EXECUTIVE SUMMARY - DRAFT

14th MEETING OF THE SHIPBOARD MEASUREMENTS PANEL

UNIVERSITY OF BREMEN, SEPTEMBER 27-29, 1995

The Shipboard Measurements Panel (SMP) met in Bremen with the aims of reviewing the present status of the shipboard measurements program on the JOIDES Resolution.

Detailed information on the status of the Shipboard Measurements Program was provided by ODP/TAMU representatives Jay Miller and Brad Julson. As usual, much of the meeting was based on the detailed report provided by ODP/TAMU.

Below a summary is presented of those items that led to some specific recommendations by the panel:

Development of Cookbooks

Various cookbooks are in development for the shipboard laboratories and equipment. The laboratory discussion groups, originally encouraged by SMP, have made good progress in the writing of these cookbooks.

SMP is of the opinion that the physical properties laboratory and the MST track are the most in need for a set of cookbooks. In addition concern was expressed that the cookbook should address the use of standards and that reference to their measurement is made during data generation. SMP members are willing to collaborate with ODP/TAMU in the production of the cookbooks.

Recommendation 95-7

SMP strongly recommends that, as cookbooks are developed for the various laboratories on board JOIDES Resolution, these cookbooks are double-checked by appropriate members of the SMP so as to provide quality assurance for these cookbooks (or manuals).

SMP realizes that on occasion the need may arise for active participation by shipboard scientists in those laboratory operations, that hitherto have been the domain of the shipboard technical staff. The latter applies mainly to the use of shipboard XRD and XRF equipment. Prior to the use of the latter equipment, permission must be obtained from the laboratory officer, the staff scientist, as well as the co-chief scientists. This procedure is of importance to assure proper use of the equipment as well as adherence to established procedures.

Recommendation 95-10

SMP appreciates the efforts being made by ODP/TAMU with regards the development of cookbooks and procedure manuals for shipboard equipment. For such equipment that is traditionally handled by ODP/TAMU personnel, it is of importance that any use by members of the scientific party be allowed only after consultation with the Co-chiefs, the Staff Scientist, and the Laboratory Officer. Special attention must be given to the assurance that procedures laid out in the manuals are adhered to, so that the data collected will be consistent with the data in the ODP database.

Data Preservation

Roger Larson informed the SMP that by only one vote the PCOM almost eliminated the publication of the Scientific Results Volume of the ODP. He indicated that this subject may be revived again in the future. This matter caused some concern by SMP, not necessarily with regards the fact of elimination of this volume, but more with respect to the preservation of data collected as a result of post-cruise science. If future reductions should occur in shipboard data collection (a subject not supported by SMP - vide report of the March 95 SMP meeting), it will be increasingly impotant that all data collected under post-cruise contracts and grants (by whatever agency) are introduced in the ODP data base. Arguments that all post-cruise data should find their way into the open published literature, are not necessarily valid, especially as

many journals resist extensive reporting of data tables. In addition some reports are not necessarily publishable in the open literature, but contain extremely valuable information.

SMP wishes to record its opinion on this matter as follows:

Recommendation 95-8

In view of potential future cuts of the ODP Scientific Results Volume, SMP urges PCOM, IHP, and ODP/TAMU to consider the preservation of all data collected during post-cruise scientific research in the ODP data base or any other appropriate recognized data base.

X-Ray Laboratory

ODP/TAMU has purchased an upgraded version of the Philips XRD software, which should prove more user friendly. In addition a new laser plotter has been obtained in support of the new XRD software.

Notwithstanding the above purchases of improved software, SMP has concerns about the ageing of this equipment (see, for instance, the Minutes of SMP Meeting 13, College Station, March 1995):

"The XRD equipment is more than 10 years old and much more efficient designs are presently available on the market. There is no doubt that there will arise, in the near future, a situation that forces the consideration of a replacement. New, up to date equipment, with a more accurate laser-guided goniometer and an X-Ray dispersive capability, is presently available. Such equipment will not only allow better high quality data, but will also yield semi-quantitative information on chemical composition.

SMP wishes to go on record that serious consideration be given to the future purchase of a new XRD system. ODP/TAMU will investigate in detail the most appropriate replacement and more detailed information will be provided at the next SMP meeting. Up-to-date equipment will serve a wide community of users, particularly sedimentologists, mineralogists, and petrographers. Though presently SMP does not suggest immediate purchase, it is necessary for PCOM and JOI to be aware of the potential emergency need for replacement of this equipment."

Jay Miller reported that presently a representative group of XRD users is being queried by ODP/TAMU with regards the present and potential future XRD equipment. Such a query may lead to a more detailed justification for the purchase of new X-Ray Diffractometer (preliminary estimate ~ $225,000). For these reasons the following recommendation was drafted:

Recommendation 95-9

SMP urges ODP/TAMU to proceed vigorously with its enquiry into the present status and/or future potential replacement of the available shipboard X-Ray Diffraction Equipment. Results of this enquiry should be available well in advance of the 1996 Spring Meeting of the SMP.

Satoru Nakashima discussed the principles of a potential shipboard scanning X-Ray Analytical Microscope. He indicated that such equipment will become available from HORIBA Instruments. In principle complete scanning of a core can be achieved, but such a process would take a considerable amount of time. On the other hand one dimensional scanning with occasional scanning intensification could be extremely useful, not only for hard rocks but also for sediments.

Recommendation 95-11

In view of the high potential of shipboard XRF scanning of cores, the SMP recommends that ODP/TAMU investigate this equipment in greater detail, in particular through a visit arranged through panel member Satoru Nakashima to HORIBA Instruments in Japan. By use of a well characterized core and other materials the performance and time requirements of such a scanning device could be established better.

Electrical Resistivity Measurements

SMP discussed the problem of electrical resistivity measurements in some detail. With the purchase of the Volkhardt Spiess electrical resistivity tester and the further progress in Britain on an inductive scanner for whole cores, SMP will review this entire topic during the 1996 SMP spring meeting in College Station.

