12th Meeting of the Shipboard Measurements Panel

Las Palmas, Gran Canaria, Spain, September 25-27, 1994

EXECUTIVE SUMMARY

The Shipboard Measurements Panel (SMP) met in Las Palmas, Gran Canaria, Spain, with the chief purpose being a visit to the ship by the panel. In addition to the results of the shipboard visits a number of other important items were discussed.

Information by TAMU/ODP was supplied by Jamie Allan and SMP notes its satisfaction with the good co-operation between the panel and TAMU/ODP in most areas of common concern.

Below the most important items that led to the formulation of specific recommendations are summarized:

1. Multiple Sensor Track (MST)

The MST is considered one of the most important components of shipboard data integration efforts, as discussed in a separate report to PCOM on the meeting of the Core-Log Integration Committee (CLICOM).

SMP notes that the improvements in the mechanics of the MST have been substantial since the last meeting of SMP.

SMP notes, however, that one major problem needs urgent attention: rather than the use of an array of computers, the development of a more centralized workstation is considered of prime importance. In view of the importance of the MST in data integration projects, this becomes a high priority project.

Recommendation 94-7

SMP recommends that ODP/TAMU be encouraged to go ahead as soon as possible with the envisaged upgrade of the MST. Funds have been allocated for this purpose and SMP recommends strongly that special attention be given to a more centralized work station capable of replacing the manifold of computers presently associated with the MST.

2. Cook Books

During the discussion of the shipboard visits it was noted that there is a strong need for the development of appropriate "cook books", detailing routine laboratory procedures in a concise, clear manner. This need is apparent for most other laboratories, particularly XRF, XRD, and Physical Properties.

Individuals of the SMP, ODP/TAMU, as well as sea going scientists, equiped with the

necessary expertise, should participate in the development of these "cook books". These could then be made available to sea going scientists prior to the cruise.

Recommendation 94-8

SMP notes from visits to the ship's laboratories that "cook books" of laboratory procedures are important items that are often missing in the various laboratories. SMP recommends that such "cook books" be developed through co-operation between laboratory users of the appropriate expertise and designated ODP technical staff. SMP suggests that future staffing by ODP may bear this aim in mind, sothat procedure cook books can be developed in the near future.

3. XRF Laboratory

SMP reconsidered its evaluation of the use of the XRF laboratory (c.f., SMP report of the 11th meeting in College Station). As a result of this SMP likes to emphasize its support for the complete use of this facility, to include the analysis of both major and trace constituents of Hard Rocks. The data base gathered, using the equipment in a judiceous manner, is of high quality and its continued use for establishing a first rate data base should be ensured.

Recommendation 94-9

SMP wishes to stress that the X-Ray Fluorescence apparatus on board ship should be utilized to its fullest extent to include a full set of major and trace element determinations. The SMP strongly endorses the proper use of the XRF by the technical staff, with the aim of continuing the collection of high quality major and minor element data, comparable with most competent shore-based laboratories. If experienced XRF scientists sail, then these scientists should assume responsibility for the operation of the XRF, get thoroughly involved in the analyses, and provide guidance and training for the technicians.

SMP also discussed the X-Ray Diffraction (XRD) aspects of this laboratory and suggests that there should be pre-cruise communication about the use of the XRD instrumentation and that experienced XRD scientists should have access to this equipment in collaboration with the ODP technical staff person assigned to the XRD laboratory.

4. Discussion of Software

In the SMP discussions of the data base upgrade the subject of software development was visited. SMP considered the Etch-a-Sketch program and is of the opinion that continued development of it's software is not in the best interests of the program, especially considering the meager software development resources. SMP urges an exploration by ODP/TAMU of the capability of commercially available CAD programs. Any successful exploration of this possibility could also pertain to VCD, Rocky, and, perhaps, Structural Data.

Recommendation 94-10

SMP urges that the further development of Etch-a-Sketch and similar programs be put on hold. SMP considers it of importance that for the capture of data on VCD, Etch-a-Sketch, Rocky, or Structure Data, the capability be explored by TAMU of commercially available CAD programs.

In addition SMP discussed the possibility of none US members to the TRACOR database oversight committee and urges the appointment of at least one other member from the partner countries.

Recommendation 94-11

SMP urges PCOM/JOI to consider the appointment of one extra member of one of the other member countries to the Data Base Steering Committee, having obtained the assurance of active participation in this effort.

5. Data Integration

SMP discussed the report of the socalled Core-log Integration Committee (CLICOM), which was called for by the Chairman of PCOM to give advise in particular on the development of the CLIP program, which has served for data integration purposes during several past (and future) paleoceanographically oriented drilling legs. A separate report has been forwarded to PCOM, but in order to ward of any undue criticism, SMP realizes that this is the beginning of a useful discussion of the subject of data integration, a subject appropriate for further discussion by SMP/IHP.

CLICOM realizes that this report is mainly directed towards consideration of the state of development of the CLIP platform, conform with the directives of the PCOM Chair. However, this report should also serve as a potential basis for future more extensive discussion on data integration. This should be discussed in greater detail by the SMP and IHP panels.

Major SMP related concerns are:

1. The recommendation of CLICOM that, especially on legs in which data integration is expected to play a major role, a careful selection of staff is made, including the appointment of a scientific staff member responsible only for data integration, in close collaboration with other specialists working in this area (MST, PP, Color scanner, paleontology);

2. Dissemination of information with regards the importance of core-core/core-log or, simply, data integration in other legs with sediment and/or hard rock recoveries.

Data Integration is presently most feasible and constitutes a major advance in a subject long advocated, but presently achievable. SMP strongly endorses the further development of the Data Integration Platform (formerly CLIP).

6. Data Base Upgrade

SMP discused the data base upgrade and made suggestions as to the prioritization of Data Categories. The reasoning for this regrouping is based on the observation that data groups that are relatively easy to transform to the new data base ought to receive primary attention sothat these data can enter the new data base in the near future and also to prevent interference with the less readely transferable groups. The SMP realizes that due attention should be given to Group 5, which includes potential visual captures of the categories listed. Some of these programs are still in various stages of development - Fossilist being reasonably advanced, but still by no means finished.

The prioritization is as follows:

Group 1: Corelog, Leg/Site/Hole
SAM and CHEMSAM

Group 2: GRAPE
Pwave
Magnetic Susceptiblity
Natural Gamma
Color Reflectance
Paleomag

Group 3: Thermcon
ADARA
WSTP
Sonic Velocity
Shear Strength
Index Properties

Group 4: XRD/XRF
RockEval / Geofina
Carbon / Carbonate
Gas Chromatography
IW

Group 5: AGE
Sed Descriptions
Paleo Data
Smear Slides
Structures

Group 6: Hard Rock
General Thin sections

Group 7: Tensor /Sonic
UW Geophysics
Seismic
Core Photos

Group 6 "Hard Rocks" is considered a separate category because of special problems associated with hard rock data. Additional development time for this data group will be necessary, but as a data type it is a high priority item despite the relatively low ranking as a group.

7. Software

Fossilist

During the visit to the ship the workings of the program Fossilist were demonstrated. Though the program looks promising, recent testing by shorebased scientists as well as shipboard scientists on Leg 156 has revealed many problems with Fossilist. Ellen Thomas, Dave Lazarus, Annika Sanfilippo, and Bill Riedel have tested Fossilist, but not extensively and much more testing needs to be done in the future. Dave, Annika, and Bill had severe problems with speed; Ellen tested the program on a Quadra and had less problems. Overall, testers agree that the program requires excessive amounts of memory for such a program, and is very slow when run on smaller computers (onboard, the program is run through a server, but users also complained about the speed - i.e., the lack of it). The software holds much promise to become very useful, but it needs a considerable amount of work to become fully operational. It can, in its present state, not be considered fully operational, especially because of several problematic features, such as the loss of data. However, the continued development of Fossilist is a much desired objective.

Recommendation 94-12

SMP recommends that the development of this software continues in the near future. SMP urges that, in order for Fossilist to become operational, due attention be given to inclusion of the prime data fields as defined by IHP/SMP. IHP urges that ODP give first priority to the continued development of Fossilist, sothat the impetus will not be lost and the program will become fully functional in the near future.

Other software

This topic has already been discussed in section 4 of this summary.

7. Shipboard Equipment

In the discussion of Shipboard Equipment it was emphasized that the equipment that is probably the best known on the JOIDES Resolution, i.e., the X-Ray Fluorescence Spectrometer and the Paleomagnetic equipment, is getting old. The equipment is still in reasonably good shape, but in the near future needs replacement. This issue needs attention now, especially in case a breakdown of this equipment will occur. For the Paleomagnetic equipment new equipment can now allow the proper measurement of magnetic properties in carbonate sediments, an area that has hitherto been difficult to access. It should be pointed out that this equipment and its availability on the ship are the quid-pro-quo of a successful drilling program in the future.

8. Next meeting

At present SMP is in contact with both IHP and TEDCOM re a potential spring 1995 meeting (probably in College Station) during which one day overlap with each of these panels should be arranged; one day with IHP to discuss common interests in the data base upgrade, one day with TEDCOM to discuss the potential laboratory arrangements with the Japanese membership with regards the outlay of the Japanese Drilling Vessel.

SMP proposes to meet in Bremen in the Fall of 1995, with the special aim to visit the Bremen Core-laboratory facility. Heinrich Villinger would be the host of that meeting.

