSF review.

Heat Flow needed and would be more logistically feasible on Charcot than on MCS survey.

MOTION

The SSP recognizes the scientific value of the proposed leg for the Chile triple junction. However, in view of the inadequate site survey data in that area, the SSP recommends that the sites not be drilled unless the first four requirements in the telex of J. Jones to R. Larson, dated 21 November 84 (Appendix A), are met. Additionally, during the MCS survey, Sonobuoys should be deployed to maximize the velocity information available to determine the depth to the observed BSR. The proposed program is not scientifically viable without them. These sites must be surveyed no later than the end of March, 1986.

Unanimous agreement.

A.M. emphasized the desirability of coordinating an MCS survey with the proposed Charcot survey.

If the unsolicited proposal being prepared by Steve Cande is not funded, the Chile T.J. leg will probably be dropped.

6. PERU TRENCH (A.M.)

French are proposing a Charcot survey in conjunction with Chile T.J. using the same equipment. 20 days survey time for 5 areas. Program is definitely scheduled.

Hussong is planning as MCS survey in March 1985 with some Seamarc. U.S. cruise is in response to an RFP.

7. EAST PACIFIC RISE

There is a lot of data but much of it has not been synthesized.

French data is not yet available. The diving program would be particularly useful.

Deep geophysics in area of 504B will be surveyed in spring 1985.

8. SITE SURVEY NEEDS WHERE CLATHRATES EXIST

The Chairman introduced George Claypool, Chairman of Safety Panel, and asked him to say some words about that panel's attitude towards clathrates and BSR's.

The concern is that clathrates can form an impervious layer which could trap gas. Since there clearly is a source for gas, it has always been a concern.

Heat flow data is not directly considered by the safety panel because it is difficult to use them effectively in evaluating risk.

Need good velocities to determine the depth to clathrate layer and bright spot analysis. Depths in meters not seconds are essential.

9. W. PACIFIC (JIM NATLAND)

General review of proposals received. No priorities to date.

One proposal was to place a set of three "laboratories" in back-arc, arc, and fore-arc environments.

Sunda arc encompasses oblique convergence (Sumatra), orthogonal convergence (Java), orthogonal continental collision, and oblique continental collision.

Does plateau collision have a temporal relationship to polarity reversals of arcs in the Solomons and the New Hebrides?

In the Lau Basin there is MCS evidence for a possible magma chamber.

J.N. has a list of cruises currently planned in '85-'87.

There is plentiful data in the area, but most objectives being considered will require more advanced survey experiments.

There was considerable discussion about how to best organize site survey efforts in the absence of a set of proposals or a list of priorities. One suggestion was to have a SSP rep on the W. Pacific Panel. **J. Jones will follow this up with Silver.**

10. INDIAN OCEAN PANEL REPORT (J. PEIRCE)

Kerguelen considered very important by Indian Ocean Panel because it is the one place where a N/S transect of shallow Antarctic cores can be recovered. Tectonically it represents a key piece in the puzzle. The Panel strongly recommended devoting two legs of drilling to it. PCOM's reaction will probably be only 1 leg according to RL.

Virtually all sites need site surveys.

Top priority areas are listed below in no particular order.

- Agulhas Plateau: A priority for paleoenvironments in view of limits to AABW circulation.

- W. Somali Basin: A priority Mesozoic site (M12).

- Red Sea: J. Cochran chairing Working Group.

- Makran: Relatively undeformed accreting wedge; can be tied to onshore geology; folds still open. Thematic problem - compare to other wedges.

- Arabian Sea: Monsoonal upwelling A priority. Also high priority with SOHP.

  Oman margin. 02 min layer intersects margin.

  Indus Fan. Distal sites to correlate sedimentation with Siwaliks.

  Weather window: Avoid June-August.

  - Aseismic Ridges (90 East, Chagos-Laccadive).

    Carbonate recovery at a variety of latitudes. Tectonics and geochem of N/S hotspot trace. E/W transect for dissolution independent of productivity variations.

  - Central Indian Ocean/Bengal Fan

    Study intraplate deformation.

  - SE Indian Ocean

Combine PE and geochemical transects and hydrothermal history.

- Broken Ridge - a possibility if tectonic objectives not reached at Kergeulen.

- Triple Junction - bare-rock drilling at R.J. Side scan sonar is needed; all else is done.

- NW Australia - Jurassic starved margin. Very high level of support.

- Eastern South Australia - Starved margin. Subsidence studies. Option if ship goes out of Indian Ocean this way.

A list of I.O. proposals and survey status is attached as Appendix B.

Navy data (Wilkes sparker) resides in data bank. LDGO has digitized TWT to basement for Indian Ocean. South Africa has been contacted for data.

Next I.O. Panel meeting in December. C.B. will attend for the SSP.

11. WORKING GROUPS

The concept and viability of the Working Groups proposed at the last SSP was discussed.

MOTION JP/JO

The SSP should send representatives to the SO, IO, & WP RP meetings until the site survey need is met in those areas. This replaces the Working Group concept discussed in Zurich.

Unanimous agreement.

There is a need to distribute the site survey requirements matrix soon. Tony Mayer will do this in a special issue of JOIDES Journal.

12. LABRADOR SEA (J.P.)

The various limitations due to drilling time (two weeks longer than normal leg) and ice were discussed. A support vessel will probably be needed (or required ?) for ice recon.

The seismic MCS data at site BB3 (line BE 54-71, SP 511) were discussed, including the migrated section just completed by Petro-Canada. The structure landward of site appears as

tilted fault blocks, but possibly could be a huge slumping instead.

Claypool emphasized that safety clearance was only given to a relatively shallow depth at preliminary meeting.

More magnetic data would help resolve this uncertainty. No other site survey work can be accomplished in advance of drilling. SSP agreed that no more was necessary.

The site survey data (high res water gun/air gun, gravity, mag, heat flow, and coring) were reviewed.

LA-9 (new site description attached as Appendix C). Small diapiric (?) structure of uncertain origin occur just south of site, but not at the site.

LA-5 Velocities of MCS indicate depth of 1430-1490 m to basement. Sonobuoy has problems with ship's peed being variable.

LA-2 Site rejected as shallow section very contorted due to slumping or WBUC activity. This had not been seen on MCS seismic.

13. SOUTHERN OCEANS (JIM KENNETT)

Map of sites in Atlantic and Weddell Sea attached as Appendix D (Kristofferson)

- Weddell Sea

  There will be a Norwegian survey MCS, etc. in the Maud Rise area this season. At least one day per site.

  W4 - will be surveyed by Karl Hinz in 85-86. 50-60 days of ship time available. Survey will include Seabeam, MCS, G/M, coring, heat flow.

  W5 to W8 Peter Barker surveying this summer.

  W9 (Powell Basin) low prioritiy; will not be surveyed further.

  W10 (Bramsfield St.) No plans for further site survey. Shallow, late Neogene, high resolution paleo-oceanography and high heat flow geochemistry. There is a possibility that von Herzen will be doing work there.

  W11 Simple stratigraphy. No further information needed.

  John Anderson will be going in S. Orkney Basin on Glacier. SCS and coring.

- Sub-Antarctic Sites

SA 1,2,3

Part of a N/S traverse including sites 513 adn 514.

SA 4

Behind arc. Tectonic objective, but not strongly backed. Will be surveyed further by Barker.

SA 5/6

NE Georgia and Isla Orcados Rises. Fill in missing sections from Falklands.

SA 7/8

Conjugate sites on eastern side of basin. Older Lake K. circulation patterns.

John LaBreque has submitted a proposal for site survey for all sites except SA 4. Seabeam, watergun, piston cores.

Need a special site survey cruise to optimize the science.

All single bit and HPC/XCB.

Kerguelen

Very high quality French MCS data on N. Kerguelen S. Kerguelen data is only old Eltanin data.

Marion Defresne will probably be in S. Kerguelen with 20 days MCS and 20 days coring and dredging in spring '86.

Australia (Falvey) will have a spring '85 survey, but area uncertain.