Thin-section Laboratory

SMP discussed the preparation of thin-sections on the JOIDES Resolution. It was agreed that the ideal circumstances call for polishing both sides of the thin-section. It is realized that time and circumstances may not always allow for this. Standard practice presently is that polishing is only carried out when time is available. Of course, polishing assures better preservation of the thin-sections and, therefore, must be advocated. In order to assure better preservation of thin-sections for future work the following recommendation is made:

Recommendation 95-12

As a minimum, the thin-section slide should be polished on the side mounted, so that it will be suitable for repolishing of the top surface to meet requirements for probework and reflected light studies. If the top surface is not polished, then the cover slip should be attached with binder that will allow easy removal.

Core Description Workshop

Upon request of SMP (SMP Resolution 95-6) the Chairman of the PCOM has constituted a working group on "Sediment Description and Structural Description". This working group has met in College Station in August 1995, with Kevin Brown as chairman. A preliminary report was available to the chairman of SMP, but as this was a draft form, it was not deemed appropriate to distribute this document to the panel.

As the report is not yet in its final form it was decided that the panel membership should receive the report at the earliest possible time for immediate commentary. The chair of SMP will coordinate the responses and inform PCOM on its results, preferably at the annual meeting of PCOM in December 1995. Responses are also necessary so that they can be communicated to the chairs of JANUS working-groups 4b and 5, who also will meet in December 1995. Representation of the membership of the working group will be an imperative for this purpose.

Paleomagnetic Measurements and Equipment

With the purchase of the new Cryogenic Magnetometer, with its higher resolution and lower noise, paleomagnetists will have a new impetus towards high resolution polarity reversal measurements. Robert Musgrave, the new member for AUS-CAN and an expert in paleomagnetism with Staff Scientist experience at ODP/TAMU, pointed out that the new magnetometer, besides having a higher resolution and lower noise, also has a higher demagnetization potential. The practical limit on the existing system is 20 mT, but this does not usually overcome a drill string overprint. Bob Musgrave suggested that there needs to be some clarification from IHP and from the user community as to why demagnetization should not occur beyond 20 mT.

Disposition of the Old Cryogenic Magnetometer

The discussions of the JOI-USSAC Workshop "Geomagnetic Polarity Transition Records from ODP Cores" (Bradley Clement, Convenor), as summarized by Jean-Pierre Valet during the March 1995 SMP meeting in College Station (see minutes of the 13th Meeting of SMP), have led to the purchase of the new shipboard cryogenic magnetometer. However, at that time it was proposed to continue to utilize the old magnetometer at ODP/TAMU for more detailed studies of older ODP cores stored at the Gulf Coast Repository. The relevant section of the minutes of the 13th Meeting are reproduced below:

"What should be done with the present system?

In conjunction with the acquisition of a new system the paleomagnetic community strongly emphasizes the importance of installing the old system at College Station. This is fully justified by the fact that magnetic measurements could not be performed for many legs, either because the demagnetization level was originally limited at 5mT (a value by far too low to remove overprints) or mostly because the magnetometer was not functioning in optimal conditions (sometimes not at all) for reasons as described above. Consequently, an enormous amount of very promising information has been lost. Should this situation be left like that forever? Long core measurements performed with the same system are the only possibility to remeasure those cores. Because the performance of the magnetometer on shore would be greatly enhanced, it is possible to retrieve good records by measuring (or remeasuring) and demagnetizing properly the archive halves.

It is understood that there may be no support to maintain the old system at ODP. However, it can easily be envisaged that paleomagnetists interested in such measurements take care of the cost inherent to maintenance (i.e. mostly helium refills) of the magnetometer."

A message from Brad Clement re-confirmed the wish of the Paleo-Magnetic Community to have this instrument installed at the Texas A&M University.

SMP notes the desire of the Paleo-Magnetic Community to effect this transfer to ODP/TAMU, but before making a final recommendation SMP prefers to see a direct commitment by this community for the use of the equipment towards measurements on the archive material.

Specific reasons for an installation of the old magnetometer at TAMU are:

1. Access to cores;
2. Deconvolution of transitional effects - to be tested on old machine - to apply to existing data.

If the old unit is transferred to College Station it should preferably be moved to a shielded room. One such room is available at TAMU, but not at ODP and this room is probably to small for the purpose. Ideally the system should be housed in the vicinity of the ODP core locker. Shielding does not need to be a huge investment; a stainless steel shell should be sufficient. Maintenance should be relatively low cost, but how much support will be needed is not known. In addition transport and installation costs have not yet been established.

At this time SMP is of the opinion that the transfer of the old magnetometer to ODP/TAMU will be of advantage to the Paleo-Magnetic Community, but that there is a need to work out details of such transfer, including space, costs of tranfer and installation, as well as costs to run this facility (user contributions ?). Robert Musgrave has agreed to co-ordinate a response form the user community emphasizing the specifics of this unprecedented exercise. SMP expects to revisit this proposal during the Spring Meeting of 1995, so that appropriate action can be advocated prior to the installation of the new Cryogenic Magnetometer.

Spinner Magnetometer

Robert Musgrave indicated that there is an additional need in the Paleomagnetics laboratory for a new spinner magnetometer. Discrete measurements can be made in the new cryomagnetic unit, but this is a serious bottleneck in core flow. There are also specific studies which can be accommodated only by this instrument. These studies include investigations of ephemeral rock magnetism, that cannot be done postcruise.

Mass normalized susceptibility and intensity will probably become an issue in the future, so there will likely be a need to weigh samples (pmag scientists will require access to a weigh station). This will not be done every drilling leg, but high resolution studies will require this. There will be a need to notify ODP/TAMU of the desire to mass normalize prior to the cruise.

Magnetization of Drilling and Coring Tools

Jay Miller indicated that ODP/TAMU has received a request to allow the measurement of magnetization of drilling and coring tools during transit. Permission has been tentatively given for Leg 166-T. SMP is concerned that these measurements will not be very useful, because magnetization in tools is not constant or consistent (tools get magnafluxed; magnetization changes during drilling/coring operations). However, SMP does recognize that this will give an indication of the order of magnitude of the drilling overprint potential, which does not exist now. Therefore, SMP endorses this measurement plan in principle.