Minutes of the 12th Meeting of the Shipboard Measurements Panel

Las Palmas, Gran Canaria, Spain, September 25-27, 1994

Members present
- Robin Brereton (UK)
- Ronald Chaney (US)
- Terri Hagelberg (US)
- Mike Rhodes (US)
- Ellen Thomas (US)
- Jean-Pierre Valet (F)
- Heinrich Villinger (G)
- Dominique Weis (ESF)

Joris Gieskes (US) Chairman

Members absent
- Kate Moran (C)
- Janet Pariso (US)
- Saturo Nakashima (J)

Liaisons
- Jeff Fox - PCOM
- Paul Dauphin - US NSF
- Jamie Allan - ODP/TAMU
- Bill Mills - ODP/TAMU

1. Opening of the meeting

The chairman welcomed all panel members present, with a special welcome to new panel members: Terri Hagelberg and Heinrich Villinger. A special welcome was also expressed to Jeff Fox (PCOM) and Paul Dauphin (US-NSF).

It was deemed appropriate to start discussions with the report of PCOM (Jeff Fox) as things are to be put in the new financial perspectives established recently during the PCOM Meetings.

2. PCOM Report

Jeff Fox reported on relevant issues concerning SMP and PCOM.

Jeff Fox pointed out that presently PCOM has identified 10 basic programs, whose drilling objectives, both in the Atlantic Ocean and the Pacific Ocean, will be met in the near future. He also pointed out that at present there is no obvious fit between the original long range objectives plan and reality. This, of course, is in many ways a healthy situation, but future drilling plans will need careful re-definition, especially for the renewal period of 1998-2002. A major objective of these plans will be more intensive interaction with various international initiatives and an out-reach effort is in progress. Certainly the future program will need to be weighted towards this objective and there is a need to stress "societal relevance" of these programs.

Jeff Fox reported on the cautious approach recommended by PCOM regarding further development of the diamant coring system (DCS), pointing out that much will depend on a further successful land test of this system.

Jeff Fox also informed SMP about an, as yet not completely formulated, approach to Service Panel Membership. This may imply a potential "term-limit" of 4 years for a membership, though exceptions may be granted through consultation with PCOM.

Both Jeff Fox and Paul Dauphin informed SMP on the relatively gloomy financial aspects of the future program. Repercussions with regards SMP objectives are the observations that innovations will be more difficult to achieve. PCOM desires that all panels make careful considerations regarding economies that can be made.

As SMP's main concerns are focussed on the Technical Service aspects of the drilling program, SMP requests more detailed information on the financial structure of the "Technical Services" budget, especially because "economies" can only be discussed against such a background.

3. ODP/TAMU Report

Jamie Allan reported on the activities and status of the shipboard measurements program since the last meeting of SMP.

First of all with respect to the SMP recommendation 94-6 (c.f., minutes of SMP's meeting 11), Jamie Allan indicated that the cuts in technical staff have been rescinded. SMP expresses its strong desire that this type of action not be considered again in the name of "economies". The presence of an adequate Technical Staff (in numbers and quality) is the quid-pro-quo of a successful shipboard measurements program.

Equipment procured or planned for procurement through available funds can be summarized as follows:

1. Improvement in the underway geophysics laboratory;
2. Equipment for real-time navigations;
3. New thermal conductivity heater box (item 3 of previous report);
4. New paleontology microscope (item 2 of previous report);
5. Sun Sparc-5 work station dedicated to data integration;
6. Funds for the upgrade of the MST device (item 1 of previous report);

In addition the following equipment was submitted for consideration by SMP:

1. Rig Instrumentation Project;
2. GC/MS with autosampler for Organic Geochemistry;
3. Upgrade of LASENTEC particle size analyzer;
4. New data integration work stations;
5. XRF pellet fluxer

Jamie Allan pointed out that, while the LASENTEC particle size analyzer is not presently in heavy use, many sedimentologists feel that the data generated by this machine can and should be of significant scientific interest. In legs where use has been heavy (e.g., Leg 152) the data have formed an important part of the sedimentary descriptions and interpretation. Upcoming legs after Leg 158 should have a demand for similar data. The current low level of use principally reflects the fact that the present set-up is difficult to use and the data are hard to manipulate unless someone in the sedimentary group is dedicated to making the machine run. An upgrade to a new PC-2000 model (estimated cost $ 7 300 with trade in arrangement) will make the system easier to use, with electronic data capture allowing direct porting of the data into computerized data sets. At least as important is that the new machine would be smaller, with a one piece optical system, a sturdy base, and much more stable electronics (important in the dirty electrical environment of the ship). Pieces of the equipment which need periodic replacement are also now redesigned with a longer life-span. The laser diode has a life-span ten times that associated with the present model. It is believed that the new system will be both more reliable and easier to maintain. SMP supports the renewal of this equipment.

Jamie Allan also discussed the replacement of the Claisse Fluxer (for XRF glass pellets). The existing Claisse Fluxer is in need of replacement, and attempts to upgrade it have not been successful. ODP is contracting with Tokyo Kagaku Co., Ltd. to either lease their XRF RF coil bead preparation apparatus for 7 months or to purchase it ouright. The lease cost is $ 1 000/month; the purchase price is still uncertain, but may be as low as $ 24 000 (down from $ 65 000). Legs 160-162 provide an excellent opportunity to test the reliability of the apparatus, and its applicability to the shipboard operational environment. Installation of the instrument requires no significant laboratory modifications and provides: 1) excellent analytical reproducibility of bead production; 2) removal of propane from the chemistry laboratory, increasing safety; 3) significant freeing up of scarce technician time, as the machine does not have to be attended to during bead production. The options after the seven month trial period would be to purchase the Tokyo Kagaku model, or to purchase a replacement Claisse fluxer. SMP supports the lease concept strongly, especially this will allow a study of the applicability of this equipment to the shipboard XRF operation.

Items 1, 2, and 4 will be discussed further in this report.

In addition several other major projects were reported on, most of which will be considered in later sections of this report:

1. JANUS computer upgrade project

2. Bremen Repository - Jamie Allan presented a brief discussion of ODP/TAMU's involvement;

3. Status of Fossilist;

4. Etch-a-Sketch;

5. MST upgrade;

6. Bremen Resistivity Tool - this apparatus has arrived at ODP in the interim and will be set up in the near future. Preliminary results should be available at the next SMP meeting.

7. Structural Data Capture;

8. Explanatory Notes;

9. Laboratory Manuals.

4. Visit to Ship Laboratories

During the afternoon of Sunday September 25 the panel visited the ship:

1. 1:30 -3:00 - general tour;

2. 3:00 - 4:30 - individual visits.

The visit to the ship was most intructive and served well as the basis of an evaluation of the state of shipboard measurements on the JOIDES RESOLUTION.

After the visit to the ship the panel reconvened and each member was polled with regards their observations. Some of these are summarized below:

4.1. Multiple Sensor Track (MST)

SMP notes that the improvements in the mechanics of the MST have been substantial since the last meeting of SMP.

SMP notes, however, that one major problem needs urgent attention: rather than the use of an array of computers, the development of a more centralized workstation is considered of prime importance. In view of the importance of the MST in data integration projects, this becomes a high priority project.

Recommendation 94-7

SMP recommends that ODP/TAMU be encouraged to go ahead as soon as possible with the envisaged upgrade of the MST. Funds have been allocated for this purpose and SMP recommends strongly that special attention be given to a more centralized work station capable of replacing the manifold of computers presently associated with the MST.

In addition it was noted that there is a strong need for the development of an appropriate "cook book", detailing routine laboratory procedures in a concise, clear manner. Incidentally this need is also apparent for most other laboratories, particularly XRF, XRD, and Physical Properties.

Individuals of the SMP, ODP/TAMU, as well as sea going scientists, equiped with the necessary expertise, should participate in the development of these "cook books". These could then be made available to sea going scientists prior to the cruise.

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SMP notes from visits to the ship's laboratories that "cook books" of laboratory procedures are important items that are often missing in the various laboratories. SMP recommends that such "cook books" be developed through co-operation between laboratory users of the appropriate expertise and designated ODP technical staff. SMP suggests that future staffing by ODP may bear this aim in mind, sothat procedure cook books can be developed in the near future.

4.2. Paleomagnetics laboratory

The paleo magnetics laboratory has not changed in recent times, but SMP notes that the time has come for major renovations and improvements in the laboratory. Below follows a memo on this matter from SMP member Jean-Pierre Valet:

The major instrument of the paleomagnetic laboratory on board the ship is the 2G cryogenic magnetometer for measurements and demagnetization (in line with the magnetometer are three AF demagnetization coils) of whole sections of sediment. The lab is also equiped with a spinner magnetometer (Molspin) and a Schonstedt demagnetizer for measurements and demagnetization of single samples. Some other instruments have been acquired to perform rock magnetic analyses (electromagnet, coils for anhysteretic remanence). The most recent acquisition is a kappabridge for the anisotropy of magnetic susceptibility. Although at first glance these different pieces of equipment seem to be appropriate, there are still problems regarding the acquisition of the basic data set required for magnetostratigraphy.

The Molspin spinner magnetometer offers the possibility of measuring single paleomagnetic samples. However, this instrument was originally designed for field work; it has a very limited sensitivity and, therefore, poor capability for measuring sediments with magnetization intensities lower than 10^{-6} A/m (i.e., in fact most sediments after demagnetization in low peak alternating fields). In addition, it is extremely time consuming (about 10 minutes per sample). In principle, the 2G cryogenic magnetometer could be used also to measure single samples but the performances are even lower than with the Molspin. Indeed, the pick-up coils were designed for long core measurements with a large volume of sediment within the sensitive region while typical single samples have a small volume and thus induce a much weaker signal; in addition, they are also further away from the sensors. In the present configuration it is thus not possible to perform fast and accurate measurements of single samples while this is crucial for magnetostratigraphy and other shipboard studies. Measurements of strongly magnetized rocks can be done with the Molspin but they are very time consuming.