Prydz Bay (Antarctic) margin is a transect of four sites hoping to get to Jurassic. Some Australian MCS data exists.

There was discussion regarding how critical it is that all site survey data, especially Kerguelen, be available for review in the IPOD data bank.

MOTION JP/JO

The SSP considers that additional high resolution seismic data is critically necessary to optimize the site selection on the Sub Antarctic Leg in the South Atlantic.

Every effort should be made to use ships of opportunity for this purpose.

Passed unanimously.

14. MEDITERRANEAN (R.S.)

Only Tyrrhenian Sea seems likely to be drilled in the immediate future. A revised proposal (Sept. '84), including recent diving results, has been submitted.

There is a French proposal (Mascle and Bija-Duval) to go to the 8 sites with MCS etc. in Spring, 1985. The MCS would be acquired by IFP.

There will be one month per year of IFP MCS on an IFREMER boat devoted to ODP surveys.

Further reveiw of this area will be primarily by the Safety Panel.

15. KANE FRACTURE ZONE (J.O.)

Initial Seabeam phase done by Conrad in Sept. '85. Track spacing covered entire fracture zone and 100 km to south.

Sea Marc I was lost in early November. The chirp sonar was lost as well. Probability is that a commercial Sea Marc I may be leased.

SAR is a new French side scan instrument and may be available. It is not available in January.

Bob Detrich joined the discussions Friday A.M. and discussed the options being considered by the site survey P.I.'s (see Appendix J). Clearly the situation is still very fluid. Option 3 is preferred by Detrich because it would be relatively cheaper and allow use of a chirp sonar, but using new equipment for the first time in a critical survey is always risky.

There is tentative agreement from BIO for a 31 May - 20 June slot on the Hudson ship schedule.

Short turnaround time to drilling was not considered to be a problem.

Another option would be to do photography only in January and do side scan later after drilling.

****MOTION**** RS/KW

The SSP requires that near bottom side scan data be acquired for choosing bare rock drill sites in the Kane Fracture Zone.

Passed unanimously.

16. MOVEMENTS OF RESEARCH VESSELS 1984-86

F.G.R.

See Appendix E-1 for table listing relevant to the drilling program. Projects to be undertaken by German vessels during the 1984-86 period.

France

See Appendix E-2

ESF

See Appendix E-3

U.K.

See Appendix E-4

U.S.

See Appendix E-5

Canada

See Appendix E-6

17. IPOD Data Bank (Roger Larson)

Historically the Data Bank operated a co-mingled funds until 1979. Since then it has operated on U.S. funds.

As of summer '84, EXCOM approved co-mingled funding at a level of $200K/year.

PCOM has asked for a review of data bank. Kim Klitgord will chair panel, A. Mayer will be executive secretary.

Terms of reference were discussed, but aren't final (and therefore aren't attached).

Most requests are LDGO/TAMU. There is a feeling that most are not JOIDES related.

Review of surveys. Possibility of TAMU staff scientist serving as the detailed reviewer.

Should a LDGO provide input data quality control?

SS-SP members should review in detail the existing data for a detailed proposal for drilling.

Alain Mauffret and John Peirce suggested as members of review panel.

The SSP expresses the following as formal suggestions:

- The Data Bank should stay at LDGO under the present financial arrangements.
- QC of incoming data should be done by Lamont as data arrives. The SSP recognizes that there is little more that can be done post-cruise than to insure that data sets are complete.
- Assessing the adequacy of site survey data for drilling is the job of the SSP. A member of SSP should be designated to review data packages for each mature drilling proposal.
- PCOM must enforce the SSP review of drilling proposals.
- Data Bank resources and policies should be advertised more widely.
- Saftety Panel and SSp members should be on the panel reviewing the IPOD Data Bank.

18. DATA TAPES RELATED TO SITE SURVEYS

Legett will try to reprocess some data related to previous MCS data. John Jones will write to him to encourage such work with ENA-3 and Fred Moore data in Carribbean.

No data tapes, except old Digicon line near 418A, are at data bank.

19. SITE SURVEY STANDARDS

The grid produced in Zurich was discussed and modified. The revised version is attached as Appendix G.

20. REVISED MANDATE FOR SSP

Discussed and revised as attached (Appendix H).

21. SITE SURVEYS COMPLETION USING DRILL VESSEL AS A PLATFORM

K.W. submitted Weigel's ideas, attached as Appendix I. Reflection seismic - Borehole VSP will be available.

Seismic refraction using a launch for a sound source. Position of launch determined when on site. No launch currently planned. Could be used for oblique shooting during VSP.

Magnetometer - possibility of MT measurements.

Gravity meter - Use drill sites as gravity base stations.

These ideas should be put to TEDCOM and Science Operator. **(Action item for J.J.)**

22. SITE SURVEYS FOR RISER DRILLING

Earliest time for riser drilling is probably 1991.

PCOM needs to follow this up and identify lead time.

23. NEXT MEETING

PCOM meetings are scheduled for early January, mid-April (Norfolk), and June (Hanover).

Ind. O. meetings are in December and June.

South O. meeting is in April.

SSP meeting will be in Bologna or at LDGO in late May.

A tentative agenda is attached as Appendix J.

24. DATA PACKAGES TO BE REVIEWED (ACTION: CARL BRENNER, SEND; PANEL MEMBERS REVIEW).

Peru - Chile Trench	Alain Mauffret
East Pacific Rise	John Orcutt
Sub Antarctic, Atlantic	Kim Wong or Wiegel
Weddell Sea	John Jones
{erguelen	Alain Mauffret

odp
sk

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APPENDIX A

November 21 1984.

Telex: Mailbox 470

To R. Larson: JOIDES office

Re Chile Triple Junction Site Surveys

Based on data package received earlier this month I make the following recommendations for site surveys.

1. Each candidate location must be at the intersection of two multichannel seismic cross lines

2. Sites along A-A^1 (45°S) and B-B^1 (46°S) must be linked to regional structure by two long multichannel profiles extending from outer shelf to 76°25'W

3. Presence of bottom simulating reflector requires each site to be surveyed using high resolution seismic (water gun : 3·5 kHz) and heat flow. Sufficiently high seismic resolution can be achieved if water gun is used for (1) above.

4. Topographic complications require that regional bathymetry be surveyed with seabeam and/or seamarc and/or GLORIA

5. Survey vessel should leave down long-life bottom transponders for precise location of drill sites.

Please retransmit to JOI and Lamont Data Bank.

E. J. W. Jones

Chairman, Site Survey Panel

TABLE 2 APPENDIX B Page 1 INDIAN OCEAN PROPOSALS

"Super-Proposal"	Proposals	Thematic Panels?	Priority	Panel Watchdog	Survey Status R=regional S=site	Site Days	Notes
Agulhas Plateau 1/	6,36,53	S	[redacted]	Herb	R=ok, S=needed	9	1st site
		T	B			9	2nd site
SW Indian Ridge (L-4)	26	L	C	Honnorez	R=ok, S=needed	1 leg	Refer to L Panel
Crozet Basin	29	S and PCoM	C	Honnorez	R=ok, S=needed	?	Seismic Obs to
Crozet Plateau	27,59	TS	C	Honnorez	R=ok, S=needed	?	
Davie Ridge	62	TS	B	Cochran	R=ok, S=ok?	?	2 sites
			C		Clearance?	?	3rd site
N. Madagascar Rift Margin	17,40	TS	C	Cochran	"	?	
W. Somali Basin 2/	13,17, 40,41	TS	[redacted]	Cochran	R-ok, S=needed	20	
Seychelles	19	T	C	—	R=ok, S=needed	?	
Amirante Ridge + Trough	19	T	C	—	"	?	
Mascarene Basin Fossil Ridge	—	L	—	Schlick	"	1 leg	Schlick to propose
Rodriguez Triple Junction 11/	55	L	B	Schlick	R-ok, S=ok? No	1 leg	