JAMSTEC

A discussion of JAMSTEC made it clear that JAMSTEC is already proceeding with acquiring equipment for the future riser drilling vessel, inter alia an MST device.

The SMP is most interested in these developments and hopes to remain informed on matters of common interest. In principle, SMP should meet in Tokyo next autumn to ensure a direct contact with JAMSTEC.

MINUTES - DRAFT ONLY
14th MEETING OF THE SHIPBOARD MEASUREMENT PANEL
UNIVERSITY OF BREMEN, SEPTEMBER 27-29, 1995

Members present
Robin Brereton (UK)
Ronald Chaney (US)
Lucy Edwards (US)
James Hawkins (US)
Siegfried Lallemant (F)
Robert Musgrave (AUS-CAN)
Satoru Nakashima (J)
Massimo Sarti (ESF)
Heinrich Villinger (G), **Host**
Joris Gieskes (US), **Chairman**

Members absent
Terri King (US)
Janet Pariso (US/F)

Liaisons present
Robert Larson (PCOM)
Jay Miller (ODP/TAMU)
Brad Julson (ODP/TAMU)

Liaisons absent
Kevin Brown(TECP) at IHP, Hawaii
Paul Dauphin (NSF) at SGPP, Copenhagen

Guest
Volkhardt Spiess (University of Bremen)

1. Opening of the Meeting

The meeting started at 9 am on Wednesday September 27, 1995 in the meeting room of the Geology Department of the University of Bremen. Arrangements for this meeting were kindly made by the host, Professor Heinrich Villinger.

The chairman welcomed the panel and, especially because of the large new membership, each panel member made a brief statement of their interests and expertise related to the panel.

The chairman noted that all the necessary expertise is still present on the panel and that this serves the panel well.

2. Review of Previous Meeting

The chairman noted that all recommendations from the 13th meeting of the SMP in College Station have been followed up by PCOM and/or ODP/TAMU.

Particularly pleasing is the observation that the request by SMP for the renewal of the paleomagnetic equipment (SMP Recommendation 95-4) has been followed up with the purchase of a new system by ODP/TAMU. Particular thanks are due to the outgoing member of SMP, Dr. Jean-Pierre Valet (F), who, for the last few years, has urged the SMP to support the renovation of this equipment.

A new computer controlled pycnometer (SMP Recommendation 95-3) has been obtained by ODP/TAMU.

Equipment for the upgrading of the temperature recording devices of the WSTP has been obtained by ODP/TAMU (SMP Recommendation 95-5).

Upon recommendation of SMP the PCOM has convened a committee on "Sediment Description and Structural Description" (SMP Recommendation 95-6). This committee has met in August 1995 under the Chairmanship of Dr. Kevin Brown (TECP/SMP). A preliminary report on this workshop was available to the chair of SMP and Ron Chaney reported on the panel's discussions during the SMP meeting (see below) The official report of the working group will be available in the near future and will be distributed to both the SMP membership

and the active component of Usergroups 4a and 5 (Susan O'Connell and Steve Hurst, chairpersons). Comments should be available prior to the meetings of these usergroups in December 1995.

During the March 1995 meeting of SMP a discussion was held about the future of shipboard measurements, partly caused by concerns about possible cuts in shipboard programs. SMP, though not necessarily in favor of such cuts, would like to obtain information requested in the minutes of that meeting. For these reasons the relevant section of these minutes is repeated here:

"Future of Shipboard Measurements

SMP is well aware of the budgetary constraints put on ODP as a result of funding reductions. In order to study the future of Shipboard Measurements in greater detail under these constraints, SMP deems it appropriate to request ODP/TAMU to provide information to be discussed in detail during the next meeting of SMP:

1. It is requested that a list be made of all major equipment, emphasizing the following:
    a. Life expectancy;
    b. Changes required for future use;
    c. Availability of spares;
    d. Software requirements.

2. SMP also would like more information in the form of flow-charts of the various laboratories, indicating contributions to the final product of a cruise, as well as the necessity of performing the measurements on the ship.

SMP wishes to stress that hitherto the Panel, justifiably, has advocated the full scale of measurements on board ship, thus providing an opportunity to a large number of scientists from different disciplines to produce a product of first class scientific value in an unique environment that stimulates collaboration. This has served very well also in the training of young scientists and graduate students. Thus, though economic necessities may force some reductions in these efforts, SMP wishes to use the above requested information in a very carefully considered manner. The philosophy should remain that the shipboard party should produce a first rate scientific result through collaborative science on board the JOIDES Resolution."

The Spring 1996 Meeting of SMP in College Station should provide an excellent opportunity to discuss these matters in greater detail.

3. Report from PCOM

PCOM representative Roger Larson reported on activities of PCOM, especially those related to the panel.

After a brief discussion of the financial status of the Ocean Drilling Program, Roger Larson reported on some aspects pertinent to SMP. He pointed out that, as a result of the recent "Performance Evaluation" of the Ocean Drilling Program, a suggestion was made for a Service Panel "Superstructure" -TECHCOM:

TECHCOM

IHP SMP DMP TEDCOM

with TECHCOM reporting to the PCOM

SMP considered this topic briefly, but finds one major problem with such an arrangement, in that its presently excellent working relationship with ODP/TAMU might be impeded by such a restructuring process. This would not necessarily be to the advantage of the

drilling program as a whole. Presumably this topic will be discussed further at the December PANCH meeting, but SMP urges caution with such a restructuring.

Heinrich Villinger suggested that a more vigorous liaison with the other service panels, especially IHP and DMP, either through joint meetings or through attendance of the liaisons to these panels. If meetings are held at different times, then the liaisons will be able to report back to the panel as a whole.

Roger Larson further described the status of the ODP "Long Range Plan" and the FY 97 Prospectus. One development of importance to SMP is the observation that JAMSTEC is working on plans for a future riser drilling platform ("Godzilla Maru") - see also the report by the Japanese SMP member Satoru Nakashima (see below).