The demagnetization is a fundamental aspect of the shipboard measurements. Demagnetization of cores is performed with the alternating fields coils mounted in line with the magnetometer. It must be performed in zero field and for this reason the AF coils are surrounded by shields that attenuate the external magnetic field; however, there is still a significant residual field that eventually can induce spurious components of magnetization instead of demagnetizing. It is not possible to demagnetize higher than 15-20 mT with a good confidence. Shielding is critical also for the measurements. The bad attenuation of ship motions induces a significant drift that affects the signal/noise ratio and reduces considerably the performances of the magnetometer. There are many reports of scientists who could not perform measurements because the noise level and the drift of the magnetometer were too high; there has been a very large number of noisy records for this reason. The final consequence is, that for many legs the data acquisition and the final paleomagnetic records could have been much better with major consequences for stratigraphy,

time scales, and any other subsequent study.

Besides these technical aspects it must be emphasized that the software of the cryogenic magnetometer has always been a problem. Improvements have been attempted by successive shipboard scientists since leg 101. There is an overall agreement that the present version is very long, not flexible, does not provide the possibility of plotting the results and requires a substantial amount of work to transfer data with an appropriate format into other computers (vax and macs). It is clear that the software should be reconsidered and rewritten.

As a conclusion the present system on board, although operative, is far from working under the best conditions. One possibility would be to replace or modify items that are critical. This would not yield major improvements, particularly for measurements of single samples and weakly magnetized sediment cores because the geometry of the system would essentially remain the same.

The ODP system was the first long core magnetometer built by 2G ten years ago. Since then the company has delivered 7 other long core magnetometers and 42 discrete sample rock magnetometers. This experience has led to significant improvements in operation, sample handling and reliability. Should the company replace the ODP system at the present time, the sensitivity of the magnetometer would then be increased by almost a factor of 100 (allowing any kind of measurement). The company would provide also a different geometry of the pick-up coils optimized for half cores and discrete samples. Among other significant performances, demagnetization would be possible in much higher fields up to 150 mT. The field attenuation would be considerably improved by a factor of 50 and, therefore, the drift reduced quite significantly. The run time per fill would be much longer (40 months instead of 10 months). A direct consequence is that the expenses inherent to the helium fills (travel and per-diem costs from California for one member of the company, maintenance of the equipement, liquid helium ..) would be four times lower. Because this is a new system the software would have to be rewritten anyway. Several laboratories equiped with long core systems could now provide a significant input on this aspect.

It is quite clear that most, if not all the problems would be solved after replacement of the present system. According to 2G a new magnetometer for ODP could be delivered in about 12 months from receipt of the order. It would be installed in place of the present magnetometer in a 5 days port call.

SMP concurs with this evaluation and urges attention to such items of equipment renewals.

A "cook book" does exist for the paleomagnetics laboratory. This book describes how data aquisition and standard data processing in the paleo-lab works. However, this book needs constant updating through collaboration between shipboard scientists and technicians (c.f., Recommendation 94-8).

4.3. Paleontology Laboratory

SMP notes that many improvements (especially as to handling of microscope parts, presence of literature in the laboratory, and inventorization of supplies) have been made in this laboratory through the useful interaction between ODP/TAMU and SMP. The new paleo-microscope has been purchased and will constitute a valuable addition to this laboratory.

John Firth demonstrated the program FossiList and progress is considered promising. Fossilist will be further discussed in Section 9 (Software) of this report.

4.4. XRF and XRD Laboratory

SMP is pleased to note that the software for the XRF has been vastly improved.

An interesting problem still remains as to what philosophy should drive the use of the XRF. Should emphasis be placed on complete analyses of samples or should more attention be payed to special analyses. After some discussion it was decided that the SMP stance as expressed in the minutes of the 11th meeting of SMP remain valid. Below follow some of the essentials of that report:

ODP Mission Statement for Shipboard XRF Analysis of Igneous Rock Samples:

1. The shipboard XRF is used primarily to aid in mapping and sampling of the core. The XRF data should be used in conjunction with other shipboard data sets in making drilling decisions. Like other shipboard data sets, it should never be used in isolation for these purposes.

2. The shipboard XRF data set produced must be of consistently high archive quality, comparable leg to leg, as has been repeatedly endorsed by SMP. Historically, the shipboard XRF data set is not reproduced by shore base studies on a one to one basis; instead, the shipboard data set has generally proved to be the foundation of subsequent geochemical studies, with shore based studies most often serving as supplements to the original data set. This data set is of the greatest value to the community when it includes a full set of major and trace element determinations; therefore, the policy of ODP is that all submitted igneous samples for XRF analyses be analyzed for both major and trace element compositions.

3. To ensure a consistent and historically valuable data set, the sample preparation procedures and analytical methods must be consistent leg to leg, recognizing that standards and calibration curves used may vary leg to leg depending on the materials analyzed.

4. Due to the labor intensive needs of this analytical method and the hostile operating environments, scientific parties should expect on the order of 80-120 major and trace element determinations per leg. If the XRF undergoes a cold start or a complete recalibration at the beginning of the leg is warranted, scientific parties should understand that analyses will not become available until at least two weeks into the cruise. Sample turnaround times will be improved if members of the scientific party assist in the sample preparation.

In addition to the above mission statement of ODP, the following points were considered:

1. Like other shipboard data sets, the SMP has stressed the need for the shipboard XRF data set to be complete in nature, consistent in archive quality, and to be obtained through consistent and careful analytical means. The SMP has historically stressed that the XRF data set is collected as a legacy for the entire community; therefore, its quality and completeness should not be compromised.

2. The XRF analytical procedures have been developed in conjunction with the SMP to ensure consistent, high quality analyses in a physically and environmentally challenging analytical environment.

3. ODP is examining the initial rock preparation procedures to see if other preparation techniques can be instituted without sacrificing consistent data quality. ODP notices that speeding up will not appreciably affect the total number of analyses available per cruise, as machine calibration, weighing of samples, preparation of beads, and sample counting time constitute the great majority of overall analysis time.

A lively discussion followed on the above items and, notwithstanding a sympathy with some of the concerns of the Leg 152 petrologists, it was decided that present procedures should be maintained. In essence the issue is a philosophical one, in that XRF specialists will desire to rerun samples, whereas many other scientists wish to use the shipboard information in a direct manner. The SMP endorses the proper use of the XRF by the

technical staff, with the aim of continuing the collection of high quality major and minor element data, comparable with most competent shore-based laboratories. If, on the other hand, experienced XRF scientists sail, then these scientists should assume responsibility for the operation of the XRF, get thoroughly involved in the analyses, and provide guidance and training for the technicians. In addition there should be a guarantee in that case that follow-up work of at least the same quality as the shipboard program will appear in the data base. For most legs, however, the established procedures should be stricly adhered to. SMP proposes further discussion of this item during the next meeting of SMP.

The SMP wishes to stress that the important quid-pro-quo for a the rigorous maintenance of the XRF program is the maintenance of a dedicated, well trained XRF technician, who should spend most of his/her time on the maintenance, standardization, and running of the XRF equipment, particularly during hard rock oriented legs.

Recommendation 94-9

SMP wishes to stress that the X-Ray Fluorescence apparatus on board ship should be utilized to its fullest extent to include a full set of major and trace element determinations. The SMP strongly endorses the proper use of the XRF by the technical staff, with the aim of continuing the collection of high quality major and minor element data, comparable with most competent shore-based laboratories. If experienced XRF scientists sail, then these scientists should assume responsibility for the operation of the XRF, get thoroughly involved in the analyses, and provide guidance and training for the technicians.

SMP also discussed the X-Ray Diffraction (XRD) aspects of this laboratory and suggests that there should be pre-cruise communication about the use of the XRD instrumentation and that experienced XRD scientists should have access to this equipment in collaboration with the ODP technical staff person assigned to the XRD laboratory.

Again this necessitates the creation of an appropriate "cook book".

4.5. Physical Properties Laboratory

The visit to the Physical Properties (PP) Laboratory informed SMP about the vast improvements made by the ODP Technical Staff in this laboratory. In particular SMP expresses its satisfaction with the newly developed split-core track for PP measurements. The lab-view equipment represents a useful improvement.

Some potential problems were noted that will need attention:

1. Manuals are still in various states of development;

2. The Hamilton Frame still has problems and essentially needs two systems, one for soft sediments, one for hard sediments. These concerns have been communicated to Bill Mills;

3. For the MST track it was noted that it would be useful to record derived water contents.

One problem arises with the PP/MST laboratory and that is the rapid turn over of personnel. The question was asked if it might not be better to recruit technical personnel, who

have experience or training in geotechnical property studies or in information science.

4.6. Chemistry Laboratory

SMP is satisfied with the operation of the chemistry laboratory. A manual exists for Inorganic Geochemical Analyses, but progress on this is still required in the Organic Geochemistry manual.

With regard the expression of gas concentrations in sediments much improvement is required, especially because it is of interest to estimate these gas concentrations in a more quantitative manner. The purchase of a new gas-chromatograph has made more accurate estimates of gas concentrations possible. The chair of SMP will approach several Organic Geochemists with extensive shipboard experience with regards this problem.