TABLE 2

"Super-Proposal"		Proposals	Thematic Panels	Priority	Panel watchdog	Survey Status	Site Days	Notes
N. Somali Basin		21, 42	TS	C	Brenner	R=ok, S=needed	>1 leg	
Owen F.Z.		42	T	C	Brenner	"	1 leg	
Gulf of Aden		15, 42	TL	C	Cochran	R=ok?, S=needed	1 leg	
Red Sea	3/	7, 16, 23, 52, 56	TSL	[redacted]	Cochran	R=ok, S=needed? S=funded+planned	1 leg	Red Sea L
Makran	4/	8	TS	[redacted]	White, Lagsett	R=ok, S=funded and planned	30-45	
Owen Ridge	5/	30, 31	TS	[redacted]	Prell	R=fair, S=needed	15	
Oman Margin	5/	33, 43	S			R=poor, S=needed		
Indus Fan (upper)		18, 20, 33, 61	TS	C	Prell	R=ok, S=needed	—	
Indus Fan (lower)	5/			[redacted]		R=fair, S=needed	15	
Chagos-Laccadive Ridge + Mascarene Plateau	6/	25, 34	TSL	[redacted] 15/	Falvey	R=very poor	28	Informal w.G.
Central Indian Ridge		24, 61	TL	C	—	R=ok?, S=needed	—	Refer To L
Kerguelen-Gaussberg Ridge + Plateau	12	57, 58	TSL	[redacted]	Schlich Falvey	R=ok, S=funded+scheduled	1½ less	SORP operator

"Super-Proposal"	Proposals	Thematic Panels	Priority	Panel Watchdog	Survey Status	Site Days	Notes
Central Indian Basin 7/	9, 44	TS	[redacted]	Curray	R=ok, S=needed	45	Combine Objectives
Bengal Fan, lower 7/	33	TS					
Ninetyeast Ridge	25, 34, 35, 45	TSL	B? 15/	Curray	"	< 1 leg	Informed W.G.
Broken Ridge	49	TSL	B ?	Curray	R=poor, needed	20 ?	
SE Indian Ridge Transect 8/	37, 38	SL	[redacted]	Curray	R=ok, S=needed	25	
Wharton Basin	35	S	C	von Rad+Falvey	R=ok?, S=needed	—	
NW Australian Margin 9/	6, 12, 63	TS	[redacted]	von Rad+Falvey	R=ok, [redacted]	39	
Argo Abyssal Plain 9/	12	TS	[redacted]				
Wallaby Plateau	12, 63	TL	B				
S. Australian Margin, E. part 10/	12	TS	[redacted]	Falvey	R=ok, [redacted]	1 leg	
S. Australian Margin, Central	48	TS	C	"	R=ok, S=needed	—	
Andaman Sea	10	T	C	Curray	R=ok, S=needed	—	Clearance
Sunda Arc, Sumatra+Java	46	T	C	Curray	R=ok, S=needed	—	Alt. to Makran
Sw Strait	11	T		Curray	R=ok, S=needed	-	
Timor	47	T	C	—			Refer to

Footnotes

0/ Thematic Panels: S = SOHP ; T = TECP, L = LITHP

1/ - 11/ See descriptions in the Appendix

12/ See SORP Minutes and report for meeting 3-5 Sept 1984

13/ Formal Red Sea Working Group requested

14/ Informal W.G. will evaluate Chagos-Laccadive vs. Mindy east Ridges, including Curray, Peirce, Herb, Falvey, Duncan, Prell, and Brenner.

APPENDIX C

Site LA-9

Latitude: 53° 19.2'N
Longitude: 45°14. 4'W
Water depth: 3867 m (corrected)
Distance: 450 km from both Greenland and Canada
Jurisdiction: International

GENERAL LOCATION AND GEOMORPHOLOGIC SETTING:

Southern Central Labrador Sea, southwest of Gloria Drift and northeast of NAMOC spillover turbidites. Located near anomaly 24 southwest of the Labrador Sea triple junction.

WHAT GEOPHYSICAL AND GEOLOGICAL DATA WERE USED FOR SITE SELECTION?

Located on HD84-030, line 4, 1545Z on Day 215. This profile is representative of a number of single channel profiles which lie in the vicinity of this site. Line 8 which crosses line 4 lies slightly to the west of the chosen site. The site is offset about 22 km from crossing (line 8, 0700Z, day 217) to provide ut 50 ms more sediment than at the crossing.

WHAT IS THE CHARACTER OF BASEMENT AT THE SITE?

Hummocky oceanic crust (Srivastava, 1978/Srivastava et al, 1981)

WHAT IS THE MAGNETIC ANOMALY AT THE SITE?

Anomaly 24 or slightly older (Srivastava 1978, Srivastava et al, 1981)

PROPOSED TOTAL PENETRATION:

800 msec (2 way time) - 850 m including 50 m into basement

PROBABLE SEDIMENT THICKNESS:

800 msec (2 way time) - 800 m

PREDICTED STRATIGRAPHY:

Pleistocene to Mid Miocene (Reflector R2) - 0.13 sec. two way travel time (120 m); mid Miocene to Mid Oligocene (Reflector R3) - .19 sec. (170 m); mid Oligocene to Mid Eocene (?) - .28 sec. (290 m); Mid Eocene to Basement (late Paleocene?) - .2 sec. (210 m).

WHAT LITHOLOGIES ARE EXPECTED?

Hemipelagic Pleistocene silts and muds. Pelagic-hemipelagic Mio-Pliocene mud, Oligocene to lower Pliocene nanofossil clays and silts and silty oozes probably siliceous in the Oligocene - lower (Middle?) Miocene; Eocene nanofossil clays.

IN WHAT PALEOENVIRONMENTAL SETTING WERE THE SEDIMENTS DEPOSITED?

(Similar to Site DSDP 112)
Hemipelagic muds with contourites (Plio-Pleistocene);
Contourite (Oligocene to lower Pliocene); pelagic clays (Eocene).

ESTIMATED AVERAGE SEDIMENTATION RATE:

1.5 cm/1000 yr.

WHAT STRUCTURAL ELEMENTS ARE PRESENT:

None related to hydrocarbon potential; no pinching of sediment reflector or major unconformities; small undulation in the basement topography.

OPERATIONAL AND SAFETY CONSIDERATIONS:

No hydrocarbon occurrences at DSDP sites 111, 112, 113.

WHICH HYDROCARBON OCCURRENCES ARE KNOWN FROM COMMERCIAL DRILLING?

Some oil and gas finds in near to shallow marine Lower Cretaceous and Paleocene sands in Labrador Shelf wells; oil and gas window below 3 km sediment depth; trapping is structural.

I ERE ANY EVIDENCE FOR GAS HYDRATES AT THIS LOCATION?

Single channel seismic reflection data collected in this region show presence of diapiric structures in the top 0.2 sec of sediments about 10 km south of the site. The opaqueness of the sediments over and around these structures suggest that they may be shale diapirs (?). Heat flow mesurements near the site show normal values for crust 60 m.y. old.

IS THERE ANY REASON TO EXPECT HYDROCARBON ACCUMULATION AT THIS SITE?

No reason other than what is mentioned above. The site appears to be free of gas or hydrocarbons.

WHAT IS THE PROPOSED DRILLING?

Double HPC to 250 m, XCB to 450 m, Rotary drilling to basement or refusal. Continuous coring.

WHAT IS THE PROPOSED LOGGING PROGRAM?

Sonic and density logs and heatflow.

W SPECIAL PRECAUTIONS WILL BE TAKEN DURING DRILLING?

Normal, careful monitoring of pressure and hydrocarbons during drilling.

