

**MINUTES OF THE 15th MEETING OF *DRAFT*
THE SHIPBOARD MEASUREMENTS PANEL**

COLLEGE STATION, TEXAS MARCH 5-7, 1996

Members present:

Robin Brereton (UK)
Ronald Chaney (US)
Lucy Edwards (US)
James Hawkins (US)
Terri King (US)
Robert Musgrave (CANAUS)
Satoru Nakashima (Japan)
Janet Pariso (US)
Massimo Sarti (ESF)
Heinrich Villinger (Germany)
Joris Gieskes (US), Chairman

Liaisons Present:

Roger Larson (PCOM)
Kevin Brown (TECP)
Jay Miller (ODP/TAMU), Host

ODP/TAMU:

Brad Julson
James Allan
Peter Blum
Russell Merrill
Matt Stahl

Members Absent:

Siegfried Lallement (at sea)

TRACOR:

Jerry Burke
Glenn Corser
John Bode

Liaisons Absent:

Paul Dauphin (NSF)

Guests:

Sara Harris
Peter Jackson

1. Opening of the Meeting.

The meeting started at 9 am on Tuesday March 5, 1996 at ODP/TAMU.

The chairman welcomed the Panel, the various participants from ODP/TAMU, as well as the distinguished guests Sara Harris and Peter Jackson.

There were no alterations in the minutes of the last meeting in Bremen (September 27-29, 1995).

2. Remarks from the ODP/TAMU Director Jeff Fox.

Jeff Fox informed the SMP on some of the key decisions made during the most recent EXCOM Meeting. In particular he mentioned EXCOM Consensus 96-1-9 and especially: "The technical and financial challenges that the Long Range Plan places before us are considerable and our past experience suggests that we will need to establish clear

scientific, technical, and administrative priorities in order to ensure that we meet these challenges. We are setting in motion planning and evaluation mechanisms that will allow us to set these priorities". In addition Jeff Fox indicated that JOI, in consultation with PCOM and BCOM, has been asked to examine the important new innovations in the program (Borehole Utilization, Legacy Holes, etc.) and to detail their costs. In this framework the question was raised as to "what existing components might be dropped or reduced to accommodate the new initiatives...". This, of course, led to the recognition of the question that has been posed by the SMP previously:

"Future of Shipboard Measurements.

SMP is well aware of the budgetary constraints put on ODP as a result of (potential) 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. This information constitutes an important legacy of the Ocean Drilling Program."

The staff at ODP/TAMU will carry out this study during the summer of 1996, but it must be recognized that this is by no means a simple task and that time must be allotted to the various Laboratory Working Groups to address this problem. Jeff Fox indicated that an effort will be made towards this goal. The documentation of this task will be discussed during the Fall Meeting of SMP.

SMP looks forward to obtaining the requested information so that SMP and ODP/TAMU can jointly investigate in detail what impact potential reductions in shipboard measurements will have on shipboard science or on budgetary savings.

3. Report from PCOM.

Roger Larson informed SMP on actions of the PCOM during its meetings in December 1995 in La Jolla.

All SMP recommendations resulting from the Bremen meeting have been approved with the exception of Recommendation 95-12 on "Thin Sections", which was approved under the proviso that this program should be carried out on a time-available basis only.

Roger Larson reiterated the observations of Jeff Fox, that the overall budget for FY 96 is down at \$ 44.4 M, from the previous budget of \$ 44.9 M. This re-emphasizes the need to seek cost reductions throughout the program, wherever possible.

Roger Larson also informed the panel that JAMSTEC is continuing plans for the design and construction of the Riser Drilling Vessel "Godzilla Maru". Recently a meeting was attended by representatives of the US-NSF, which has shown great interest in this project.

Finally Roger Larson also indicated that SEDCO is willing to keep the day rate for the Joides Resolution at close to the present level (~ \$ 45,000/day) under the condition that refurbishing of the vessel is agreed upon during the upcoming dry-dock period in 1998.

4. Report from NSF.

Due to the absence of the NSF representative, no official report was available.

5. Physical Properties Laboratory.

Peter Blum informed the SMP in detail on the status of the physical properties laboratory.

5.1. New Data Models (for JANUS Data Base)

All physical property data models have been upgraded and converted in a relational data model for the JANUS Data Base:

A. Full-core logging MST

- * Gamma-ray attenuation density (GRA)
- * Magnetic susceptibility
- * P-wave velocity (PWL)
- * Natural gamma-radiation (NGR)

B. * Thermal conductivity (Woods Hole system) (TC1)

C. Split core measurements:

- * P-wave velocity, penetration z (PSW1)

- * P-wave velocity, penetration y (PSW2)
- * P-wave velocity, penetration xyz (PWS3)
- * Automated vane shear (AVS)
- * Pocket penetrometer (PEN)
- * Manual torvane (TOR)

The following measurements are still in need of attention:

- * Thermal conductivity, Teka (TC2). This equipment will soon yield data in a routine manner.
- * Moisture and density (MAD)
- * Resistivity
 At this stage SMP has argued for a temporal discontinuation of a routine program, but SMP requests that space be made available in the data base to input resistivity data in the future, especially if data are obtained by third party tools brought onto the ship by interested scientists.

Recommendation 96-1

SMP endorses the new data models, including further minor modifications that may arise during the final JANUS implementation.

In addition SMP endorses the concept of a generic data entry utility to save special data into the JANUS data base.