5. Data Base Upgrade

Terri Hagelberg updated SMP on the state of the Data Management System (JANUS Project). In April 1994 TRACOR was selected as the vendor and a Steering Committee (Brian Lewis, Chair) was created to serve as a contact between TRACOR Company, ODP/TAMU, and the user community. Terri Hagelberg is the SMP representative. This steering committee met on September 13 and 14 and established some primary needs in which SMP and IHP can play an important role:

1. Data Attributes Evaluation;

2. Prioritization of Data Categories

3. Evaluation of Equipment Needs

5.1. Data attributes

Data attributes are due as soon as possible and SMP members are requested to respond to information on this matter from the list server set up by Carla Moore (IHP; Steering Committee) for this purpose (See Appendix I).

Patrica Fryer (IHP) has communicated with Brian Lewis on this issue (Appendices II and III) and SMP agrees to act jointly with the IHP in this matter.

5.2. Data Categories

SMP reviewed the ranking and grouping of data categories as proposed originally by TAMU personnel (John Coyne et al.).

Bill Mills provided information on existing data capture software. There have been new developments making use of lab-view and 4D, especially in the Physical Properties Laboratory. This led to the consensus that MST and Physical Property data will require little software development, if any, for basic data capture. Hence the high ranking of these groups.

There was considerable subsequent discussion on the ODP/TAMU ranking and it is the

consensus of SMP that data groups that require minimal or no software development should be entered into the data base first. This will provide the science community with a tangible data base product and at the same time it will allow for significant development time of the more complicated data groups. With groups 2 and 3 accomplished the new data base can be used for most core-core and core-log integration purposes. This ranking will also allow sufficient development time for those data that require new data entry / data capture software (e.g., Fossilist, VCD, Rocky, Etch-a-Sketch or similar programs - see also below). The panel chair was informed by Kevin Brown of TECP that there is existing software for the structural information capture. SMP endorses its use by shipboard scientists until it will be incorporated in the new data base (see Appendix IV).

The reasoning for this regrouping is, therefore, based on the observation that data groups that are relatively easy to transform to the new data base ought to receive primary attention sothat these data can enter the new data base in the near future and also to prevent interference with the less readely transferable groups. The SMP realizes that due attention should be given to Group 5, which includes potential visual captures of the categories listed. Some of these programs are still in various stages of development - Fossilist being reasonably advanced, but still by no means finished.

The prioritization is as follows:

Group 1: Corelog, Leg/Site/Hole
SAM and CHEMSAM

Group 2: GRAPE
Pwave
Magnetic Susceptiblity
Natural Gamma
Color Reflectance
Paleomag

Group 3: Thermcon
ADARA
WSTP
Sonic Velocity
Shear Strength
Index Properties

Group 4: XRD/XRF
RockEval / Geofina
Carbon / Carbonate
Gas Chromatography
IW

Group 5: AGE
Sed Descriptions
Paleo Data
Smear Slides
Structures

Group 6: Hard Rock
General Thin sections

Group 7: Tensor /Sonic
UW Geophysics
Seismic
Core Photos

Group 6 "Hard Rocks" is considered a separate category because of special problems associated with hard rock data. Additional development time for this data group will be necessary, but as a data type it is a high priority item despite the relatively low ranking as a group.

SMP considered the Etch-a-Sketch program and is of the opinion that continued development of it's software is not in the best interests of the program, especially considering the meager software development resources. SMP urges an exploration by ODP/TAMU of the capability of commercially available CAD programs. Any successful exploration of this possibility would also pertain to VCD, Rocky, and, perhaps, Structural Data.

Recommendation 94-10

SMP urges that the further development of Etch-a-Sketch and similar programs be put on hold. SMP considers it of importance that for the capture of data on VCD, Etch-a-Sketch, Rocky, or Structure Data, the capability be explored by TAMU of commercially available CAD programs.

Heinrich Villinger suggested that results published in the Scientific Results Volumes also be made part of the data base in a straightforward manner. This, of course, should be one of the main aims and indeed much of the age information will be of a post cruise nature.

In addition Heinrich Villinger suggested that it would be appropriate to appoint at least one actively participating representative of the other member countries to the Steering Committee. SMP agrees with this concept.

Recommendation 94-11

SMP urges PCOM/JOI to consider the appointment of one extra member of one of the other member countries to the Data Base Steering Committee, having obtained the assurance of active participation in this effort.

SMP members are urged to consult the list-server and to contribute to "data attributes" in their respectives areas of expertise. This needs to be done as soon as possible, particularly because the TRACOR contract starts in early October, 1994.

5.3. Equipment needs

Terri Hagelberg made a survey of available computers on board ship and noted that of the 62 Macintosh computers on board only 8 are Centris 650 or later models. As many of these Macs are used primarily for data extraction/manipulation as well as report generation, there is a need to upgrade these Macs, preferably to PowerMacs or upgrading the present Macs and then providing them with X-window capabilities.

6. Data Integration

Joris Gieskes reported on the results of the socalled Core-Log Integration Committee (CLICOM) at Oregon State University (August 15, 16 1994).

The principle objective of this meeting was to advise PCOM on the status of CLIP (Core-Log Integration Platform) developed by Terri Hagelberg and Peter deMenocal.

A separate report to PCOM has been issued on this subject. Of importance to the series of name changes that have been associated with the Committee responsible for the evaluation of the CLIP program (CLICOM) is the observation that, at present, core-log integration is still a future ideal, and that the subject would be better described in terms of Data Integration (or Shipboard Data Integration - SDI).

Below follows an excerpt of this report:

"3. Concept of core-log integration

In principle core-log integration has been a much desired goal ever since coring and logging operations have been carried out during DSDP/ODP. However, major systematic efforts have only been initiated during ODP Legs 138, 145, 150, and 154, emphasizing core-core integration during paleoceanographic legs. Efforts towards core-log integration during hard rock legs have been initiated during ODP Leg 135.

The main scientific goals of core-log integration are considered to be, *inter alia*:

-- core-core correlation between multiple holes

-- log-log correlation between multiple holes for stratigraphic correlation

-- core-log integration in single holes in order to obtain the correct depth of the cores (important for hard rocks)

-- core-log correlation in single or multiple holes to assess the influence of *in situ* conditions on the physical properties of rocks

CLICOM recognizes that at this stage the concept of "core-log integration" takes two forms:

Core-core correlations for paleoceanographic purposes and core-log correlations for hard rock orientation purposes. These different types of correlations are very distinct in their aims and methodologies. The former is basically data integration, stitching together multiple APC cores for paleoceanographic purposes, whereas the latter is closer to true core-log integration (as originally envisaged), usually (but not exclusively) in intervals of incomplete recovery for the purpose of reconstructing lithological sections, and placing core in its original vertical and/or azimuthal position.

Core-core and core-log integration for paleoceanographic purposes:

Core-core data correlatios are necessary in near-real time for operational purposes.

For this purpose the shipboard core-log integration platform (CLIP) has been developed by means of a

collaborative effort between Terri Hagelberg and Peter deMenocal.

As the original mandate to CLICOM was a review of the shipboard core-log integration platform (CLIP), used during paleo-legs, the meeting started with a presentation by Peter deMenocal on the present status of CLIP. Further details are also presented in Appendix 1 of this report.

Hard rock core-log integration:

Hard rock core-log integration does not require the immediacy necessary for the core-core integration described above and can be accomplished at the end of the cruise or on shore. This type of correlation has been initiated by Christopher MacLeod (Proceedings ODP, Scientific Results, v. 135 (1994)). Below we present a summary of the status of this type of core-log integration."

Though core-core data integration is presently feasible through CLIP, future programming will focus on core-log integration, leading to an overall consistent data integration.

Below a summary and some recommendations of CLICOM (SDICOM) are summarized:

Summary and Recommendations

Based on the discussions CLICOM recommends:

1. The CLIP program, developed by Peter deMenocal in collaboration with Terri King Hagelberg, after extension of this program in the future, will be an important feature of data integration efforts. CLICOM realizes that the CLIP program is still in a development stage and can be made available to shipboard scientists, especially for core-core data integration However, CLICOM is satisfied about the future prospects of the CLIP platform and, therefore, CLICOM recommends that CLIP be recognized as an important component of the future data base update and that the future contractor remain in full contact with BRG-LDEO with regards the future implementation of this program;

2. CLICOM agrees and recommends that a very careful record be kept of depth changes achieved during the manipulations necessary to reach the common depth scale of cores and logs and that each Initial Report of ODP contain a separate chapter on core-log integration or any other Shipboard Data Integration (SDI) effort;

3. CLICOM recommends the maintenance on board ship of three work stations available for dedicated data integration, especially during drilling legs in which core-log integration plays a major role:

    1. In the core laboratory;

    2. In the scief scientists office;

    3. In the library.

4. With the Multiple Sensor Track (MST) being one of the most important component of SDI CLICOM recommends that attention be given to:

    1. Dedicated technical support through a well trained ODP MST specialist;

    2. Dedicated future support for continued further software and hardware development (MST track improvements).

5. Though staffing of a cruise, during which core-log integration is envisaged to be of importance, is usually done

in collaboration with the co-chief scientists of that cruise, CLICOM recommends special attention to the following aspects of this staffing:

Shipboard data integration requires the co-ordination by a dedicated Shipboard Data Integration Specialist, who will have the sole responsibility to carry out the shipboard program of data integration, in collaboration with scientists operating the MST, the physical property experts, as well as shipboard biostratigraphers, paleomagnetists, chemists, and, of course, the logging specialists. The Shipboard Data Integration Specialist will end up defining the depth scales - working together with all other shipboard scinetists to confirm/validate and even constrain depth scales.