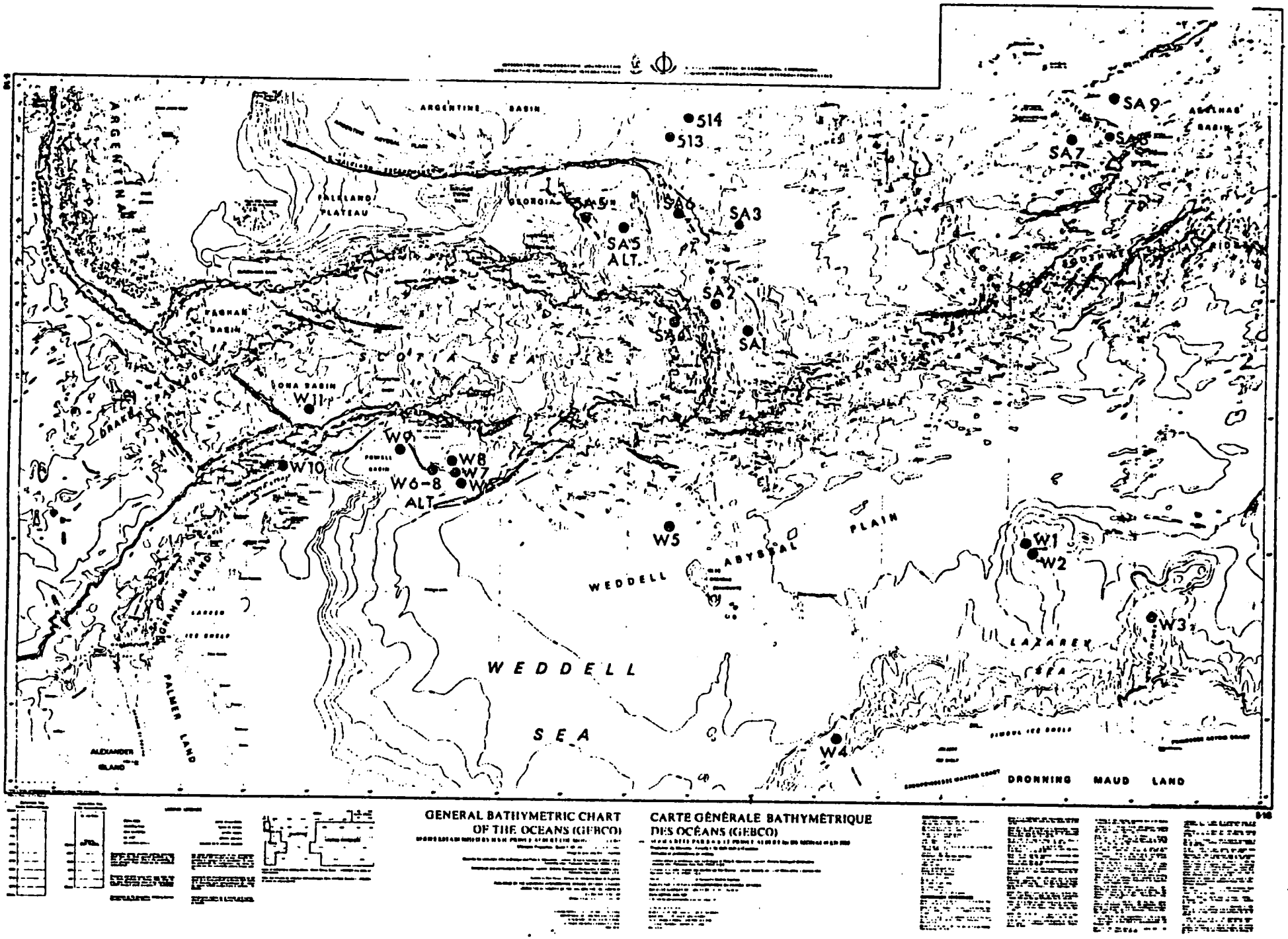
WHAT ABANDONMENT PROCEDURES DO YOU PLAN TO FOLLOW?

Normal, move to an alternate site

SUMMARY OF MAJOR RISKS:

South of the site, the seismic reflection records show presence of diapirs which may be shale diapirs. However, the site should be free of any gas or related substance and pose no hazard.

APPENDIX D


ARGENTINE BASIN
514
513
SA 9
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SA 7
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SA 3
SA 5
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SA 4
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W8
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W6
W6-8
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WEDDELL
SEA
PALMER LAND
DRONNING MAUD LAND
GENERAL BATHYMETRIC CHART
OF THE OCEANS (GEBCO)
CARTE GÉNÉRALE BATHYMÉTRIQUE
DES OCÉANS (GEBCO)

APPENDIX E-1

F.R.G.: Research Vessels

AREA	TIME	PROJECT	INVESTIGATORS
Norwegian Sea Profile Jan. Mayen - Greenland along 70 degrees N, Jan Mayen Ridge.	Polarstern 08/09-84	Surface sed. sampling refraction seismics, deep-towed vertical array dipping reflect-ors crustal seismic.	Kiel/Hamburg
Fram Strait, E of Greenland.	Polarstern 06/09-85	Reflection seismics refraction?	Kiel/HH
Weddell Sea	Polarstern 12/85 - 03/85	SCS seismic refraction water gun Sea Beam ocean/continent trans-ition tectonic evolu-tion.	BGR/HH
Arafura S. N. of Australia	Sonne 11/84 - 02/85	MCS	BGR
Java S.	Sonne, poss. 86.	Reflection seismics, grav/magnetics, coring structure, geol. vol-canic history.	Hamburg
Gulf of California	Sonne, poss. 86	Geophysics?	HH?
Ryukyu Trench	Sonne, 1984	Refraction (OBS) grav. mag.	HH/Hokkaido Un
	1985 Japanese ship?	Mainly reflection seismics.	HH/Hokkaido
Lord Howe Rise Tasman Plateau	02-05/85 Sonne	MCS, grav. mag. HF? No coring (BMR?)	BGR Australian BMR
S. China Sea	Sonne, 11/84.	MCS (additional lines from future drilling proposals) Problems quartz rifting.	BGR & LDGO (Hayes)
Ligurian Sea Sardinia - Tunisia	1984/85.	Reflection & refrac-tion grav. mag. refraction.	HH

APPENDIX E-2

FRANCE: Research Vessels

AREA	TIME	PROJECT	INVESTIGATORS
Japa Trench, Okinawa Trough, Maccana Strait	1984	Surveys in preparation for diving	
Maccassa Strait	1984	Heat flow, seismic	
East Pacific Rise	1984	Diving program	
Indian Ocean Triple Junction	1984	Sea Beam, sampling	
Bay of Biscay	1984	Deep reflection and refraction	
Gulf of Cadiz	1984	Sedimentological studies	
Ivory Coast Margin	1984	Coring	
Gulf of Tadjura	1984	Diving	
S. China Sea	1985	Sea Beam, water gun surveys to study early rifting	
Japan Trench	1985	Diving program	
Louisville Ridge	1985	Sea Beam, sampling	
Tonga-Kermadec Trench	1985	Sea Beam, water gun seismic	
Indus Cone	1985	Coring, high resolution seismic	
Red Sea	1985	Diving programme.	
Tyrrhenian Sea	1985	Seismic, sampling.	
Porcupine Bank	1985	Diving programme.	
Earlier Caribbean, off Puerto Rico, Hispaniola	1985	Coring, single channel seismic	
Chile Triple Junction	1986 (Feb.)	Sea Beam, sidescan (SAR), single channel seismic.	
Peru-Triple Trench	1986	Sea Beam, sidescan (SAR), single channel seismic.	
East Pacific Rise 9-10 degrees N.	1986	Hydrothermal studies.	
Easter Island Area	1986	Sea Beam	
Pitcairn Island Area	1986	Local geological study, seismicity.	
South Keuguelen	1986	Seismic.	