5.2. Laboratory Documentation.

Peter Blum indicated that, as a result of the construction of data models, insufficient time has been available to construct "cook-books" requested by SMP. This will now be accomplished through the construction of the "Generic Explanatory Notes".

After the Leg 166T transit, during which the PP Laboratory procedures will be firmed up, Peter Blum will put all effort into generating the generic section of the Explanatory Notes on physical properties.

Peter Blum recommended to SMP the following items:

- (1). SMP can expect the Physical Property Explanatory Notes by Fall 1996.
- (2). An SMP member with physical properties expertise should participate in a drilling leg later this year to test step-by-step on-line guides to PP measurements, which will accompany the Explanatory Notes.

5.3. Core Resistivity Report.

Peter Blum presented a report on the performance of the electrical conductivity apparatus obtained by ODP/TAMU from Dr. Volkhardt Spiess of Bremen University. Though data obtained by Spiess's group on cores in the LDEO Repository were shown to be of good quality (data presented by SMP member Heinrich Villinger), the apparatus obtained by ODP/TAMU showed large problems with reproducibility of the measurements. Peter Blum presented an exhaustive report on this problem and a continued discussion by

SMP led to the recommendation to cease deployment of this apparatus on "JOIDES Resolution". In a later section this problem will be addressed further.

5.4. Teka Thermal Conductivity System (TK04).

Peter Blum presented a status report on the Teka Thermal Conductivity System. This system will replace the old shipboard device built by WHOI, which has been in service for many years.

The Teka system has been tested thoroughly and is ready for deployment starting Leg 167 or 168. Especially with the high interest in heatflow during Legs 168 and 169 this instrument will play a vital role during these legs.

One of the main drawbacks of the Teka system, when compared with the old WHOI system, is the fact that only one probe is used at any time. This will cause, especially on high recovery legs, a low depth resolution (1 to 2 measurements per core). It is, therefore, recommended that further development is necessary towards a multiprobe system. Such a development may require a Request for Proposals (RFP).

Recommendation 96-2

SMP agrees with the deployment of the Teka TK04 Thermal Conductivity Apparatus as from Leg 167. This deployment will (for the time being) be in addition to the existing WHOI equipment. SMP also recommends that thought be given towards development of an RFP for the expansion of the TK04 apparatus to a multiprobe system. Finally SMP endorses the proposal to integrate the Teka program in the Physical Properties Laboratory and also in the JANUS Data Base.

5.5. Natural Gamma Ray Spectral Data.

Peter Blum presented results of an investigation of the use of natural gamma-ray spectra obtained with the shipboard scintillation detector. These tests were carried out during Leg 156 of ODP. The more complete documentation will be published in the Leg 156 Scientific Results Volume.

The results of this exercise indicated that, in principle, useful information on the concentrations of K ($\pm 14\%$), U ($\pm 24\%$), and Th ($\pm 16\%$) can be obtained. It was also shown that acquiring 2048 channel data had no real advantage over the use of only 256 or less channels.

Recommendation 96-3

SMP recommends that the natural gamma-ray system be configured for 256 channel data acquisition for routine spectral data collection and archiving.

SMP also concurs with the suggestion that the JANUS Data Base provide three report options: total counts only (for most short-count data

sets); 5-window spectra compatible with Schlumberger Downhole Logging; and 256-channel spectra (for rare long count data sets).

In addition SMP supports the suggestion that ODP/TAMU shall purchase standards in 50 cm coreliner segments, having known amounts of K, U, and Th.

5.6. Gamma-Ray Attenuation Calibration.

Peter Blum pointed out that presently the density calibration is carried out with two aluminum rods of different diameters to yield 2.7 and 1.0 g/cm³, respectively. Because the thinner rod is used to simulate the bulk density of water, but has the attenuation property of aluminium, initial estimates of the bulk density must be fluid corrected. This so-called "Boyce Correction" uses assumptions for "apparent density" and grain density, caused mainly by the significantly different attenuation of water. He suggested that instead of the smaller Al-rod a water core be used for calibration. SMP agrees that this is, in principle, an excellent approach and deserves to be tested.

Recommendation 96-4

SMP recommends that the present gamma-ray attenuation density calibration using two aluminum rods of different diameters be replaced by a method that uses a water core and an aluminum rod. This new calibration procedure should first undergo comparative testing. SMP also recommends that ODP/TAMU obtain funds for the purchase of an appropriate balance to determine the mass of whole cores, thus providing an overall check on "whole core density" evaluations.

5.7. Moisture and Density Methods.

Peter Blum discussed the three presently available methods of volume determination to be used to calculate density and related properties:

- A. Bulk volume sampled with a fixed (known) volume ring or syringe type of device;
- B. Bulk volume measured in a gas pycnometer;
- C. Dry volume measured in a gas pycnometer.

A three year moisture density database reveals that no use has been made of method A. The method A procedure is very cumbersome and can only be applied to few suitable lithologies and depth intervals. Furthermore, if used in combination with methods B and C, the overall procedure used by the shipboard party for particular intervals is difficult to anticipate and implementation of an efficient computer control is compromised.

SMP agrees with this conclusion and submits the following recommendation:

Recommendation 96-5

SMP recommends that the bulk volume sampling method for density measurement be eliminated from the shipboard measurement program. In addition SMP recommends that the salt corrections should use a standard correction of 0.035 (salinity = 35) with the corresponding density of standard sea water.