Roger Larson pointed that a report of Mike Storms (ODP/TAMU) on "alternative platforms" can be made available to the SMP membership. SMP would appreciate receiving this report for reasons of more informed future discussions.

4. Report from NSF-ODP

Unfortunately Paul Dauphin was not able to attend the SMP meeting and hence no report is available.

5. Report from ODP/TAMU

Jay Miller reported in extenso the activities of the ODP/TAMU relevant to the SMP. Below the various activities and status reports on the various laboratories are discussed in detail.

One important concern was expressed by Ron Chaney with regard the upgrades of shipboard equipment. Constant vigilance is necessary that data types remain compatible with previous data. This should be a concern of all the ODP/TAMU working groups.

5.1. SMP 95 Recommendations

95-1: Cookbooks

Various cookbooks are in development for the shipboard laboratories and equipment. The laboratory discussions groups, originally encouraged by SMP, have made good progress in the writing of these cookbooks.

Ron Chaney suggested that the physical properties laboratory and the MST track are the most in need for a set of cookbooks. SMP has considered this an important topic for the last few years. Jay Miller explained that particularly in the Physical Properties Laboratory has seen a continuous state of flux with upgrades being made on most or all equipment, thus making the writing of a cookbook for this laboratory difficult. SMP does concur, however, that the Physical Properties and the Multiple Sensor Track (MST) are the most in need of documentation and urges ODP/TAMU to give this full attention in the near future.

In addition concern was expressed that the cookbooks address the use of standards and that reference to their measurement is made during data generation. SMP members are willing to collaborate with ODP/TAMU in the production of the cookbooks.

Recommendation 95-7

SMP strongly recommends that, as cookbooks are developed for the various laboratories on board JOIDES Resolution, these cookbooks are double-checked by appropriate members of the SMP so as to provide quality assurance for these cookbooks (or manuals).

The chairman of SMP can serve as the anchor for this activity and will pass these documents on for review by the relevant SMP member. Another efficient way would be the distribution of cookbooks, explanatory notes, or other documents through a WWW Homepage or other means of electronic communication. SMP requests ODP/TAMU to ensure that easy

access to the documentation is enabled so that reviews of documents can be carried out in a rapid, straightforward manner. Jay Miller indicated that he will communicate potential access problems to the computer group at ODP/TAMU.

95-2: Explanatory Notes

Jay Miller reported that copies of the "generic" Explanatory Notes are essentially ready and that copies of these will be provided to the SMP membership at least one month ahead of the Spring Meeting of SMP). Again, ODP/TAMU is urged to assure that these Explanatory Notes become easily accessible, for instance through the WEB, CD-ROM, or any other appropriate means.

Jay Miller pointed out that the "Explanatory Notes" will appear on a Compact Disk accompanying the volume of the Initial Reports. However, SMP suggests that any changes made during a drilling leg must be recorded not only on this CD, but also in a short printed note in the Initial Reports. In any case, data tables should refer to any changes made in procedures with reference to the CD for further information.

Though data preservation on the CD is of the utmost importance, SMP argues that this preservation of collected information is essentially the task of the Information Handling Panel. SMP's primary task is to ensure the best and most accurate data base possible, through the best possible methodologies.

Roger Larson informed the SMP that by only one vote the PCOM almost eliminated the publication of the Scientific Results Volume of the ODP. He indicated that this subject may be revived again in the future. This matter caused some concern by SMP, not necessarily with regards the fact of elimination of this volume, but more with respect to the preservation of data collected as a result of post-cruise science. If future reductions should occur in shipboard data collection (a subject not supported by SMP - see report of the March 95 SMP meeting), it will be increasingly important that all data collected under post-cruise contracts and grants (by whatever agency) are introduced in the ODP data base. Arguments that all post-cruise data should find their way into the open published literature, are not necessarily valid, especially as many journals resist extensive reporting of data tables. In addition some reports are not necessarily publishable in the open literature, but contain extremely valuable information.

SMP wishes to record its opinion on this matter as follows:

Recommendation 95-8

In view of potential future cuts of the ODP Scientific Results Volume, SMP urges PCOM, IHP, and ODP/TAMU to consider the preservation of all data collected during post-cruise scientific research in the ODP data base or any other appropriate recognized data base.

95-3: Pycnometers

Jay Miller reported that ODP/TAMU has recently purchased two new pycnometers to replace units which were reaching the end of their operational life. One of these pycnometers will remain on shore to facilitate the ongoing development of new controlling programs for pycnometer data acquisition. ODP/TAMU foresees installation by Leg 165.

95-4: Cryogenic Magnetometer

SMP appreciates the work by ODP/TAMU towards obtaining a new, more sensitive cryogenic magnetometer. Jay Miller reported that appropriate software is in development and that ODP/TAMU foresees installation of the equipment prior to Leg 168 in Seattle.

The fate of the present shipboard equipment will be discussed in a separate section below.

95-5: Data Loggers for WSTP

Jay Miller reported that new ADARA data loggers have been purchased and will be installed in the available WSTP units prior to Leg 165.

SMP discussed the problem of testing the data loggers and suggests that ODP/TAMU maintains contact with Dr. R. von Herzen of the Woods Hole Oceanographic Institution regarding this problem.

5.2. Laboratory Overview

Paleomagnetic Laboratory

This laboratory has been discussed above and will receive more attention in a subsequent section.

Petrology-Paleontology Laboratory

The new Zeiss Axioplot paleontology microscope has been installed on Leg 161 with a cookbook written by John Firth. This instrument contains a sophisticated image display and capture system, and has attachments for transmitted light, polarized light, and phase contrast analysis (used by paleontologists and petrologists), Diffraction-Interference-Contrast (DIC) and dark field contrast analysis (used by some nannofossil paleontologists and many palynologists), and reflected light UV, blue light, and green light fluorescence (useful for organic matter determination and maturity analysis, microbiological studies, and carbonate petrology/cementation analysis).