APPENDIX E-3

E.S.F. Research Vessels

AREA	TIME	PROJECT	INVESTIGATORS
Weddell Sea	1985	Regional geology, geophysics.	Norwegian Polar Institute
Norwegian Sea	1985	Norwegian margin; North of 60 deg. N.	Norway
Mediterranean, (Italian margin, Balearics)	1985	Multi-channel seismic, sampling.	Italy
Banda Arc	1985/86	Geology, Geophysics.	Holland

APPENDIX E-4

U.K. Research Vessels

AREA	SHIP	TIME	PROJECT	INVESTIGATORS
Great Meteor East (Atlantic)	Discovery	1983/84	Seismic profiling, sampling, GLORIA	T.Francis, P.Schulheis, R.Searle
Equatorial Atlantic	Shackleton	1983	Cape Varde apron; Geology and geophysics.	I.Hill
Equatorial Atlantic	Shackleton	1983	Gambia, Sierra Leone Basin, Geology and geophysics.	E.Jones
Equatorial Atlantic	Discovery	1983	Romarnhe F.Z. GLORIA, sampling	R.Searle
NE Atlantic	Challenge	1984	Rochall Trough, Geology and Geophysics.	R.Scrutton
NE Pacific	Farrella	1984	West Coast, U.S.A., EEZ. GLORIA study	USGS/IOS
E. Pacific	Submersible	1984	Perufivity survey 1 local area. East Pacific Rise. Relevant to Leg 111.	T.Francis conjunction w/ French workers
Weddell Sea	Discovery	1984/85	Regional geology and geophysics.	P.Barker
E. Lessor Antilles	Darwin	1985	Seismic, including 2-ship profiles.	G.Westbrook
E. Ionian Sea	Not known	1986	Seismic, sampling	M.Brooks, M.Collins
W. Mediteranean	Not known	1986	Seismic structure of western margin of Sardinia.	P. Barton
W. Atlantic	Not known	1986	Deep seismic survey of Nares Abyssal Plain.	R. Whitmarsh
Indus Cone	Not known	1986	Sampling, seismic, GLORIA.	N. Kengan
Makran	Not known	1986	Geological, geophysical study of accretionary prism.	R.White& J.Leggett
Indian Ocean Triple Junction	Not known	1986	Sampling study.	A. Baxter

Indian Ocean Triple Junction (...t known 1986 GLORIA(tudy. L.Parson, R.Searle

APPENDIX E-5

U.S.: Research Vessels

AREA	TIME	PROJECT	INVESTIGATORS
Kane Fracture Zone	1984	Site survey with Sea Beam, Sea Marc.	U.R.I./Bedford Institute.
Western Atlantic	1985	Seismic profiling.	M.Purdy/WHOI.
South Atlantic	1985	Sea Beam survey of Walvis Ridge and area to north.	G.Fox and others
S. of Kane Fracture Zone	1985	Seismic.	M.Purdy/Ballard, WHOI.
Marianas	1985	Sampling	
Peru/Chile Trench	1985	Site surveys.	HIG.
Panama Basin	1985	Seismic, sampling.	Univ. California
W.Pacific (N.Britain)	1985	CCOP survey.	
East Pacific Rise (13 degrees N)	1985	Single ship and two ship seismic.	LDGO, Scripps, URI, WHOI.
504 B	1985	MCS survey.	LDGO.
Lau Basin	1985	Dredging, Sea Beam.	
Fracture Zone off Nicaragua	1985	Seismic investigations.	
E. Pacific	1985	Diving in Galapagos Rift, Panama Basin, Gulf of California.	

APPENDIX E-6

CANADA: Research Vessels

Pacific Geoscience Centre 1985 Cruises

CRUISE #	DATES	CHIEF SCIENTIST	SHIP	AREA	ACTIVITY
85-4	06/13 - 07/02	Massey, Chase/Scott	Endeavour	Tuzo Wilson K.	Geology, dredging, camera.
85-5	06/20 - 07/16	Currie/Seemann	Parizeau	W. of Van Isle.	Resource Charting
85-8	08/26 - 09/22	Bornhold/Davis	Parizeau	?	Sediments, coring heat flow.
85-9	09/23 - 10/13	Clowes	Parizeau	Juan de Fuca Ridge.	Seismic.
85-10	09/23 - 10/13	Franklin	Endeavour	Juan de Fuca Ridge.	Geology, dredgings, camera, T.V.
86-01	01/06 - 01/26	Luternauer	Tully	Queen Charlotte Sound.	Sidescan.
86-02	01/27 - 02/08	Bornhold	Tully	Hecate St.	Sidescan.

Atlantic Geoscience Centre 1985 Cruises

?	?	Maier Ryall	Hudson	Kane F.Z.	Sea Marc Rock Drill

Other AGU cruises not relevant to ODP Site Surveys.

APPENDIX F

(116)

JOIDES/ODP SITE SURVEY DATA BANK

Lamont-Doherty Geological Observatory
Palisades, N.Y. 10964
Telephone: 914-359-2900

International Phase of Ocean Drilling

November 14, 1984

Dr. Anthony Mayer
JOIDES Office
Graduate School of Oceanography
University of Rhode Island
Narragansett Bay Campus
Narragansett, R.I. 02882-1197

Dear Tony,

In response to your request, the following is our view on the present difficulties in the site survey program.

There is little question that the site survey process for ocean drilling could be greatly improved. The historical ineffectiveness of the JOIDES Site Survey Panel has been a topic of discussion for several years, and as a result there has been talk of "fine tuning" the panel's mandate or the system in general in order to make the process more efficient.

The difference between the panel's mandate and what it is actually able to accomplish is enormous. Specifically, the problems are as follows:

1) Despite claims to the contrary, there is in actuality very little co-ordination of site survey among IPOD countries. Each country undertakes geophysical studies in areas its scientists are interested in, for drilling related problems or otherwise; frequently, "site surveys" are designated as such only in retrospect. The only country that has historically attempted to "fill gaps" in survey data with any regularity is the U.S. In practice, the "international co-ordination of site surveys" that is supposed to take place at SS-SP meetings consists of each panel member describing the planned movements of his country's research vessels over the next year or two; the majority of these movements often have little or nothing to do with scheduled ocean drilling.

2) There has never been adequate lead time for the panel to examine the existing data set for a drilling proposal. This is due to two factors - the paucity of panel meetings and the difficulty the JOIDES Data Bank has in acquiring the data sets from proponents - and pretty much renders the panel politically impotent. Whatever valuable

input the panel might be able to contribute to the site survey process is made irrelevent by strategic or time constraints.

3) Even under the best of circumstances, and despite its important-sounding mandate, the Site Survey Panel has no real power. Already in the new drilling program important site survey decisions have been made without the panel's involvement. Also, what is the use of having either a panel or a Data Bank review site survey data if the data processing is completed only one month before the drilling leg is scheduled? What if, at its November meeting, the panel judges the Bahamas survey data to be inadequate? Would the drilling schedule be changed? For that matter, when was the last time any PCOM decision was revised or altered because of a recommendation of the Site Survey Panel? If no one enforces the panel's recommendations and if no one requires that the drilling proponents submit their data to the Data Bank, then the SS-SP becomes a vestigial irrelevency in the drilling and site survey process.

Ultimately, to have a panel that meets once or twice a year attempt to deal with a process that is ongoing and constantly changing seems ill-advised. The situation requires day-to-day attention and flexibility that the Site Survey Panel cannot begin to supply. Thus it would seen that whatever services the panel is able to offer under a revised mandate or power structure, they will probably not be sufficient to provide the kind of continual monitoring the situation demands.

There are several conclusions that can be drawn from the above paragraphs: First of all, PCOM must enforce data submission requirements for drilling proposals that survive review by regional or thematic panels. It is impossible for anyone to evaluate site survey data that they have not seen. It is also extremely wasteful to have Data Bank personnel expend significant portions of their time chasing down data from proponents. One of the most useful functions of the Data Bank is its pursuit of data that site proponents are not able to obtain or are not aware of (most co-chief scientist data packages, in fact, include such data) and time spent going after data that should have been routinely submitted in the first place is time lost from investigating other data sources. We recommend (request?) that PCOM pass a resolution stating that proponent(s) for any proposal that survives the initial filtering process of a thematic or regional panel be required to submit for review as complete a data package as possible to the JOIDES Data Bank. This seems more useful than requiring proponents to submit data sets with their initial proposals to the JOIDES Office (a requirement that was never written into the Guidelines for Proposals anyway, despite the resolution passed in the Seattle PCOM meeting).