6. Update on JANUS Data Base Project.

Terri King (Chair JANUS Steering Committee) and Joris Gieskes (Monday March 4) attended the JANUS Steering Committee meetings just prior to the SMP meeting. Messrs. Jerry Burke, Glen Corser, and John Bode agreed to stay one more day in order to inform the SMP on the status of the JANUS Data Base Project.

Terri King indicated that a full TRACOR complement of experts will sail on the transit leg 166T (April 14-21) and that two members of the JANUS Steering Committee will sail on this transit (Terri King and Kate Moran). In addition one member of the geochemistry working group 3a will sail (Gretchen Hempt) and an active search is being carried out for a physical property person to sail also.

Russell Merrill made a brief introduction on the status of the JANUS Data Base Project, introducing Gil Munoz of ODP/TAMU and the Tracor representatives.

Gil Munoz indicated that ODP/TAMU is forging ahead with making the data base available through the World Wide Web (<http://janusxp.tamu.edu>, oraweb/janusweb). At the end of the SMP meeting Gil Munoz gave a brief ad hoc demonstration of this project.

Jerry Burke presented an overview of the progress of the TRACOR Data Base Project and indicated that the work under the auspices of Usergroups 1 and 2 is essentially finished. Work with the MST is making rapid progress and MST data can now be plotted on the standard VCD form - this can be a useful tool during the core description process. Various aspects of the finished work will undergo extensive shipboard testing during Leg 166T, in particular:

- * Physical Properties.
- * Chemistry Laboratory development and testing.

Potentially the new system should be on-line by Leg 168. In any case, by Leg 169 this task should be completed.

Glen Corser and John Bode subsequently demonstrated some of the aspects of the TRACOR system. SMP is grateful for this, especially because these gentlemen came to College Station after 2 months at sea during Leg 165.

Terri King continued the discussion and suggested the following recommendation - with the agreement of SMP:

Recommendation 96-6

Any new equipment brought onboard of the "Joides Resolution" must have an JANUS/ORACLE interface capability.

A brief discussion was held on the migration of legacy data and it was agreed that any such project should be carried through an appropriate RFP.

7. Publications

Ann Klaus made a presentation on the status of the ODP Publications. She indicated that, in consultation with IHP, large changes have and will be made both in the Initial Reports and the Scientific Results volumes. Any possibility of a discontinuation of the latter, of course, reiterates the concern of SMP expressed during the Bremen Meeting in September 1995.

Quote:

"Data Preservation

The topic of data preservation was discussed by SMP, particularly because of a potential stoppage of the Scientific Reports. 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 EXCOM 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.

unquote

Jay Miller commented that the preservation of post-cruise data is not within the current development contract with TRACOR. Many data types accumulated during post-cruise research are different from those acquired during a cruise and it would require a

significant cost and manpower effort to implement archiving in the data base. ODP/TAMU, however, has always considered preservation of post cruise data an integral part of its service to the scientific community. From a historic perspective ODP/TAMU (as well as DSDP) has had a problem with the availability of these data from the science party. That is, data presented in the SR volumes are typically subsets of the entire post-cruise effort and, despite the IHP mandated submission requirement, complete data tables are often not submitted to the ODP Data Librarian.

8. Report from ODP/TAMU

Jay Miller reported on the progress made by ODP/TAMU on the various recommendations made by the SMP during the Bremen meeting.

8.1. Recommendation 95-7: Quality Assurance for Cookbooks.

ODP/TAMU will see that SMP is provided with versions of cookbooks as they are prepared. As a first start various members of SMP will be provided with a section of the "Generic Explanatory Notes" that is within the expertise of the particular SMP member. Jay Miller will forward these sections to SMP members with the request for inputs at their earliest convenience. This will then allow the production of the Explanatory Notes.

8.2. Recommendation 95-8: XRD replacement.

ODP/TAMU has sent out an enquiry with respect the need for a replacement of the presently available XRD equipment. Answers from about 34 users have been received and at the same time quotes have been received from Rigaku, Philips, and Scintag. This will be discussed further in the section on the status of the X-Ray Laboratory.

8.3. Recommendation 95-10: Use of shipboard equipment by science party.

ODP/TAMU has endorsed this recommendation - mainly geared toward such delicate equipment as the X-Ray Fluorescence Apparatus. The best procedure to make scientists aware of this requirement is through inclusion of the preamble and the SMP Recommendation (which has been endorsed by PCOM) in the Leg prospectus.

8.4. Recommendation 95-11: XRF Core Scanning.

See below under X-Ray Laboratory - section 9.1.

8.5. Recommendation 95-12: Thin Section Preparation.

Jay Miller indicated that the Petrology Laboratory Working Group has effectively implemented this policy, in that polished thin sections are prepared when requested and as time allows on a leg. Jay Miller also expressed the concern of the working group that the recommendation regarding removable cover slips may be problematic. If sections are cut to proper thickness and covered, polishing after removal of the coverslips may result in sections that are too thin.

SMP considered this problem again and concluded that using unpolished sections leads to less usefulness to users on the drilling leg during which the sections are produced,

but their subsequent deterioration is of even greater concern. For instance, use of previously made thin sections (Leg 152) during Leg 163 was rendered almost impossible. This seems counterproductive and, for these reasons SMP reiterates its previous recommendation.