New video equipment with higher-resolution video capture boards (resolution 756X456 pixels with 24 bit color or 1008X456 pixels with 16 bit color) has been obtained. This equipment will allow significantly higher quality images, approximating photographic quality, useful for publication as photographs or in the form of files on a CD-ROM.

Two new light source tables have been purchased to improve image capture (either photographic or electronic) capability for the shipboard stereoscopes.

X-Ray Laboratory

Jay Miller reported the purchase by ODP/TAMU of the Tokyo Kagaku Co., Ltd. XRF-RF coil bead preparation fluxer, which will replace the Claisse Fluxer device.

SMP suggested a comparison of the two methodologies with special attention to the problem of sodium determinations.

ODP/TAMU has purchased an upgraded version of the Philips XRD software, which should prove more user friendly. In addition a new laser plotter has been obtained in support of the new XRD software. It would be appropriate to obtain an evaluation by ODP/TAMU of the software performance at the next SMP meeting.

Notwithstanding the above purchases of improved software, SMP has concerns about the ageing of this equipment (see, for instance, the Minutes of SMP Meeting 13, College Station, March 1995):

"The XRD equipment is more than 10 years old and much more efficient designs are presently available on the market. There is no doubt that there will arise, in the near future, a situation that forces the consideration of a replacement. New, up to date equipment, with a more accurate laser-guided goniometer and an X-Ray dispersive capability, is presently available. Such equipment will not only allow better high quality data, but will also yield semi-quantitative information on chemical composition.

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Recommendation 95-9

SMP urges ODP/TAMU to proceed vigorously with its enquiry into the present status and/or future potential replacement of the available shipboard X-Ray Diffraction Equipment. Results of this enquiry should be available well in advance of the 1996 Spring Meeting of the SMP.

Jay Miller also reported on the development of a new version of the XRD cookbook. It appears appropriate to transmit this documentation to those scientists that respond to the above query for comment. The documentation is a good example of the "Laboratory Cookbooks" developed by ODP/TAMU. Additional copies will be send by the SMP chairman to selected scientists familiar with the shipboard XRD equipment for their review.

After an enquiry by one of the new SMP members as to whom the cookbooks are addressed, the chairman explained that SMP has asked specifically for the development of these cookbooks, mostly to ensure proper use of the equipment as well as to serve as information to Shipboard Scientists participating in a drilling leg. In addition the need may occasionally arise for active participation by shipboard scientists in those laboratory operations, that hitherto have been the domain of the shipboard technical staff. The latter applies mainly to the use of shipboard XRD and XRF equipment. Prior to the use of the latter equipment, permission must be obtained from the laboratory officer, the staff scientist, as well as the co-chief scientists. This procedure is of importance to assure proper use of the equipment as well as adherence to established procedures.

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Satoru Nakashima discussed the principles of a potential shipboard scanning X-Ray Analytical Microscope. He indicated that such equipment will become available from HORIBA Instruments. In principle complete scanning of a core can be achieved, but such a process would take a considerable amount of time. On the other hand one dimensional scanning with occasional scanning intensification could be extremely useful, not only for hard rocks but also for sediments. After further discussion James Hawkins suggested that this matter should be investigated further:

Recommendation 95-11

In view of the high potential of shipboard XRF scanning of cores, the SMP recommends that ODP/TAMU investigate this equipment in greater detail, in particular through a visit arranged through panel member Satoru Nakashima to HORIBA Instruments in Japan. By use of a well characterized core and other materials the performance and time requirements of such a scanning device could be better established.

Chemistry Laboratory

Brad Julson reported that the laboratory procedures and cookbooks have been developed recently. This material will be used by the JANUS-project User Group 3a during its deliberations in Autumn 1995.

Joris Gieskes introduced a report on the status of the Organic Geochemical Program on board of JOIDES Resolution. The report was designed as a first start in the renovation and

improvement of procedures in the Organic Geochemistry laboratory of the JOIDES Resolution. This report will be redistributed among the respondents originally queried re the Organic Geochemistry Laboratory as well as to the acting part of JANUS Project Working Group 3a for further comments. Further input from the community will be available prior to the SMP Meeting of Spring 1996, so that a final recommendation to PCOM and ODP/TAMU can be made at that time. Meantime ODP/TAMU has been requested to provide their own prioritization list of equipment in the entire geochemistry laboratory.

Physical Properties Laboratory

Jay Miller indicated that the MST is being provided with an appropriate cookbook, put together by Bill Mills of ODP/TAMU. SMP looks forward to this, especially because of the increased importance of the MST in paleoceanographically oriented legs as well as in those dedicated to the detailed study of sediment structures, e.g., accretionary margin legs. Considerable work continues to be expended on designing new software and control modules for the MST, with special attention paid to integrating the output files into the JANUS database. The software is LabVIEW-based, utilizing a single PowerPC 8100/80 for control of all instruments. Hardware upgrades include a new encoder and a new indexed microprocessor stepper motor/driver, and will collect spectral Natural Gamma data on a multichannel buffer that links directly to the PowerPC. A more utilitarian track is under development by ODP (planned installation during Leg 165). SMP encourages this development and looks forward to a much enhanced performance of the MST in the future.

Jay Miller indicated that the "Alan Mix" split-core color scanner has been tested during Leg 162. SMP looks forward to a performance evaluation.

SMP has received copies of a detailed report by Peter Blum of ODP/TAMU: "ODP Shipboard Physical Properties Laboratory Overview: Present Status and Recommendations for a Generic Data Table and User Interface Formats." The document is intended as a working document, directed principally to JANUS Project User Groups 2 and 3. The report does contain several items of direct interest to the SMP. Particularly important are:

a. Thermal Conductivity

SMP is aware that there are still problems with the new thermal conductivity system provided by Teka (Berlin). SMP hopes that rapid progress will be made in this matter. This topic will be discussed in greater detail during the Spring 1996 meeting of SMP in College Station.

b. Electrical Resistivity

SMP noted some problems of communication between ODP/TAMU and Dr. Volkhardt Spiess of the University of Bremen re the performance of the electrical resistivity tester recently purchased by ODP/TAMU. Discussions during the SMP meeting both with Dr. Spiess and Messrs. Miller and Julson have served to remove some of the misunderstandings and a more direct contact between the parties has been assured. SMP looks forward to rapid, positive results of this interaction.