Since the day-to-day attention to site survey matters cannot be supplied by the SS-SP, decisions have to be made as to where such supervision should come from. One of the attractive things about having a panel look after such matters is its international nature and the feeling

of community it implies, but in actuality there are many decisions that have to be made so quickly that all of the panel members cannot be contacted. The recent flurry of activity over the Southern Chile drilling leg illustrates this - the Data Bank assembled a data package for the Chairman of the SS-SP only, for a "unilateral" decision on survey needs.

Given that such unilateral (and somewhat hasty) decisions are, in fact, part of the site survey process, the wisest procedure would be to have one person with easy access to the data making them. It seems rather silly to have the Data Bank racing to put a package together for some urgent situation if the data must then go overseas for evaluation. If a formalized process was drawn up that was politically enforcible, PCOM could solve the two main problems discussed here - data submission and survey co-ordination - with one gesture by designating a scientist who would work out of the Data Bank and provide advice and communication to proponents, panels, and PCOM, on site survey matters. This person would have the mandate that the Data Bank presently does not have - of evaluating existing data and reporting his evaluations to PCOM on a regular basis. Moreover, and perhaps most importantly, by having the person located at the Data Bank, PCOM would also be ensuring that the data would be promptly and properly submitted for review. Finally, the scientist would have the flexibility to confer regularly with the JOIDES Office, members of the Safety Panel, and the science operator, in order to evaluate existing site survey data, to develop site survey strategies for each drilling leg, and promote the necessary co-operation of all of the appropriate parties.

Sincerely,

John M. Ladd

John Ladd

Carl Brenner

Carl Brenner

JL/CB/ms

APPENDIX G

ODP SITE SURVEY STANDARDS (SSP 01/85)

ENVIRONMENTS 1 - Vital (1) - Desirable (1)* - Desirable, but may be required in some cases, e.g. bottom simulating reflectors.	A. PELAGIC (shallow penetration)	B. SMALL BASIN/OPEN OCEAN subject to debris flow	C. PASSIVE MARGIN single bit	D. PASSIVE MARGIN reentry	E. FORE-ARC WEDGE	F. MID-OCEAN RIDGE	G. OCEAN CRUST	H. HIGH TEMP ENVIRONMENT (special case of others)
TECHNIQUES								
1) Air Gun SCS	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)
2) Water Gun SCS (or other high resolution system)	X	X	X	(X)	X		Xor5	Xor5
3) 3.5 Khz	X	X	X	(X)	(X)		(X)	
4) Chirp Sonar	(X)					(X)		
5) MCS		(X)	X	X	X		Xor2	Xor2
6) Seismic velocity determination			X	X	X	X	X	
7) Side Scan Sonar	(X)	X	(X)or (8)	(X)or (8)	(X)or (8)	X		
8) Sea Beam bathymetry	(X)		(X)or (7)	(X)or (7)	(X)or (7)	X		
9) Piston Cores	X	X	(X)	(X)	(X)	(X)	(X)	X
10) Heat Flow			(X)*	(X)*	(X)*	(X)*	(X)	X
11) Magnetics/Gravity			(X)	(X)		X	X	X
12) Dredging and/or Rock Drill						X		
13) Photography (e.g. ANGUS)						X		(X)*
14) Submersible						(X)		(X)*
15) Current Meter (for bottom shear)			(X)*	(X)*	(X)			

APPENDIX H

SSP Mandate

1. SSP receives mature proposals from the regional and thematic panels, reviews the S.S. data packages and makes the recommendations to PCOM.

2. The SSP promotes international cooperation and coordination of site surveys.

3. The SSP must ensure that there is proper coordination with member nations' site survey activities.

4. The SSP maintains communication with and provide advice to JOIDES panels on S.S. specifications.

5. SSP identifies data gaps in future drilling areas and recommends appropriate action to ensure that sufficient survey information is available for pinpointing specific drilling targets.

6. The SSP must encourage the fullest use of new technologies for surveying potential drill sites.

7. The SSP ensures that all data used for planning and execution of drilling targets are lodged in a proper format in the ODP Databank.

Proposal for geophysical measurements at drill positions for completing site survey - a stimulation for a discussion in the Site Survey Panel.

Additional geophysical measurements for completing site survey results while the bore ship is on site position, will give more detailed informations about the stratigraphical situation under the sea bottom at the site and its environment.

1. Measurements on board the bore ship (reflection seismics)

One or more hydrophones may be lowered down on a cable near to the sea bottom to be used as a deep towed system. More than one geophone with vertical separation (vertical array) could increase the signal to noise ratio by stacking (time delay between the different hydrophones). The instrumentation could base on analog (frequency modulation, one conductor cable) or digital (probably pcm) technique. The signals should be recorded on a paper recorder for direct observation and on magnetic tape for data processing.
The seismic pulses should be generated by air gun (or air gun array) from aboard the ship on site position (main frequency 100 cps or more).
The penetration and resolution of the sedimentary structure depends on the transducer system (frequency range, acoustical energy), the hydrophone array, and the environmental noise, mainly generated by the ship.
This instrumentation will allow a penetration of about 100-200 ms (or perhaps more with an optimised system). First studies by the University Hamburg (refraction group W. Weigel) with a deep towed system with a combination of two vertically arranged hydrophones are shown in Fig. 1. Compared with a 3,5 KHz echo sounder, this system gives more than twice the penetration.
The question is whether such instrumentation also gives good results during drilling. Before testing the above method, a noise study will be necessary (ship's noise without drilling and during drilling, environmental noise).

2. Seismic measurements near the site

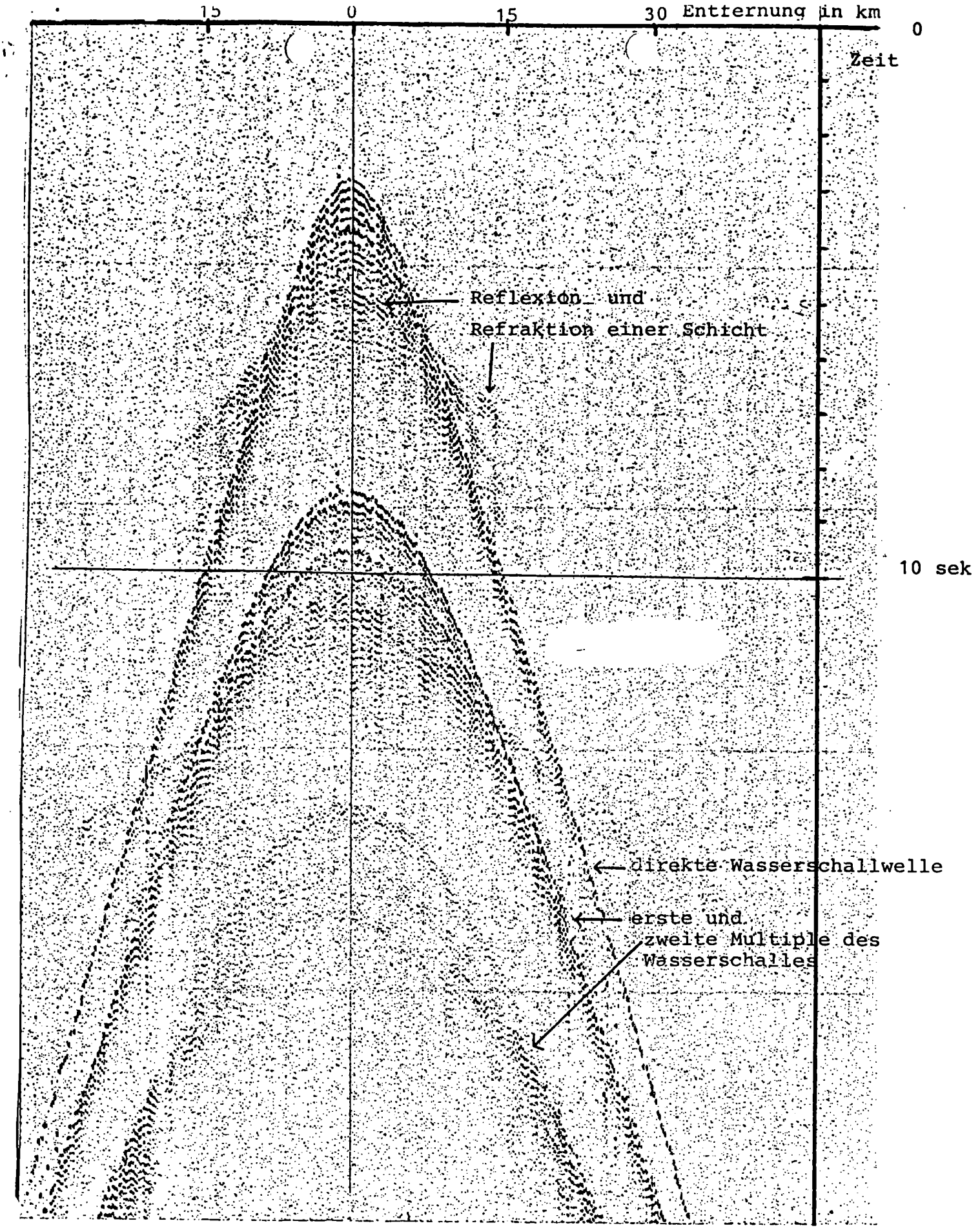
Informations about the sedimentary structure near the sea bottom and the crustal structure around the drill site may be useful. For such experiments a pilot boat will be necessary, equipped with a small compressor, a power supply, radio communication and radar for positioning relative to the drill ship.
From the pilot boat ocean bottom seismographs (OBS) may be placed on the sea bottom and also recovered. Records are possible in a frequency range of 2-100 cps. Seismic reflections may be recorded near the OBS and refraction travel time curves from near bottom layers and also the deeper structure (Fig. 2). The penetration mainly depends on the seismic source (air gun, water gun or explosives). Explosives, electrically detonated, may be used from a pilot boat with charges from 5-10 kg. In areas with low sedimentary thickness (oceanic crust) seismic ranges up to 100 km and penetrations to the upper mantle will be possible. This method allows more information about the sedimentary thickness, the crustal structure, the velocity structure and perhaps anisotropic behaviour around a drill site. The influence of the ship's noise is reduced by measuring with ship independent systems (OBS) and decreases with distance from the ship.