Recommendation 96-7

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. All thin sections of hard rock material (or other appropriate material, e.g., massive sulfides) shall be polished, unless there are friability constraints to prevent this.

9. Status of ODP Laboratories.

The status of several of the laboratories on board Joides Resolution was discussed in greater detail.

9.1. X-Ray Laboratory

Jay Miller informed the SMP that the Philips XRD software has been installed. Testing of this software on fast data reduction and output is underway. The X-Ray Laboratory Working Group is in contact with Philips on this program evaluation and hopes that the new software will act in an increasingly satisfactory manner.

Work on detailed "how to" manuals for preparing and running X-Ray Fluorescence samples as well as for the XRD equipment is almost finished. This write-up will be provided to appropriate members of SMP as well as knowledgeable members of the user community for review.

Jay Miller reported on the response of the community with regards the present and future status of the X-Ray Diffraction apparatus. The following items are of importance:

Costs:

Scintag, Siemens, Philips virtually the same, Rigaku significantly less expensive.
Base cost USD \$150K, with spares about USD \$200K.

Hardware:

Philips is the most robust; Scintag units more than 3 years old had significantly more hardware failures than similar age Siemens equipment. No data on Rigaku except that good data in the low angle range was a problem unless there were two diffractometers.

Software:

Older Scintag users were not impressed, 5 out of 6 new purchasers, however, much prefer Scintag software to Philips. Most Siemens users are happy with software.

Ease of Use:

Scintag rated high, particularly with recent purchasers. Only one comment on new

Philips software suggests it is a significant improvement over the old version.

On-line technical support:

Siemens, Philips, Scintag all rated acceptable.

Documentation:

There is none for Scintag, Philips and Siemens rated acceptable.

Telephone technical support:

All rated high, but Scintag has only one technical expert.

Trade in allowance:

Only from Philips.

The general feeling of the ODP/TAMU X-ray Laboratory Working Group (LWG) is that we know Philips is robust and will operate in the shipboard environment. ODP/TAMU are also familiar with Philips service personnel and they know our specific environment. Before purchase, however, the LWG suggests that x-ray marine laboratory specialists see the new Philips system in operation to assess how well it will meet the demands of our shipboard operations.

SMP reiterates the observation that new XRD equipment will be necessary in the near future, as the present equipment is rapidly aging.

Satoru Nakashima reported that the Horiba X-ray Scanner discussed during the Bremen meeting of SMP may not be appropriate for shipboard use as a result of the extremely small diameter of the scanning area (~ 100 μm). However, there is potentially useful apparatus available from TN Spectrace (California). Joris Gieskes will attempt to visit Spectrace during Spring 1996 and report to the Fall SMP Meeting.

9.2. Status of the Chemistry Laboratory

The Chemistry Laboratory Working Group has initiated investigations in response to the Memorandum on the Status of the Organic Chemistry Laboratory (see minutes of the Bremen, 1995 meeting).

9.2.1. Rock-Eval/Geofina (GHM) Evaluation.

During the upcoming Leg 167 and possibly Leg 169, sediment organic carbon contents will be high enough to allow a comparative evaluation of these units. Leg 167 will sail two Organic Geochemists, but sediment recovery may be very high. ODP/TAMU will, however, request the Leg 167 organic chemists to make this study on a time available basis. SMP concurs with this request and will also contact these organic geochemists with regards this evaluation.

9.2.2. CHNS Apparatus.

The Chemistry LWG has carried out a feasibility study with the following results:

To plumb the apparatus for C/N-only requires a different configuration of the columns. Instead of one column, oxidation and reduction are separated into two columns connected by a U-joint (US \$ 235). The Chemistry LWG has procured the necessary equipment and will be testing the new configuration during the transit Leg 166T.

The benefits of this set-up are:

1. Increased column life: C/N only columns may last 700-1000 samples, whereas CHNS columns only allow the processing of 100-120 samples.
2. With C/N-only plumbing analyses will be four times faster. For those legs in which only C/N is of interest, this would greatly facilitate data collection.

One of the drawbacks is:

Because the runs are quicker, more of the chemistry laboratory's technicians' time will go to weighing the samples as a result of increased demands. Shipboard parties are urged to make no unreasonable demands on the chemistry laboratory for the sake of collecting more data. The Laboratory Officer should have the ultimate authority on this matter.

SMP considered this item and submits that C and N data are primary data, whereas S data are considered as optional data.

The Chemistry LWG also pointed out that changing the set-up midcruise is not a viable option, mostly as a result of time constraints.

Recommendation 96-8

SMP considers the collection of C/N data of primary importance and C & N data are to be considered as prime data. The CHNS Apparatus should be plumbed for C/N only, unless an Organic Geochemist(s) indicates well in advance of the Leg that the S data are requested. In that case the apparatus will be plumbed for that purpose.

9.2.3. Coulometer.

A Labview program is being constructed to operate and electronically capture data produced by the coulometer. This program should go on-line during Leg 168.

9.2.4. Gas Chromatograph/Mass Spectrometer (GCMS).

ODP/Tamu has investigated the lease options for Leg 169:

1. Hewlett Packard requires a one year lease contract (\$2000/month).
2. Line Quantum Analytics will provide shorter term leases (3 months @ \$ 5,600/month or \$ 18,000).

Budgetary constraints prevent ODP/TAMU to effect these lease options.