CLICOM realizes that this report is mainly directed towards consideration of the state of development of the CLIP platform, conform with the directives of the PCOM Chair. However, this report should also serve as a potential basis for future more extensive discussion on data integration. This should be discussed in greater detail by the SMP and IHP panels.

Major SMP related concerns are:

1. The recommendation of CLICOM that, especially on legs in which data integration is expected to play a major role, a careful selection of staff is made, including the appointment of a scientific staff member responsible only for data integration, in close collaboration with other specialists working in this area (MST, PP, Color scanner, paleontology);

2. Dissemination of information with regards the importance of core-core/core-log or, simply, data integration in other legs with sediment and/or hard rock recoveries.

Data Integration is presently most feasible and constitutes a major advance in a subject long advocated, but presently achievable. SMP strongly endorses the further development of the Data Integration Platform (formerly CLIP).

7. Discussion of future Instrumentation

SMP considered several items that can potentially be added to the shipboard equipment or should be considered as replacement of existing equipment on board ship.

7.1. Rig Instrumentation Equipment

The engineering Staff of ODP/TAMU has forwarded a proposal for a renewal of presently available Rig Instrumentation Equipment, which will allow an assessment of Rate of Penetration (ROP) and Depth Parameters, data which should, in principle, be usefiul for future attempts at core-log integration, whether in hard rock or soft rocks (sediments). Appendix V provides a summary of this proposal.

In principle, SMP agrees that such information is useful for core-log integration purposes. It should, however, be pointed out that hitherto relatively little use has been made of presently available equipment. In addition the costs are by no means low, as is evident from the cost estimate in Appendix V. This matter, of course, led to some debate and it was decided that further enquiries and consultations are necessary with thematic panels and TEDCOM. The chair of TEDCOM and also Chris MacLeod, who is interested in hard rock core-log integration problems

will be asked to provide their opinions on this subject.

7.2. GC/MS for organic geochemistry

Brad Julson (ODP/TAMU) presented a proposal to extend the capabilities of the organic geochemistry laboratory to include a bench-top Gas Chromatograph/Mass spectrometer (GC/MS), which will allow the evaluation of the organic matter contained in the sediments. At present lower hydrocarbons (usually obtained from "head space" sampling) are analysed by means of gas chromatographs, whereas higher order hydrocarbons and more complex organic matter are analyzed by means of the Rock-Eval or Geofina apparatus. This equipment, of course, is mostly intended for source rock analysis and the addition of a bench top GC/MS would extend the capabity of the Organic Geochemists to further characterise the organic matter in the recovered materials. A wish for this type of equipment has been expressed by many shipboard organic geochemists.

SMP expresses a willingness to give further consideration to this rquest, after due consultation with several organic geochemists, who have sea-going experience on the JOIDES RESOLUTION.

7.3. Paleo-Magnetic Equipment

Jean-Pierre Valet reiterated his point that the time has come to give serious consideration to an equipment renewal in the Paleo Magnetics Laboratory. Here reference is made to section 4.2. of these minutes.

7.4. XRF

SMP wishes to go on record that the existing XRF equipment, while in good working order at present, will need renovation at some time in the future. Replacement costs should be investigated, but in view of the high priority of having a functional XRF/XRD laboratory on board ship, it will be imperative to plan ahead for the eventuality of a needed replacement of present equipment.

8. Equipment Needs

The following equipment should be should be considered as necessary for shipboard measurements. These items are part of the wish list of SMP.

8.1. MST related Workstations for Data Integration

SMP considers SDI (Shipboard Data Integration; c.f., section VI of these minutes) a high priority item for further development. As was pointed out in the CLICOM report, it is highly desirable to expand the number of work stations and for these reasons SMP recommends strongly the purchase of one Spark 20 staion for the core laboratory ($ 15K) and one Spark - 5 Station ($ 10K), which can be used elsewhere on the ship by the data integration specialist.

8.2. Bartington Time Attenuator Module

For a better functioning of the MST susceptibility system it will be necessary to purchase a Bartington 4X Integration Time Attenuator Module with the MS2 Susceptibility system.

ODP/TAMU is presently investigating this problem and, if no incompAtibilities with the present software control are found, SMP SMP purchase of this relatively low cost item ($ 1.5K).

8.3. Hamilton Frame

SMP recommends the extension of the Hamilton frame to obtain a more versiaile method using two modules (hard and soft rocks-sediments).

In summary SMP recommends purchase of the following items:

1. MST work stations	$ 25 000
2. Attenuator Module	$ 1 500
3. Hamilton Frame extension	$ 3 000

9. Software

The following software items were discussed by the SMP:

9.1. Fossilist

Recent testing by shorebased scientists as well as shipboard scientists on Leg 156 revealed many problems. Ellen Thomas, Dave Lazarus, Annika Sanfilippo, and Bill Riedel have tested Fossilist, but not extensively and much more testing needs to be done in the future. Dave, Annika, and Bill had severe problems with speed; Ellen tested the program on a Qudra and had less problems. Overall, testers agree that the program requires excessive amounts of memory for such a program, and is very slow when run on smaller computers (onboard, the program is run through a server, but users also complained about the speed - i.e., the lack of it). The software holds much promise to become very useful, but it needs a considerable amount of work to become fully operational. It can, in its present state, not be considered fully operational, especially because of several problematic features, such as the loss of data.

Several major areas of problems with Fossilist have been identified an are summarised in Appendix VI.

Recommendation 94-12

SMP recommends that the development of this software continues in the near future. SMP urges that, in order for Fossilist to become operational, due attention be given to inclusion of the prime data fields as defined by IHP/SMP. IHP urges that ODP give first priority to the continued development of Fossilist, sothat the impetus will not be lost and the program will become fully functional in the near future.

9.2. Barcode reader for SAM.

Barcode labels are currently being produced from CORELOG (ODP core inventory base), DEPTHDECK (DSDP version of CORELOG) and SAMPLE (ODP sample inventory database), as well as the ODP sample data entry programs MUDLOG and REPSAM. The labels can be produced both in real time during core processing as well as at any time after sampling data have

been entered. Unfortunately, the S 1032 data bAse (used fior CORELOG and DEPTHDECK) and the Viking forms software (used for MUDLOG and REPSAM) do not allow for direct input from a barcode scanner. As such TAMU does not yet have a routine working system onboard ship for reading barcode labels; this will likely be one of the first data input modules programmed in the JANUS (data base upgrade) project.

SMP urges urgent attention to this and also suggest the investigation of moveable handheld barcode scanners, which make operations in the core-laboratory much easier.

9.3. Rocky.

SMP recommends continued attention to the development of Rocky by ODP. SMP realizes that this will need collaboration with data base experts at TRACOR, but SMP is of the opinion that this be done as soon as possible so as not to drop it's interest in the development of Rocky. In addition, of course, the use of commercially available programs (Recommendation 94-10) should be explored.

9.4. Etch-a-Sketch.

See section 5.2 and Recommendation 94-10.

9.5. Structural data

SMP has been informed of the TECP's interest in the development of appropriate software for structural data information capture. SMP encourages Kevin Brown, the designated liaison to SMP from TECP to keep SMP informed on these matters, sothat a proper discussion can be held during the next SMP meeting.

X. Other items

Jamie Allan reported progress on three topics discussed during SMP Meeting 11:

1. Job descriptions - these will be distributed for comments to SMP members according to their expertise

2. Generic Explanatory Notes - these will be distributed for comments to SMP members according to their expertise

3. Library of Manuals - Jamie Allen provided a list of Technical Notes available from ODP/TAMU which are of relevance to SMP. In addition a list of equipment manuals available at ODP has been made. This information is appended as Appendix VI.

XI. Membership

SMP is aware of the desirability of periodic renewal of the panel membership.

In 1994 four people made their fresh appearance to the Panel:

Joris Gieskes (US), Chair	Geochemist
Saturo Nakajima (J)	Sedimentologist, Color expert
Terri Hagelberg	Data Integration Specialist
Heinrich Villinger (G)	Geophysicist (DMP experience)

The following persons have indicated the potential need for replacement:

Mike Rhodes (US)	Petrologist/XRF
Dominique Weis (ESF)	Petrologist/XRF
Ellen Thomas (US)	Paleontologist

In addition it is understood that

Jean-Pierre Valet (F)	Paleomagnetist

will be replaced during the year 1995 by a French structural geologist as suggested in the Minutes of SMP Meeting 11.

The present and future membership (names suggested below) will be:

Geochemist	Joris Gieskes (US), Chair
Geochemist, Color expert	Saturo Nakashima (J)
Data Integration Specialist	Terri Hagelberg
Geophysicist (DMP experience)	Heinrich Villinger (G)
Paleomagnetist	Janet Pariso (US)
Petrology/XRF	Suggested:
	Joel Sparks (presently on Leg 158)
	Mike Perfit (US)
Paleontology	Suggested:
	Lucy Edwards (US)
	Dave Harwood (US)
Sedimentologist	Massimo Sarti (ESF)

Physical Properties	Kate Moran*
	Ron Chaney (US)
	Robin Brereton (UK)
Structural Geology	To be named (F)

* Need input from CANAUS

This panel membership should cover the various areas of expertise to advise JOIDES PCOM on Shipboard Measurements related matters.