3. Magnetic measurements

Magnetic observations by an ocean botton magnetometer, recording on the sea bottom during drill time near the drill ship could give additional information about variations of the magnetic field and deep crustal structure.
Geophysical measurements on board the drill ship and in its environment during site positions will be - for special purposes - (for example completing site survey information) much less expensive than separate ship cruises.

(Dr.W.Weigel)
Member of Site Survey Panel

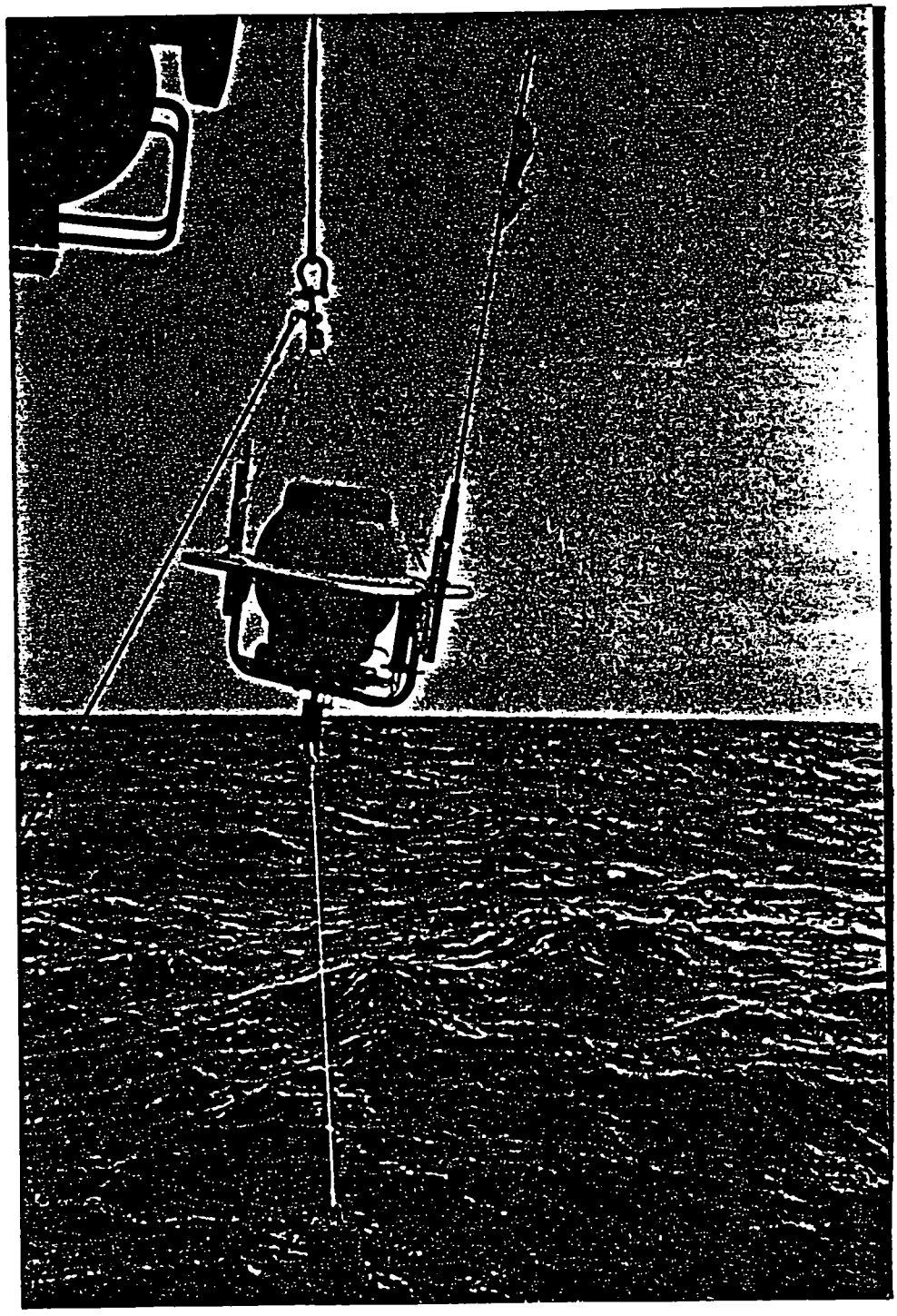
24.11.1984



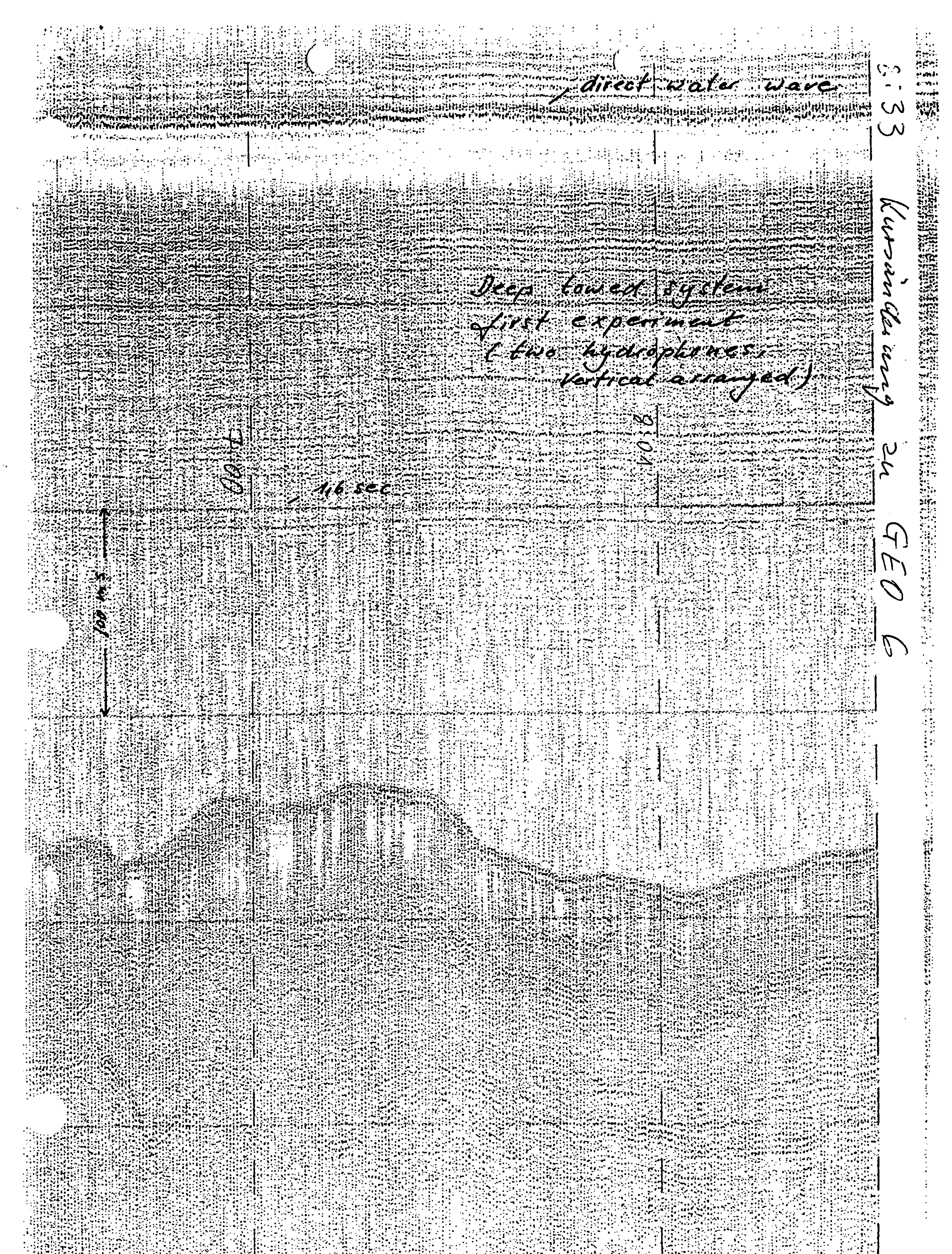
Travel time curves from OBS-measurements.

Seismic source: air gun array.

Uni Hamburg



OBS for deep sea refraction seismics
(University Hamburg, refraction
group Weigel)


direct water wave
Deep towed system
first experiment
(two hydrophones,
vertical arranged)
1,6 sec
5:33 Kursänderung zu GEO 6

APPENDIX J

OPTIONS FOR MAR SEA MARC SURVEY
(Revised from Kasten's memo of 11/26/84)

1. JANUARY CRUISE ON HUDSON USING SEA MARC IA

Sea MARC Ia is a new system with side-scan sonars and a 4.5 kHz down-looking sonar similar to lost Sea MARC I. Sea MARC Ia is owned by John Jollie Associates of Seattle who lease the system on a commercial basis for the Navy and oil companies.

Cost: $120,000 over present budget
- $4,500/day lease fee (includes insurance, but no personnel or shipping. For 2 day cruise plus 4 days shipping and installation: $108,000
- Shipping of Sea MARC Ia San Diego to Halifax and Halifax to Seattle about $12,000 (air freight)

Pro: - High probability of successful collection of good quality side scan records
Logistically and technically relatively simple
Early availability of data for planning drilling leg

Con: - Most expensive option
No CHIRP sonar (4.5 kHz sonar only)
Not compatible with L-DGO top-side electronics

Questions: - Depth rating of tow vehicle?
Full digital recording?

2. JANUARY CRUISE ON HUDSON USING HYBRID SIDE-SCAN SYSTEM

The scheme here is to combine existing components from two of International Submarine Technology's side scan systems: Sea MARC I and Sea Bed II. The topside electronics would come from the Sea MARC I system. The transducers would come from the Canadian-owned cost. A simple telemetry system has been built, incorporating spare boards from Sea MARC I. The new bottom-side electronics and Sea Bed II transducers would be mounted on the old Sea MARC I vehicle, which is presently in storage at L-DGO.

Cost: Not known exactly, but probably at least $30,000-$40,000 (mainly for insurance)

Pro: - Early availability of data for planning drilling

Con: - Logistically and technically difficult given short time available before cruise
High risk of poor quality side scan data or none whatsoever with hurriedly constructed system
No CHIRP sonar

3. JUNE CRUISE ON HUDSON USING NEW SEA MARC