9.3. Downhole Tools Laboratory

9.3.1 Davis Villinger Temperature Probe (DVTP).

Heinrich Villinger presented a description of the DVTP as well as data on its performance during several tests on Leg 164. The tip design (with two thermistors) makes it possible to use the tool to great depths (~ 440 mbsf during Leg 164), where other tools such as the HPC-ADARA or the WSTP will not function anymore. Internal controls, such as a temperature probe at the electronics board and a vertical accelerometer to monitor the movement of the tool, allow quality control. The excellent performance during this first deployment suggest the rapid progress of this tool into a "mature tool". DMP has also considered this tool during its Spring 1996 meeting.

9.3.2. WSTP.

Jay Miller reported that the temperature loggers for the WSTP (same as the ADARA loggers) will undergo bench tests and will be installed during the Leg 167 port call.

Legs 168 and 169 will provide a excellent opportunities to make a further comparison between the ADARA, DVTP, and WSTP tools, especially now that the new temperature loggers will be available. The use of the WSTP remains of importance to the shipboard geochemists, because in situ water samples still serve as a check on the pore water chemistry done on samples obtained from shipboard extraction techniques.

9.3.3. Fisseler Water Sampler.

Matt Stahl of ODP/TAMU presented a description of the Fisseler Water Sampler. During Leg 164 this sampler was functional, but, as with the WSTP, the formation was relatively unyielding and no water samples were obtained (similarly these clay rich sediments were not easy to squeeze during the routine shipboard collection of pore fluids). Some redesigns of the filter head as well as reduction in sample size can be made. In any case, even without such modifications, the apparatus deserves further testing, e.g., during Leg 169 and/or 170.

9.3.4. Pressure Core System.

Matt Stahl of ODP/TAMU presented the improvements made by ODP/TAMU in the design of the PCS: a new cutting shoe design; new core catchers; Xylan coated coreliners (prevent jamming). During Leg 164 a total of 46 runs were made with this tool, 43 for cores, 3 for water. The average recovery was 30% and pressures exceeded 75% of hydrostatic in 70% of the runs and 90% hydrostatic in 56% of the runs.

It is interesting that this success was first achieved in the same area of the world ocean where Maurice Ewing originally suggested the need for the construction of a PCS during the very early stages of the DSDP.

9.4. Underway Geophysics.

Jay Miller indicated that new seismic 6-channel streamers are being rebalanced and

will probably be deployed on Leg 168.

There are presently three GPS systems in the U-W laboratory (MX1707) and two 8-channel dGPS-capable Omnistar and one more GPS on the bridge (MX4400). This availability should suffice for providing GPS in an emergency.

There is strong evidence for the need to replace the present chart recorders for the U-W laboratory (3.5. and 12 KHz systems). Replacement parts are no longer available and insufficient parts are in stock for maintenance.

10. X-Ray CT Scanner

Jay Miller indicated that the TAMU Petroleum Engineering Department is in the possession of an HD 200 X-Ray Scanner. Some of the SMP members visited this facility. Though the availability of an X-Ray scanner has been discussed previously and, mostly for reasons of costs and space availability, has been disregarded, this sophisticated apparatus would be available to interested scientists using ODP materials. Understandably, the apparatus would be available on a recharge basis.

11. Discussion of Color Measurements

Upon request of the JANUS user group 2 chairman Nick Piasias, who specifically asked for guidance towards the preferred measurement system onboard the Joides Resolution, the SMP studied this problem in detail.

Sara Harris of Oregon State University presented a detailed description of both the apparatus and the results obtained with the OSU Split Core Analysis Track. The apparatus was used intensively during ODP Legs 154 and 162. All comparisons between OSU and Minolta data were based on measurements from Leg 154. The Minolta data were collected shipboard and the OSU data were collected post-cruise in Bremen. Sara Harris indicated that this is the only leg for which such comparative data exist.

The OSU equipment has the advantage of using a much wider range of wave lengths (250-950 nm) than the Minolta (visible range 400 - 700 nm). Data extending the wavelength range out to 2500 nm (obtained with a laboratory instrument that requires dried, powdered samples) showed that a useful option for the future would be an extension of the wavelength range of the OSU equipment to 2500 nm.

The comparison between Minolta and OSU results indicated similarities in the percentage reflectance vs. depth diagram, but the OSU equipment shows greater detail. In addition the noise level in the Minolta data is higher than in the OSU data. The correlation plot of % CaCO₃ measured vs. % CaCO₃ (estimated from color data) is similar for all three types of measurement and with the aid of gamma-ray information from the MST track accuracies of 3 % in the estimated CaCO₃ content can be achieved. Using Leg 154 data, Sara and co-workers were able to reproduce the major downcore shifts in kaolinite/illite based on reflectance proxies that do not include the NIR data from 950-2500 nm (i.e., not the laboratory reflectance instrument). These estimates are based on empirical relationships. Even though these estimates work to some degree, the lure of the NIR is that clay minerals exhibit strong absorptions in the 2200-2500 nm (NIR) range that are much more diagnostic than anything in the visible range.

Satoru Nakashima presented information on his experiences with the Color Reflectance Minolta CM2002 (400-700 nm; 30 channels in 10nm steps).

The measurement of color occurs in terms of the L* a* b* color system (CIE 1976 International Scale), where L* gives the reflectance (varies with water and surface conditions) and a* and b* are good indicators of chromaticness.