Liaison with DMP was discussed. It was decided that such liaison would be beneficial to the panel, but that two potential liaisons would be a proper idea, if anything to reduce travel time of these liaisons. Heinrich Villinger (D)was pesuaded to be the first liaison to DMP, especially because he has extensive experience with that panel. Ron Chaney (US) will act as the other liaison.

XI. Future Meetings

At present SMP is in contact with both IHP and TEDCOM re a potential meeting (probably in College Station) during which one day overlap with each of these panels should be arranged, one day with IHP to discuss common interests in the data base upgrade, one day with TEDCOM to discuss the potential laboratory arrangements with the Japanese membership with regards the outlay of the Japanese Drilling Vessel (DV. Godzilla ?).

SMP proposes to meet in Bremen in the Fall of 1995, with the special aim to visit the Bremen Core-laboratory facility. Heinrich Villinger would be the host of that meeting.

APPENDIX I

(Sept 22, 1994)

ANNOUNCING THE CREATION OF

a listserver for IHP/SMP discussions of data issues for the ODP database upgrade

"odpdata_forum@ngdc.noaa.gov"

You have already been subscribed to the odpdata_forum list

As a subscriber, you will automatically receive copies of all postings to the odpdata_forum list via email. Any messages that you send to the address: odpdata_forum@ngdc.noaa.gov will be broadcast to all members of the list - so please make sure that your comments are intended for the entire IHP/SMP group.

You can receive more information on listserver commands available by sending email to

"listproc@ngdc.noaa.gov"

with a body (beginning in column 1) containing the following:

HELP

If you have any problems or additional questions about subscribing, posting, etc. please send questions/comments to:

cjm@ngdc.noaa.gov (Carla Moore, NGDC/WDCA for MGG 303-497-6339)

OTHER INFORMATION SOURCES POSTED AT NGDC

In addition to this listserver for active discussion of issues related to the database upgrade, there is also a Mosaic home page available that will be continuously updated with copies of the latest versions of data type rankings, parameter descriptions, etc. The URL of this page is:

http://www.ngdc.noaa.gov/mgg/odp/forum.html

Copies of original (pre-upgrade) data definitions for the prime data types are also available on this page for review. These and other files can be accessed via NGDC's anonymous ftp server and gopher server, as well:

ftp server: ftp.ngdc.noaa.gov
see directory MGG/geology/odp/FORMATS and odp/lists

gopher: gopher.ngdc.noaa.gov
choose Marine Geology & Geophysics
then choose Marine Geology
then choose odp
then choose FORMATS or lists

APPENDIX II

Content-Type: text/plain; charset="us-ascii"
Date: Tue, 6 Sep 1994 08:33:25 -1000
To: jgieskes@ucsd.edu (Joris Gieskes 619-534-4257)
From: patty@mano.soest.hawaii.edu (Dr. Patricia Fryer)
Subject: Re: Steering Committee for Computer/database upgrade

Dear Joris,

The following is your copy of a letter I just sent to Brian Lewis on behalf of IHP:

****
To: Brian Lewis, Chair, ODP Database Upgrade Steering Committee

From: Patricia Fryer, Chair, ODP Information Handling Panel

Subject: Cooperation between IHP, SMP, and the ODP Computer Upgrade Steering Committee

At the August meeting of IHP, Russ Merrill expressed concern on behalf of John Coyne about TAMU's receiving input from both the IHP and the newly established steering committee for the computer upgrade project. IHP would like to establish its position with regard to this matter in hopes of preventing delays that any perceived conflict might cause.

1. IHP fully endorses the mandate of the steering committee to act as the direct JOI/JOIDES guiding group for both TAMU's Information Services Group (ISG) and Tracor with regard to the computer/database upgrade project. IHP recognizes considerable overlap in the mandates of the IHP and the steering committee with regard to data policy and data handling, but has full confidence in the ability of the steering committee to convey IHP's wishes to TAMU and Tracor with regard to the upgrade project. TAMU should in no way feel that it is circumventing the IHP by following the guidance of the steering committee the during the upgrade process.

2. IHP recognizes that close communication via designated liaisons to the steering committee from IHP and SMP is critical if the steering committee is to represent the wishes of IHP (and the scientific community through the JOIDES panel structure). Thus, it is important that both IHP and SMP be represented on the "user groups" formed for input during the upgrade project. Development of the parameters, metadata requirements, value ranges, etc. of the prime data types (as reviewed and reconfirmed by IHP/SMP during their joint meeting in 1993) has been a lengthy, deliberate process with extensive input from the scientific community. SMP has already requested that SMP members be present in these user groups. IHP requests that IHP panel members also be present on these user groups. It further requests that the IHP and SMP liaisons be kept directly in the information and approval loop for the upgrade. In this manner the considerable effort toward determining prime data types, parameters, and requirements by IHP and SMP will be more accurately represented in the final database.

A list of IHP representatives for user groups in the various data categories follows:

Data Type	IHP representative
physical properties	Roy Wilkens
chemistry	Ellen Thomas (SMP representative)
sediments (incl. xrd)	Lynn Watney
geophysics	Mike Loughridge
paleontology	Bill Riedel
paleomagnetics	Will Sager

petrology (incl. xrf, thin sec)	Ian Gibson
downhole measurements	Debbie Barnes
structure	Joann Stock (TecP liaison to IHP)

IHP understands that the exact mechanisms for interaction between TAMU/Tracor and the steering committee will be discussed at the September meeting in Austin. IHP's suggestion for information flow is two-fold. The panel liaisons should be responsible for gathering necessary scientific input from the user groups and both IHP and SMP. The steering committee should synthesize the input for TAMU/Tracor. It is hoped that this will prevent diverse input bombarding TAMU and Tracor, will prevent information overload on John Coyne's group, and will ensure coordinated scientific guidance to TAMU and Tracor during the upgrade.

The panel liaisons and the steering committee will be better able to sort out differing opinions and balance them against historical precedent and advice of the panels. An input flow pattern might look like:

```
 User
group
input
  /\
 /  \
\/  \/
IHP/SMP liaison/steering comm. <--review/guidance-->TAMU/Tracor
```

3. IHP is concerned that completed data dictionaries may not accurately represent agreed-upon parameters. In TAMU's ISG report to the IHP in August, John Coyne notes that several of the proposed data dictionaries for prime data types are "complete" and that TAMU is proceeding with the review and completion of data dictionaries for the remaining prime data types. Despite considerable direct interaction between the IHP Paleontology and Stratigraphy Subcommittee and TAMU over the past two years on what parameters are required for a paleontology database, the structure of the paleontology database as forwarded to the IHP for review at the August meeting was missing several previously agreed-upon fields. The panel would like to ensure that these fields are reinstated in the final design for paleontology, and that similar omissions are not inadvertently finalized in other data types.

To ensure inclusion of correct fields, IHP requests that TAMU/ISG immediately email electronic copies of all existing proposed data dictionaries to the IHP liaison (Carla Moore) for review by IHP. As new data dictionaries are proposed by TAMU each should be immediately emailed as well. If this procedure is followed, review time will be minimized and the final database will be sure to contain elements previously agreed upon, as well as items which may be suggested by the new user groups. The panel liaisons will be able to gather and synthesize panel input for TAMU and Tracor quickly.

IHP hopes that this expression of confidence in the steering committee and willingness to work closely with the committee through the appointed liaison will streamline the upgrade project. IHP hopes these suggestions will help ODP more effectively achieve its goal of a new database and computing environment that will serve the needs of the scientific community.

cc John Coyne, TAMU
Joris Gieskes, Chair, SMP
Carla Moore, IHP liaison to ODP steering committee
Terri Hagelberg, SMP liaison to ODP steering committee

Patty Fryer

To: patty@mano.soest.hawaii.edu (Dr. Patricia Fryer)
From: jgieskes@ucsd.edu (Joris Gieskes 619-534-4257)
Subject: Re:List server
Cc:
Bcc:
X-Attachments:

APPENDIX IN

Dear Patty:

I include a note of Terri King-Hagelberg. I agree in principle. We will discuss this at our meeting. I guess future liaison will be important.