The lost Sea MARC I vehicle was insured and a replacement must be built for Ballard before September. Minimum time required 20 weeks. BIO may be agreeable to adding extra time to Pat Ryle's leg at the KFZ.

Cost: $40,000-$50,000 over present budget
- About $8,000 for reinstallation of towing winch
- Shipping Sea MARC to the Azores on HUDSON, sea freight $4,000 plus custom fees (perhaps $1,000) Return shipping from St. Johns ($2,000?)
- More expensive travel: $5,000
- Insurance: $30,000

Pro: - Adequate time to construct a replacement vehicle
CHIRP sonar could be available
Combined Sea MARC/rock drilling attractive to ODP engineers

Con: - New, untested system; chance of poor data
Delay in availability of data for planning drilling
Possible time conflict for several PIs (Kastens, Detrick, Fox and Karson)

Questions: - When can scheduling be confirmed?
Will HUDSON definitely have GPS?

4. JUNE CRUISE ON THE KNORR USING NEW SEA MARC

The KNORR is currently scheduled to do seismic work at the KFZ in June on a Woods Hole to Azores leg (M. Purdy, chief scientist). Ship will have traction winch and 30,000' coax cable. WHOI may be agreeable to adding 8 days extra to this leg for side scan and camera work.

Cost: $90-$100,000 over present budget
- 8 days @ $13,000/day: $104,000 (minimum), offset partially by $90,000 budgeted for HUDSON shiptime
- $15,000: winch/wire user fee ($500/day)
- $12,000: extra personnel cost for 30 day leg instead of 20 day leg
- $30,000: GPS rental, partially offset by $10,000 for GPS rental in budget
- $30,000: insurance
- $5,000: extra travel
- $5,000: extra shipping and customs

Pro: - Adequate time to construct a replacement vehicle
CHIRP sonar could be available
KNORR is probably a better towing ship than HUDSON

Con: - New untested system; chance of poor data
Delay in availability of data for planning drilling
Potential time conflict as in option (3)

Questions: - Is suitable deck space available on KNORR for Purdy and Ballard's gear and Sea MARC?

5. JANUARY CRUISE ON HUDSON STILL AND VIDEO PHOTOGRAPHY ONLY

Cost: - Less than budgeted

Pro: - Cheap and easy
Good data for siting bare rock drilling hole

Con - Data of almost no value for understanding the geologic or tectonic setting of down hole experiments
Data useless for identifying sediment pockets in transform fault for non-bare rock sites.

APPENDIX K

Tentative Agenda for SSP Meeting, May, 1985.

1. Minutes of La Jolla meeting.
2. Report from PCOM (HB or RL)
3. Science Operator's Report (TAMU)
4. Site Surveys off W. S. America (AM)
5. EPR (JO)
6. Atl. Sub AA SS (WW)
7. Weddell Sea SS (JJ)
8. Kerguelen (SS)
9. Indian Ocean Panel Report + SS (CB)
10. W. Pacific Panel Report + SS (?) (AM or Japan)
11. NE Pacific Workshop Report (JP)
12. C/E Pacific (JO)
13. Kane F.Z. (JO)
14. Review of BB/LS (JP)
15. Tyrrhenian Sea (RS)
16. IPOD Data Bank (CB/PCOM)
17. Riser Drilling Requirements (HB or RL)
18. On Site Experiments (JJ)
19. Ship Movements (JJ)
20. Yucatan (JP)
21. NW Africa (WW)
22. Panel Membership