The apparatus is very effective for the rapid scanning of:

- * Weathering/alteration fronts in granites
- * Color changes in cherts (paleo anoxic to oxic transition)
- * Color changes in marine sediments
 - * L* ---> CaCO₃, Organic C, MnO_x
 - * a* ---> Mn²⁺, Fe³⁺ (Fe₂O₃)
 - * b* ---> Fe³⁺ hydroxides

The apparatus is ideal for the measurement of redox fronts.

After a demonstration of the usefulness of color data for geochemical purposes Satoru Nakashima indicated several methods for improvements in the methodologies:

- A. Use of the probe track in an MST track arrangement - this is also being addressed by ODP with respect to the Minolta Apparatus.
- B. Wider wave-length apparatus (Field Geosensor) with higher resolution - (400 - 2500 nm). Cost estimate: ~ \$100 K.
- C. Future UV-VIS-NIR sensor with use of SiO₂ fiber optics - could be mounted on a MST track (split core). Cost estimate: ~ \$10K.

Both these presentations leave little doubt that the measurement of color is becoming an increasingly useful measurement within the frame of the Shipboard Measurements Program. ODP/TAMU indicated that the idea of a mounted camera in a split core MST arrangement is presently in development, which should lead to more reproducible measurements and less frustration to the shipboard users.

At this stage SMP is of the opinion that the Minolta will remain the essential equipment for the measurement of color and color reflectance on board ship. During Leg 167 the OSU system will sail again and thus another opportunity will arise for a comparison of the data obtained with that equipment and the improved use of the Minolta Camera.

Recommendation 96-9

SMP strongly suggests that data obtained by color measurements be reported as L*, a*, and b* values in an independent table. These data should be considered to be Prime Data.

Use of the Munsell Color Index, though familiar to many sedimentologists should

be discouraged. However, especially when color equipment is not available, this may still form an important alternative to color measurements, though the Minolta will provide a much more densely spaced data base.

12. Discussion of Electrical Resistivity Measurements

Peter Jackson of the British Geological Survey provided detailed information on the methodologies developed in his laboratory for the measurement of the electrical conductivity of sediment cores. His principal methodology (a version of the apparatus previously used during Leg 133 of ODP) is different from that used in the Spiess methodology (c.f., section 5.3.). Here the core undergoes the generation of a uniform electrical current at both ends of the half core and then voltage drops are measured by means of electrodes that only touch the surface of the sediments. The measurements can be made every 5 millimeters and the electrical field can be measured in the x and y directions.

The information gained can be used to obtain information on the detailed distribution of porosity and water saturation of rocks and/or sediments through the application of Archie's relationships.

Examples presented by Peter Jackson gave an excellent impression of a detail that cannot be achieved by visual observations of the core materials. The use of this equipment could, in principle, serve as an excellent complement to the data obtained with the MST track. In addition the electrical imaging allows the determination of low porosity zones that might go undetected by standard MST measurements.

Peter Jackson also indicated that his laboratory has worked on non-contacting resistivity measurements, which again could provide useful information and could, in principle, be incorporated in an MST device. He indicated that Geotek is interested in such a system. With the participation of Peter Schultheiss of Geotek in Leg 169 an opportunity may arise to test these new methodologies.

SMP is grateful to Peter Jackson for his detailed presentation and discussion of the potential of electrical imaging techniques. SMP suggests that at present this will remain in the category of "third party" tools, though on certain drilling legs, especially those concerned with sediment structures, the use of this equipment will be extremely useful.

SMP further discussed the problems encountered by ODP/TAMU with the Spiess-Resistivity Apparatus. Heinrich Villinger showed that under ideal circumstances this apparatus will yield very good agreement between measured and derived porosities, but agreed that in order to make the resistivity program routine, there will be a need for more reliable apparatus.

Recommendation 96-10

SMP agrees that the ODP/TAMU purchased electrical resistivity apparatus should not be deployed on board ship at this time.

Further discussion suggested that continued investigation of this apparatus on a time available basis would be advantageous. At the same time ways should be found to have an outside interested party carry out further checking of this apparatus. At the same

time SMP suggests that the possibility to obtain a whole core inductive coil measuring apparatus be explored.

13. Paleomagnetism Laboratory

13.1. Laboratory report.

Jay Miller informed SMP that the new cryogenic magnetometer is scheduled for installation 16-20 June, 1996. Software is still under development, but 2-G will deliver this in time. Dismantling of the existing cryogenic magnetometer must take place during the last week of Leg 167. This is forced by time constraints.

In addition new Molspin spinner magnetometers (2) have been purchased and installed at the Leg 165 port call.

Jay Miller reported that the Paleomagnetism Laboratory Working Group suggests that the GSD-1 alternating field demagnetizer needs upgrading. The replacement with a GSD-1 tumbling demagnetizer is strongly suggested (~ \$30 K). Robert Musgrave suggested that a Detech instrument might be a good alternative (~ \$18 K).

13.2. Disposition of the existing cryogenic magnetometer.

During both the Spring and the Fall SMP Meetings very extensive discussions were held on the disposition of the present shipboard cryogenic magnetometer. Below the essence of these discussions is summarized (from Bremen Minutes):

"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 too 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."