SMP does wish to reiterate its interest in a good, reliable system for the measurement of electrical resistivity of sediment cores. In principle, detailed measurements of electrical resistivity (associated with Formation Factors) can serve as important checks on density/porosity measurements and will also yield information on diffusive properties of the pore fluids of sediments.

Robin Brereton reported on further progress of the British system of electrical resistivity scanning of half cores. This apparatus has undergone significant changes since originally tested by ODP.

In view of the importance of this topic SMP plans a more complete review of electrical resistivity measurements during the Spring Meeting of the Panel.

Thin-section Laboratory

SMP discussed the preparation of thin-sections on the JOIDES Resolution. It was agreed that the ideal circumstances call for polishing both sides of the thin-section. It is realized that time and circumstances may not always allow for this. Standard practice presently is that polishing is only carried out when time is available. Of course, polishing assures better preservation of the thin-sections and, therefore, must be advocated. In order to assure better preservation of thin-sections for future work the following recommendation is made:

Recommendation 95-12

As a minimum, the thin-section slide should be polished on the side mounted, so that it will be suitable for repolishing of the top surface to meet requirements for probework and reflected light studies. If the top surface is not polished, then the cover slip should be attached with binder that will allow easy removal.

Underway Geophysics

Jay Miller reported on the substantial improvements made in the Underway Geophysical Laboratory. This is most encouraging and the data quality coming from this laboratory will be of great use not only for the science but also for the navigation on board ship.

6. JAMSTEC

Satoru Nakashima informed the SMP on the status of the future drilling plans of the Japanese Marine Science and Technology Centre (JAMSTEC). A blue paper has been prepared and was made available to the panel: "Ocean Drilling in the Twenty-First Century - OD 21". The main concern of JAMSTEC in a technological way is the development of a Riser Drilling Platform, which will enable the drilling of deep, stable holes in various tectonic settings.

Satoru Nakashima explained the scientific structure of Japanese interests in Ocean Research activities, in which the Science and Technology Agency is chiefly responsible for ships (Research Vessel MUTSU), submersibles (SHINKAI 2000; SHINKAI 6500), and the future Riser Drilling Platform. Co-operation between the Science community and JAMSTEC, of course, are of primary importance.

At present JAMSTEC is proceeding with acquiring equipment for this future research vessel, inter alia an MST device. For these reasons it will be of importance to maintain contact with JAMSTEC, especially because SMP can be of use in the future planning of shipboard laboratories.

SMP notes the interest expressed by the Downhole Measurements Panel in potential collaboration with JAMSTEC, resulting in a proposal to have a joint meeting of DMP and JAMSTEC in Tokyo in Spring 1996.

The SMP is similarly interested in these developments and hopes to be informed on matters of common interest. In principle, SMP should meet in Tokyo next autumn to ensure a direct contact with JAMSTEC.

7. Core Description Workshop

The Chairman of the PCOM has constituted a working group on "Sediment Description and Structural Description" as requested by SMP resolution 95-6:

Recommendation 95-6

SMP strongly recommends to PCOM/JOI that as soon as possible a working group on the problem of preservation of detailed core descriptions and structural information be formed. This group should consist of: 2 Sedimentologists; 2 Structural Geologists; 1 Paleoceanographer; 1 SMP Representative; 1 TAMU Representative.

The working group should meet for 2 days and during the latter part of the workshop should consult with a representative of TRACOR on the problem of compatibility with the data base.

SMP will be glad to aid in the formulation of a mandate and in the composition of this workshop."

The working group has met in College Station in August 1995, with Kevin Brown as chairman. A preliminary report was available to the chairman of SMP, but, as this was a draft form, it was not deemed appropriate to distribute this document to the panel. The mandate of the panel was as follows:

"The mandate of the working group is to cover the whole issue of improving shipboard core descriptions in the Ocean Drilling Program, including scanning techniques, paying particular attention to getting appropriate data into the Janus data base efficiently for the scientists at sea."

Ron Chaney presented a brief description of the results of this workshop, which had as one of the main conclusions that a restructuring of data capture techniques was of importance, not only to ensure more uniform data descriptions, but also to reduce time spent by shipboard sedimentologists and structural geologists on routine core descriptions. Of importance, however, is the summary of the draft report:

"The present shipboard core description process and subsequent barrel sheet production is an exceptionally tedious and inefficient process and, despite the time investment, a significant amount of the resulting information is not entered into the data base in a subsequently usable form. Some data, such as structural measurements, have not been entered at all until recently. The Core Descriptions Working Group (a.k.a. CDWG) looked at ways of changing current procedures to more efficiently record detailed core descriptions that will be archived in the new Janus database and further address some of the mechanisms by which these data could be later accessed in a usable form. The CDWG included representatives of all the major groups involved in the core description process. Because of the existence of the central JANUS project, possibilities now exist for a fully integrated international data base that will once again give the core description scientists a chance to do science rather than just data entry.

It became quickly clear during our discussions that the data entry process for core descriptions must be greatly simplified and computerized, with no duplication of effort in the data entry process or barrel sheet production. The CDWG concluded that a central feature of this process must ultimately be a digital image of the core (collected by digital camera or scanner) that is linked with the core/depth location and the described features. The image would show at a glance the spatial relationships between described features and would allow the scientist to simply point out or outline important details rather than laboriously drawing the outline of core pieces and geological structures. Simple data entry procedures and automatic barrel sheet production based on computerization keyed to digital images could potentially save 50% of the time currently spent by shipboard scientists on data entry. This method will also provide a much more consistent core description record and allow for a degree of quality control that could not be conceived of before. The CDWG felt that the input of core description data, whether for sedimentary, igneous, or metamorphic rocks, is conceptually the same at the level of a feature or interval. Therefore, any program developed for data entry should be able to accommodate the data resulting from the description of any kind of core as long as it is possible to develop a template that will accommodate the specific objectives of each leg (e.g., a hard rock vs. an ocean history leg). Data entry should be consistent, but easily customizable to the extent necessary to fulfill the goals of the different drilling legs. This report documents a system that will meet these requirements and make the core description process more efficient. It is clear from our discussions that both user groups 4b and 5 must meet and develop the package together, because all types of core require input and retrieval of the same types of basic information.