Cheers, Joris

>Hello Joris!
>
>I am trying to ungroup from the Steering Committee meeting and group for
>the SMP meeting. There is one item from the Steering Committee that needs
>immediate attention. Carla Moore of IHP has set up an email list server
>and mosaic page for IHP's use. THe main purpose will be to electronically
>coordinate the data dictionary and parameter definitions as soon as possible
>so that TRACOR can start their work. Carla will receive a prototype data
>dictionary from ODP, and distribute it over the listserver and then coordinate
>the responses and pass those back to JOI and TRACOR and ODP.. My task on
>the steering committee is to coordinate a similar effort with SMP. The
>most efficient and least redundant means to do this would be if IHP and SMP
>can use the same listserver - it would get everything out on the table
>faster, and hopefully lead to quicker resolution. In order to do this, you
>and Patty Fryer will need to agree as to our (IHP and SMP) sharing a common
>listserver? Ellen Thomas also agrees that it might be much more efficient.
>We would like to have this resolved before SMP so that work on the data
>dictionary can begin immediately following the meeting... IHP will already
>be at work we hope! If you and Patty agree, Carla and I will need to know
>so I can inform SMP and so Carla can add SMP to the list of people.
>
>I leave for Las Palmas THursday afternoon... see you there!
>
>Terri
>----------
>Terri King Hagelberg
>
>Graduate School of Oceanography
>University of Rhode Island
>Narragansett, RI 02882
>
>email: terrih@yaquina.gso.uri.edu
>phone: (401)-792-6662
>fax: (401)-792-6811

I agree in principle. I will send this message to Patty and I assume that this is indeed the best way to go. Of course, this needs discussion at the SMP meeting, but IHP is the main data handling panel, we are the data getting panel. Co-operation is a necessity. Cheers, Joris

Appendix IV

From: Peter_Clift@odp.tamu.edu (9/21/94)
To: kmbrown@ucsd.edu

GatorMail-Q structure thoughts
Received: by grdqmail.ucsd.edu (2.01/GatorMail-Q); 21 Sep 94 14:29:08 U
Received: from odp-sun3.tamu.edu by ucsd.edu; id OAA22633
sendmail 8.6.9/UCSD-2.2-sun via SMTP
Wed, 21 Sep 1994 14:21:58 -0700 for <kmbrown@ucsd.edu>
From: Peter_Clift@odp.tamu.edu
Received: from odp.tamu.edu by odp-sun3.tamu.edu (4.1/SMI-4.1)
id AA20156; Wed, 21 Sep 94 16:21:57 CDT
Received: from cc:Mail by odp.tamu.edu
id AA780189657; Wed, 21 Sep 94 16:22:15 CDT
Date: Wed, 21 Sep 94 16:22:15 CDT
Message-Id: <9408217801.AA780189657@odp.tamu.edu>
To: kmbrown@ucsd.edu
Return-Receipt-To: Peter_Clift@odp.tamu.edu
Subject: structure thoughts

Structural Data Collection

What Structural Geologists Want

The structural community wants the structural data collected on the ship to be accorded the same priority as other shipboard data, to be standardized and incorporated into the new database upgrade. They wish to retain some flexibility to avoid some of the short comings of routines like HARVI and to take into account unusual features in the core. They definitely need the ability to make detailed drawings of the core, which can be labeled and they want at least some of these sketches to be published within the IR volume or at least on the CD ROM. In due course the community would like to see an automated scanning process that would allow rapid scanning of core and labeling on a computer screen, with the data stored on the database. They also want computerized data tables of structural information which form an integral part of the ODP database.

What We Have

At present the review of structural data has consolidated the collection of different tables, sketches and diagrams used in the past into a standardized VCD form, solely for structural work, together with a generic structural data spreadsheet made using MS Excel. A series of structural identifiers has been named using the variety of structures seen in previous cores (both hard and soft rock) and a scale of relative intensity of deformation has been drawn up. These features form the foundations to the structural data description as it now stands. The use of these forms and the nature of the structural collection is discussed by the explanatory notes drafted recently. The procedure calls for the structural geologist to draw a detailed picture of the core using the VCD form.

Ball point pen is used to maximize the likelihood that the picture can be scanned and placed on the CD ROM, as there is insufficient staff at ODP to effectively redraft all the detailed diagrams that are produced by even a fairly modest leg, even if they could be sure not to lose essential detail marked by the scientists. Individual features are recorded on the data spreadsheet, typically on paper, which must then be transferred by the science party on to the computer if it is to be incorporated into the database. Again there is insufficient staff available at ODP to do this task after the cruise. The current system calls for the scientists to fill out the marked columns but leaves open the possibility of adding further columns if the science dictates

such. This system has been reviewed by most of the TECP at least once and some of the TECP several times. It was sailed on Leg 156 where it was modified in the light of experience.

What we need now

For the structural data to progress further it is important that SMP recognize the principle data sets that the community needs and classifies them as "prime data", i.e. data that it is the duty of science party to collect on a cruise and that they are obligated to record in a fashion that can lead to publication and integration with the database. In order for the structural data to progress towards a place in the database the collection of detailed core drawings and the storage of structural measurements in electronic form on the spreadsheet provided is a basic need. Further data may be collected at the discretion of the science party but certain basic essentials need to be spelt out and required. Further computerization and development of a simple core scanning system should remain a goal but this is not likely to occur in the near future due to the worklaod placed on the ODP system by the database upgrade.

What is Realistic

The needs of the structural community and the data that is collected does not easily slot into any of the existing computer programs operated onboard JOIDES Resolution. The existing barrel sheet programs are complex programs and are not easily altered to display the data required by the structural VCD. While HARVI does have an accompanying outline sketch of the core, the normal detail on this is far below that needed for the structural work. There is no separate column for structural identifiers, although this could be added without too much difficulty. There would however, be no room remaining for close-up sketches. In the case of VCD and its planned replacement "Etch-a-sketch" the problem is more serious as the product of these programs is the original ODP/DSDP barrel sheet, a low resolution graphic log with no representation of the core itself. However, this already includes a column for tectonic as well as sedimentary structures. Alteration of either of these sedimentary programs is impractical without completely revising the way sedimentary rocks are described and recorded, i.e. a revision of the barrel sheet as the way to describe sedimentary rocks. It appears that the structural VCD will have to remain as an essentially hand-drawn diagram produced on the ship until easy way to scan core or provide good on screen draughting can be made available. This is seen as a long term aim.

In the short term the realistic aims are to improve the shipboard production of hand-drawn VCDs to the best possible state to allow them to approach publication quality with minimal postcruise work. A standard Excel spreadsheet needs to be introduced, presumably the version tested over the last seven months. The use of these forms and VCDs needs to be declared mandatory so that a consistent data set of structural information can start to be collected and the publication of all structural data and selected VCDs can be achieved in the short term in the IR volume or CD ROM. Science parties need to be restrained from just altering the structural data forms and VCDs for personal aesthetic purposes as has been the case in the past, and the structural forms treated int he same way as sedimentary and hard rock VCDs and data programs. At least as important is that ODP must staff structural geologists to almost any cruise of structural significance if this data is to be collected at all.

OCEAN DRILLING PROGRAM

To Kevin Brown, Scripps Institution of Oceanography, La Jolla, California

Fax - (619) 534 2997

From Peter Clift, Ocean Drilling Program, Texas A&M University, College Station, Texas 77845, USA

Fax (409) 845-0876

Date - Monday 19th Sept 1994

Pages - 6 (including this page)

Dear Kevin,

I include here copies of the structural forms as they now stand. The set which we hope and indeed insist (!) that future structural parties use features a structural description form, on which the detailed sketch of the core is made using a ball point pen for maximum clarity and reproducability. Pencils are not permitted ! Individual structures on the sketch are labelled using a letter coded found on Table 1 and a number. Thus the first fault to be described is F1 etc etc. This identifier is then used to cross reference between the core drawing and the data table (Figure 2) on which all the basic information of the feature in question is recorded. I envisage this set as being the core set of readings. The science party should of course be free to make more readings and add columns as they see fit after first making the basic mandatory observations. I suspect that people will tend to fill in this form in paper at the core table , but this information must then transfered to computer for strorage in the database. This is essential. I envisage the drawing of core sketches and the completion of the data table as being elevated to the status of HARVI and VCD is terms of being the basic data that the staffed structural geologist must do to fulfill their obligation to ODP. Too much tinkering with the nature of these forms from one cruise to the next must be discouraged if we are ever to have a structural database, although as I said above this doesn't preclude the addition of extra data over and above what is asked for here. Where possible the forms also ask for an intensity factor for the strength of deformation to be recorded. This may be highly subjective but is considered very useful under certain circumstances and has been used to effect by some hard rock cruises.