Robert Musgrave reported that his enquiry about the disposition of the present Cryogenic Magnetometer was met with a strong favorable sentiment by the Paleomagnetism Community. With this support the SMP discussed this topic in more detail and it was decided that a transfer into a land based facility located at ODP/TAMU would have to consider:

1. Space.
2. Installation costs.
3. Maintenance costs.
4. Technical support.

ODP/TAMU does have available space, but there is no specific funding for this project.

Consultation with Will Sager of TAMU led to the potential solution of the financial aspects of the maintenance and use of the facility. Will Sager will lead a proposal to an appropriate agency that will make this facility operational. The proposal will include costs of installation, maintenance, and also of technical support. User fees for the facility may help to some extent to defray costs.

SMP endorses this development and urges PCOM to approve this transfer in principle. Paleomagnetists are urged to lend support to these plans through co-operation in the proposal process.

Recommendation 96-11

SMP strongly recommends a transfer of the present shipboard cryogenic magnetometer to ODP/TAMU with the understanding that support and maintenance will come from sources external to ODP/TAMU and that future users should contribute to the maintenance of the facility through user fees.

14. Visual Core Descriptions

Terri King reported on the JANUS Steering Committee which held a meeting just prior to the SMP meeting (March 3-4, 1996). She indicated that action on the Visual Core Description initiative is of great priority and that for these reasons the JANUS Steering Committee has sought the agreement of JOI to call a short workshop in College Station on March 29-30, with the specific aim of looking into the way in which this project can be accomplished as soon as possible. This meeting will be chaired by Kate Moran and Russell Merrill and the panel will consist of members of working groups 4b, 5a, SMP, TRACOR, and ODP/TAMU. Of special importance will be to start out with a simple but practical system, that can be further developed as funds and experiences become available. Results of this workshop should be available before the April PCOM meeting.

Russell Merrill presented a brief explanation of an ODP/TAMU proposal for a more elaborate digital imaging system. Such a system would allow, *inter alia*, the incorporation of the aims of the visual core descriptions working group, but the SMP is of the opinion that, especially because of funding considerations as well as the need to get going on this project, the March Meeting in College Station should aim at a lower level start with the Visual Core Descriptions Project. A major reason for this is that the proposed digital imaging system is at this time considered to be much too expensive having a resolution that is well beyond what was necessary for simple core descriptions purposes.

SMP strongly endorses this proposed workshop, which is in essence the logical follow up of the original August 1995 workshop.

Terri King reported that during the JANUS Steering Committee TRACOR was encouraged to continue to work on a program for the VCD, but in which texts are captured in separate, easy accessible file format, so that importation of this text into the VCD template can be executed easily. This method is considered a stop-gap measure and with the development of a new manner of visual core description, TRACOR could, in principle, adapt the data base towards inclusion of the latter.

Kevin Brown reported on the discussions of the TECP of the report of the August Working Group ("Brown Report") and indicated the enthusiastic support for this project by TECP.

Russell Merrill will join Leg 167 with the aim of testing a prototype of his proposed Digital Imaging Project. With the presence of the Alan Mix Color Scanner and the Minolta Camera a thorough comparison of data and compatibilities can be explored. SMP looks forward to the result of these efforts.

Recommendation 9-12

SMP expresses its strong interest in a continued effort to improve the methodology of Core and Structure Descriptions as outlined in the Core Descriptions Workshop Report of August 1995. SMP recommends to PCOM that it also endorses the quick development of this important effort towards modernization of the core description process.

15. Split Core Multi Sensor Track (SC-MST)

SMP received a document prepared by James Allan describing the need for a feasibility study for a split core MST. At present the whole core MST (WC-MST) in its updated and automated version provides excellent, reliable data on unsplit, whole piston cores. The development of a split core MST, however, will allow even more detailed analysis, especially on a much finer millennial scale. A SC-MST also would allow the possibility of introducing a more reliable way of core imaging with the Minolta Camera.

The SC-MST proposal details the following specific advantages:

1. The new SC-MST would combine all of the major functions of the current WC-MST (P-wave velocity, magnetic susceptibility, GRAPE, and natural gamma-measurements) with a color scanning system. SC-MST measurements will be able to be correlated directly with other measurements made on the split sample surface or from direct samples of the core. These include paleontological dates, color spectral data, resistivity (when available in the future), shear strength measurements, index properties, discrete velocity measurements, paleomagnetic measurements, and, of course, visual core descriptions.

2. Significant speeding up of core MST data collection. Acquisition of a SC-MST would allow the functions of two MST systems to be split up, with the WC-MST used to ensure complete stratigraphic coverage by core-core correlation and the SC-MST used for detailed core measurements.

3. Current commercial SC-MST designs are semi-portable, allowing the system to be moved from ship to shore, when the cruise schedule allows. This would allow detailed studies of already existing materials in the ODP core lockers.

SMP notes that the present year's budget (see section below) includes funds for a feasibility study for the SC-MST. Contacts with Peter Schultheiss of Geotek Ltd. have been developed with regards potential testing either on shore or on board the ship, which might help with cost-savings (Leg 169 ?).

SMP considers this an important development, especially with the present interest in the measurement of color (see Section 11), electrical resistivity (see Section 12), and its potential use in the core description process (see Section 14).

16. Prioritization of Potential Cost Items.

16.1. ODP/TAMU Budget Constraints.

All Panels have been requested to make a prioritization in the budget cuts that have to be made to reach the budget reduction from 40.5 to 37.7 million dollars. BCOM then will face the difficult task of making these cuts on March 11-12, 1996.