The likely prospect for wasteful repetition of effort and confusion are disturbing given the short time frame in which the system must be made operable. It also seems clear that user group chairs from both groups 4b and 5 need to be advanced onto the Janus project steering

committee very soon in order to bolster the committees experience with direct "hands on" contact with core material and data input problems."

The draft recommendations of this panel are:

RECOMMENDATIONS

1) Contain excessive sideways expansion in User Groups 1 - 4a so the basic framework is completed for Groups 4b and 5 within the Tracor contract period. We must have the basic Janus framework in place to build upon.

2) It may be necessary to find funds to extend the six month development window designated for Groups 4b and 5 in order to test available cad/cam programs for the core description entry process and to verify their ability to deal efficiently with imported digital images.

3) Because of the commonality of many of the basic types of observation Groups 4b and 5 must initially meet together to plan a common core descriptions data template. The groups can then put together their own individualized templates once they have put in place a common baseline.

4) Funds must be found to assess the prospect for and implementation of the collection and importation of images collected via a scanner or digital camera. It must also be realized that, until the transfer of digital images becomes a automated process, a technician will have to be trained to cut out the relevant portions of the raw and paste the required portions of the image into the core descriptions program. While this should not be full time job, both shifts would require this service. It would be best if time were allocated to develop an automated program that will take the image from the camera and import it directly into the core descriptions program in the appropriate format.

5) We discourage the idea that scientists should be expected to draw unaided on the computer screen via a mouse or digitizing pad. It is difficult to attain the necessary skill and coordination and the net result will be highly inaccurate data input unless the scientists can trace over an image.

6) Detailed development of a core description cookbook should ultimately be the charge of the sub user groups with a wide circulation through the larger subgroups for further input. We expect that, like all the other previous Cookbooks, these will take a year or so to come to a near complete form.

7) The shipboard scientists must have at least "read only" access to the data collected during the leg contained in the Janus data base in the subsequent 12 month period.

SMP in consideration of the urgency of this problem, especially with regard the discussions of JANUS Working Group 4b (Sediment Description/Structural Geology), which group will have its first meeting in College Station in early December 1995, decided to distribute the final form of the Brown Committee report at the earliest convenience for commentary by relevant sections of the panel as well as by the participating members of the Working Group 4b meeting. Clearly direct interaction between these groups is important (see recommendations above).

Preliminary cost estimates are $125,000 (including cameras and computers).

8. Paleomagnetic Measurements and Equipment

New Cryogenic Magnetometer

With the purchase of the new Cryogenic Magnetometer, with its higher resolution and lower noise, paleomagnetists will have a new impetus towards high resolution polarity reversal measurements. Robert Musgrave, the new member for AUS-CAN and an expert in paleomagnetism with Staff Scientist experience at ODP/TAMU, pointed out that the new

magnetometer, besides having a higher resolution and lower noise, also has a higher demagnetization potential. The practical limit on the existing system is 20 mT, but this does not usually overcome a drill string overprint. Bob Musgrave suggested that there needs to be some clarification from IHP and from the user community as to why demagnetization should not occur beyond 20 mT.

Disposition of the Old Cryogenic Magnetometer

The chairman received a letter from Will Sager for PCOM with regards the disposition of the old shipboard cryogenic magnetometer. The relevant document as well as a response by Jean-Pierre Valet received by the Chairman of SMP are reproduced in Attachment 1 of these minutes. In addition the chairman received an advance copy of the report on the JOI-USSAC Workshop "Geomagnetic Polarity Transition Records from ODP Cores" (Bradley Clement, Convenor), which had just appeared in the press. The discussions of this workshop, as summarized by Jean-Pierre Valet during the March 1995 SMP meeting in College Station (see minutes of the 13th Meeting of SMP), have led to the purchase of the new shipboard cryogenic magnetometer. However, at that time it was proposed to continue to utilize the old magnetometer at ODP/TAMU for more detailed studies of older ODP cores stored at the Gulf Coast Repository. The relevant section of the minutes of the 13th Meeting are reproduced below:

"What should be done with the present system?

In conjunction with the acquisition of a new system the paleomagnetic community strongly emphasizes the importance of installing the old system at College Station. This is fully justified by the fact that magnetic measurements could not be performed for many legs, either because the demagnetization level was originally limited at 5mT (a value by far too low to remove overprints) or mostly because the magnetometer was not functioning in optimal conditions (sometimes not at all) for reasons as described above. Consequently, an enormous amount of very promising information has been lost. Should this situation be left like that forever? Long core measurements performed with the same system are the only possibility to remeasure those cores. Because the performance of the magnetometer on shore would be greatly enhanced, it is possible to retrieve good records by measuring (or remeasuring) and demagnetizing properly the archive halves.

It is understood that there may be no support to maintain the old system at ODP. However, it can easily be envisaged that paleomagnetists interested in such measurements take care of the cost inherent to maintenance (i.e., mostly helium refills) of the magnetometer."

A message from Brad Clement re-confirmed the wish of the Paleo-Magnetic Community to have this instrument installed at the Texas A&M University.

SMP took note of the desire of the Paleo-Magnetic Community to effect this transfer to ODP/TAMU, but before making a final recommendation SMP prefers to see a direct commitment by this community for the use of the equipment towards measurements on the archive material.