16.1.1. Tier 1 and Tier 2.

A serious discussion followed, giving particular attention to the ODP/TAMU proposed cuts under Tier 1 and Tier 2.

Whereas SMP was agreeable to most of the cuts in these two tiers, serious concern was raised about the large scale reductions in "support personnel", i.e., student support. Two principal reasons were given:

1. In many cases the need of student support is absolute, such as the work in the core repository and other vital areas. SMP agrees on this matter entirely with IHP.
2. A large number of panel members were against cutting most or all student support in principle. It is the opinion of SMP that ODP/TAMU, even as a facility in the Texas A&M Research Park, should retain strong student support, as the facility is still part of the Texas A&M University.

Indeed student assistance is needed in the core repository, but a typical example in favor of other types of student support is the work carried out for a Masters Degree in Engineering by Patrick Fisseler, who designed and constructed the so-called Fisseler Water Sampler.

SMP argues that student support is important, but agrees that perhaps a cut of 50 % must be effected. It is clearly understood that the difference would mean a larger reduction in the Special Operations Expenses Budget.

Another item of concern to the membership of the panel is the proposal of a 1% reduction in the payroll budget. It is SMP's opinion that this is unnecessarily punitive for a dedicated hardworking staff at the ODP. All means should be sought not to implement this budget reduction. Salary considerations should be consonant with general policies at the Texas A&M University.

16.1.2. SOE Prioritization.

SMP is not able to assess the consequences of the required budget for the current science plan and defers on this issue. However, SMP does suggest that in future planning attention should be given to cost items in these proposed programs.

Under the item "Additional" SMP chose to prioritize first the SMP related items:

1. JANUS Data Base Project.
2. Digital Imaging.
SMP, however, argues here for a reduced form to make it possible to meet costs for it's number one priority, i.e., the Visual Core Description Project. These costs will be assessed during the March 29-30 Workshop at TAMU, but costs will probably be below 150,000 dollars.
3. Split Core Track MST Feasibility Study.
4. Chart Recorders.

5. Split Core MST Purchase (deferable till 1998).

Subsequently a prioritization of the other budget items was made, albeit in a less informed manner. Below SMP presents its overall prioritization:

1. JANUS Project.
2. Digital Imaging - as amended (see above).
If fully funded with disregard of this amendment, SMP argues for a lower classification.
3. Dry Dock.
4. Split Core MST Feasibility Study.
5. Chart Recorders.
6. Hammer Drill Project.
7. Sampling Parties.
8. DCS Phases III and IV (Defer till next year ??).
9. Split Core MST (Defer till next year ??).
10. Co-Chief Review.
11. Reprint Project.

Note: Dollar amounts of 8 through 11 is ~680 K dollars, close to the target, even if 50% student support is included.

16.2. SMP Wish List.

SMP is painfully aware of the need of "down sizing". However, SMP will retain its tradition of making a suggested wish list:

1. Funds for the Core Description Project: See remarks above under item 17.1.2. as well as the Discussion of the core Description Project. Cost to be assessed in the March 29-30 Workshop.
2. XRD Replacement: \$ 150,000 (see Discussion X-ray Laboratory).
3. Tumbling Demagnetizer: 18-30 K dollars (see Paleomagnetism Discussion).

17. **Panel Membership**

SMP discussed the membership of the panel.

Members Terri King (US)
 Janet Pariso (US)

Robin Brereton (UK)

will leave the panel.

Robin Brereton will be replaced by Neil Croston (UK) of the University of East Anglia.

VARIOUS PERSONS ARE PRESENTLY BEING APPROACHED WITH REGARDS MEMBERSHIP. THIS INFO WILL BE AVAILABLE TO THE PCOM PRIOR TO THE APRIL MEETINGS.

SMP wishes to express its appreciation of the services rendered by the above members of the panel. Especially Terri King, who's membership was of short duration, expended her well known energies towards SMP but also to the leadership of the JANUS Steering Committee. SMP will miss these members.

Ron Chaney will serve through the end of this year and thus a replacement for him will be discussed during the next panel meeting.

18. Time and Place of the Next SMP Meeting

SMP proposes to hold a meeting in Japan October 29-November 1, 1996. The meeting will be hosted by Dr. Satoru Nakashima, the distinguished Panel Member from Japan. This meeting is of importance because of a proposed joint meeting with JAMSTEC about the development of shipboard equipment destined for the use on board of the future Japanese Drilling Vessel "Godzilla Maru". The relative late date is caused by the participation of Joris Gieskes in Leg 169 of the Joides Resolution.

The tentative schedule will be:

October 29: Visit to Horiba to inspect their XRF equipment. Visit to Satoru Nakashima's laboratory for a demonstration of the line color scanner camera for core images.
October 30: SMP Meeting at Ocean Research Institute, University of Tokyo
October 31: SMP Meeting at Ocean Research Institute, University of Tokyo
November 1: Joint Meeting SMP-JAMSTEC

This will be the first meeting of SMP in Japan, but because of the interest in the future development of the Japanese Drilling Vessel, this meeting will be of importance to the future of the drilling program.

19. Acknowledgements

SMP is grateful for the full co-operation of the staff of ODP/TAMU. Jay Miller was a gracious host for this meeting.

SMP is particularly grateful for the clear and illuminating presentations of Sara Harris and Peter Jackson on their apparatus. Many of their ideas will be incorporated in the future into the shipboard measurements program.