Specific reasons for an installation of the old magnetometer at TAMU are:

1. Access to cores;
2. Deconvolution of transitional effects - to be tested on old machine - to apply to existing data.

If the old unit is transferred to College Station it should preferably be moved to a shielded room. One such room is available at TAMU, but not at ODP and this room is probably to small for the purpose. Ideally the system should be housed in the vicinity of the ODP core locker. Shielding does not need to be a huge investment; a stainless steel shell should be sufficient. Maintenance should be relatively low cost, but how much support will be needed is not known. In addition transport and installation costs have not yet been established.

At this time SMP is of the opinion that the transfer of the old magnetometer to ODP/TAMU will be of advantage to the Paleo-Magnetic Community, but that there is a need to

work out details of such transfer, including space, costs of transfer and installation, as well as costs to run this facility (user contributions ?). Robert Musgrave has agreed to co-ordinate a response form the user community emphasizing the specifics of this unprecedented exercise. SMP expects to revisit this proposal during the Spring Meeting of 1995, so that appropriate action can be advocated prior to the installation of the new Cryogenic Magnetometer.

Spinner Magnetometer

Robert Musgrave indicated that there is an additional need in the Paleomagnetics laboratory for a new spinner magnetometer. Discrete measurements can be made in the new cryomagnetic unit, but this is a serious bottleneck in core flow. There are also specific studies which can be accommodated only by this instrument. These studies include investigations of ephemeral rock magnetism, that cannot be done postcruise. Mass normalized susceptibility and intensity will probably become an issue in the future, so there will likely be a need to weigh samples (pmag scientists will require access to a weigh station). This will not be done every drilling leg, but high resolution studies will require this. There will be a need to notify ODP/TAMU of the desire to mass normalize prior to the cruise.

Magnetization of Drilling and Coring Tools

Jay Miller indicated that ODP/TAMU has received a request to allow the measurement of magnetization of drilling and coring tools during transit. Permission has been tentatively given for Leg 166-T. SMP is concerned that these measurements will not be very useful, because magnetization in tools is not constant or consistent (tools get magnafluxed; magnetization changes during drilling/coring operations). However, SMP does recognize that this will give an indication of the order of magnitude of the drilling overprint potential, which does not exist now. Therefore, SMP endorses this measurement plan in principle.

9. Janus Status Report

Unfortunately Terri King was not able to attend the meeting as a result of an hectic schedule involving the return from Leg 162 and the responsibilities associated with the Data Base Steering Committee (mid September 1995). Below follows a paraphrasal of her message to the chair of SMP:

"Things (Data Base Project) are proceeding well, and we anticipate that the project will be on schedule as the first shipboard testing is to commence on Leg 165. Of the usergroups that SMP and IHP defined last year, Group 1 applications are nearly complete. User Groups 2a (MST/LOGS/paleomag), chaired by Nick Pisias, and 3 (Physical Properties) chaired by Kate Moran, have had very successful meetings and prototyping is underway. Shipboard testing of 2a and 3 applications should commence on Leg 165. User Group 2b, chaired by Phil Weaver, is having a meeting at ICP in Halifax. Group 4a (Chemistry), chaired by Kay Emeis, is very active and will meet in College Station in a few weeks. Group 4b (Sediments/Structures), chaired by Susanne O'Connell, should be meeting in December. The Steering Committee was very impressed by the look and feel of the new database."

Brad Julson presented a brief overview of the progress and state of the Group 1 applications (Corelog, Sampling, Curations, and Operations). In addition, the chairman received a copy of the minutes of the Steering Committee Meeting (September 14 and 15), but in the absence of Terri King it was decided to defer any discussion to the Meeting in College Station in Spring 1996, where input from ODP/TAMU and Terri King will be assured.

10. Water-Sampling-Temperature-Probe

Recommendation SMP 95-4, concerning the upgrade of the temperature recording device in the current WSTP to a device based on the ADARA temperature tool, has been executed by ODP/TAMU. The WSTP tools will be upgraded as from Leg 165 (see discussions above).

The new temperature probe (Earl Davis, Canada) with an associated new temperature recording devise (Heinrich Villiger, Gemany) has been discussed by the Downhole

Measurements Panel (DMP) and has been cleared, in principle, for testing during Leg 164, the Hydrate Leg.

The new in-situ water sampler, featuring a syringe type sampling mechanism, rather than the old WSTP type "flash" sampling mode should be ready for testing during Hydrate Leg 164. The tool also features a more streamlined probe geometry, so that there is less tendency to crack the formation. In addition is has a modular design for faster turnaround. SMP supports this development and planned testing. Whereas the WSTP has obtained very good water samples for comparison of the inorganic geochemistry with the routine shipboard analysis of interstitial waters, sampling for dissolved gases in a quantitative fashion has been much less successful. If the tool can be shown to be more successful for this purpose, the addition of a temperature probe could lead to the further upgrading of the WSTP device.

The Chairman of the SMP has had interactions with Charlie Paull (Co-chief Scientist of Leg 164) urging the testing of the device during that leg, especially because a more quantitative sampling of dissolved gases would be in the advantage of attempts to solve the hydrate problem.

Testing of these new tools is of great importance for future legs, both those involving sedimentary Ridges (Leg 169) and accretionary prisms (Leg 170).

11. Bremen Core Repository

Heinrich Villinger organized a visit to the Bremen Core Repository on Thursday afternoon. The SMP membership was favorably impressed with the outlay of the repository. One improvement could be in the acquisition of one or two MacIntosh based computers, so that visiting scientists can have access to software brought along for the visit.

12. Panel Membership

SMP appreciates the large change in its membership, assuring the provenance of new ideas and opinions. The JOIDES Office conveyed to the chair of SMP a list of its membership and the suggested rotation schedule. Although Ron Chaney would officially rotate off in 1995, we submit that Ron's expertise is still much in need for SMP and, therefore, SMP suggests continued tenure of this position for one more year. Ron Chaney has expressed an interest in this.

13. Time and Place of the Next Meeting

SMP wishes to emphasize that it prefers not to meet at the same time as IHP or DMP, so that liaisons to these panels (Lucy Edwards to IHP; Heinrich Villinger/Ron Chaney to DMP) can also attend the SMP meeting and report on the problems of common interest. A meeting in early March 1996 is envisaged,