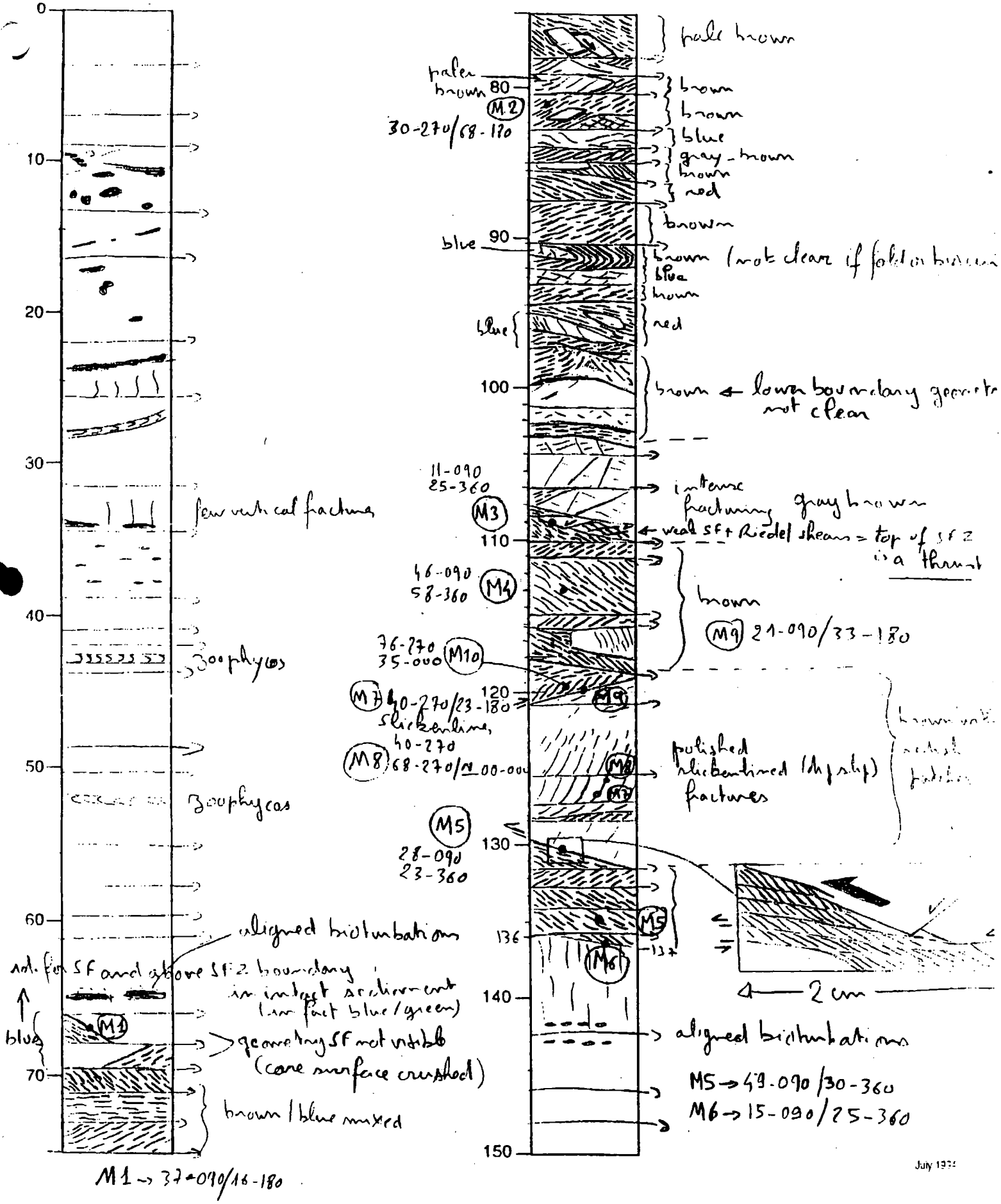
The forms as they stand have been subjected to several rounds of examination by certain members of TECP, by ODP staff scientists, by active members of the community and were tested in action on Leg 156. Further testing is envisaged on Leg 159-161. A plan to hold a 2-3 day workshop of active members of the community with the purpose of writing an ODP technical note has been discussed and is being planned for spring 1995. The existing explanatory notes (which Joris and Ellen Thomas have copies of) presently serve as the guide on how to do structural measurements on the ship. A key factor in being able to computerize and formalize the structural measurements is to get structural people to use the basic format worked out by this review process. The ad hoc making up of individual forms needs to stop. As I mentioned above however the freedom to make additional measurements where neccessary must be retained to avoid loss of valuable data.

Best wishes

Peter Clift

STRUCTURAL GEOLOGY DESCRIPTION

Leg 156 Hole 969B Core 13X Section 2 Observer CL.



July 1993

Leg Site Hole Core Observers

Section	Depth (cm)		Depth	Piece	Feature	Intensity	Depth of	Core Face Orientation		2nd appt. orientation		Core Reference Frame		Comments
	top	base	mbsf	#	#	if approp.	measurmnt	appt. dip	direction	dip angle	direction	strike/trend	dip/plunge	

Figure 2

Structural feature	Identifier abbreviation	Orientation recorded
Bedding	B	strike and dip of bedding surface
Color/texture variation	CTV	strike and dip of separating surface
Fissility	Fiss	strike and dip of parting surface
Joint	J	strike and dip of joint surface
Mineral vein	V	strike/dip of margin; plunge/trend of fibers
Magmatic vein	MV	strike and dip of vein margin
Sediment-filled vein	SV	strike and dip of vein margin
Fault	F	strike and dip of fault surface
Fault, normal	Fn	strike and dip of fault surface
Fault, reverse	Fr	strike and dip of fault surface
Fault, strike-slip	Fss	strike and dip of fault surface
Fault, oblique-slip	Fob	strike and dip of fault surface
Breccia zone	BZ	strike and dip of zone margin
Deformation band	DB	strike and dip of band margin
Stylolite	St	strike/dip of surface; plunge/trend of peaks
Stratal disruption	SD	strike and dip of boundaries
Scaly fabric	SF	strike and dip of foliation
Scaly fabric zone	SFZ	thickness of zone; strike and dip of zone margin
Spaced foliation	SpFol	strike and dip of foliation
Fold	FO	axial surface strike/dip; hinge line trend/plunge
Slickenline	Sl	plunge and trend of slickenline surface
Other linear structure	L	plunge and trend
Magmatic fabric	M	strike/dip or plunge/trend
Mineral shape fabric	MSF	strike/dip or plunge/trend
Ductile shear zone	DSZ	strike and dip of zone margin
Magmatic contacts	MC	strike and dip of contact surface
Other planar structure	P	strike and dip

Table 1

Intensity Factors

Category	0	1	2	3	4	5
Fractures	Unfractured	Minor fracturing	Minor observable displacement, i.e., a fault	Strong Faulting		
Folds	No folding	Gentle folding	Moderate folding	Strong Folding	Intense Folding	
Veins	No Veins	Weak veining	Moderate veining	Strong Veining	Intense Veining	
Ductile fabric	Fabric absent	Weakly Foliated	Strongly foliated	Porphyroclastic	Mylonite	Ultramylonite
Brittle fabric	Unsheared	Dense anastomosing fracturing and incipient brecciation	Fault brecciation. rotated clasts	Protocataclasite, Rotated, and translated grains showing size reduction	Cataclastite	Ultracataclasite
Magmatic fabric	Isotropic	Weak Shape Fabric	Moderate Shape Fabric	Strong Shape Fabric		

Table 2

APPENDIX V

INTEROFFICE MEMORANDUM

July 14, 1994
MAS/M07/180

To: Tim Francis

Via: Barry Harding

From: Mike Storms/Bill Rhinehart

CC: Ron Grout
Tom Pettigrew
Dan Reudelhuber
Jim Briggs
Roland Lawrence
Bob Olivas
Jamie Allen
Jack Baldauf
Peter Blum
Russ Merrill
John Coyne
Rick McPherson

Subject: Status of Rig Instrumentation Project

Summary

Engineering and Drilling Operations has been actively investigating an upgraded Rig Instrumentation System (RIS) for the past few months. Such a system will add the following capabilities:

Scientific Provide real-time, or near real-time (1-2 hour delayed), depth, rate of penetration (ROP), weight on bit (WOB), drilling fluid flow rates, and heave data for inclusion in scientific analysis. Depth and ROP have been identified as particularly important to Shipboard Data Integration (SDI) projects, such as Hard Rock Orientation (HRO).

Operational Provide the driller and rig operations personnel with an accurate, real-time measure of depth and ROP. Depth is presently estimated by an inaccurate visual interpretation. ROP is done likewise making it difficult to react to rapidly changing drilling conditions.

Operational Organize and present pertinent drilling/coring data to assist both the driller and the ODP/TAMU Operations Superintendent in making well-informed decisions.

Operational Provide ODP/TAMU Operations with accurate and complete historical drilling data to aid in drilling/coring method evaluation, drilling equipment comparisons, and leg planning for revisiting sites or similar lithologies.

Due to inherent problems with the original RIS and the advancements made in data acquisition in the past five years, we feel that it is best to upgrade to a new RIS rather than attempt to fix the old one. We have investigated new RIS alternatives from commercial products to in-house developed programs. Primarily due to our already limited engineering manpower, we feel the best option is to buy a commercial RIS product from an experienced vendor. This will provide ODP with a proven system that can be installed and placed on-line with the least amount of in-house effort.

There is one major hurdle with this approach. Commercial systems do not provide depth and ROP for a "riserless" operation such as ours. This means depth and ROP data would not be available unless "ground" reference data (ship's motion in our case) is provided. We feel that with the open architecture of the more advanced RIS' now available, and with assistance from an outside vendor, we will be able to add depth and ROP to the system we choose. We plan on having a feasibility analysis done on incorporating depth and ROP prior to committing to an RIS purchase.

The complete system with added depth and ROP capability will be expensive. We are estimating $200K for the initial installation. These systems also require significant upkeep, (usually in the form of an additional electrical technician to keep them working properly). That could add as much as $100K per year in maintenance/calibration costs (two electronic technicians/one each sailing on alternate legs). These are estimates and may be slightly off, but the order of magnitude is correct. These figures do not include in-house engineering support, which of course will be needed on occasion. The maintenance labor cost could be reduced if a cost sharing arrangement is negotiated with SEDCO.

For such a major commitment, we feel it is imperative that this topic be brought back before the science community to answer the following questions:

1) Is the science community willing to make a major, long-term commitment to RIS as part of Shipboard Data Integration (SDI)? It is not just the initial expenditure that has to be considered. The time and money for routine upkeep, maintenance, and future improvements is equally important. Without the latter, the upgraded RIS would soon end up with the same fate as the present system, either unused or with poor quality and reliability.

2) Once the level of interest and commitment is determined, we need to confirm the critical operational parameters needed by the Science community (See attached Appendix 1). All of the RIS data listed would be useful to ODP Operations as indicated above, but if the science community only desires depth and ROP, than the entire project should be reconsidered. The level of long term maintenance support does not change appreciably with the RIS reduced in scope. Therefore, unless there is strong scientific commitment to a complete system, we should reevaluate whether ODP/TAMU engineering/operations resources, both time and money, should be expended in this area.

We are preparing an RFQ for both the RIS and for the depth/ROP feasibility analysis.

We will wait for a positive indication from the science community before we commit to the full system development. Prompt response from the science community to our query could mean a purchase this fiscal year with installation of the basic system in early to mid 1995 (See Development Plan attached). A fully functional RIS with integrated depth/ROP capability is projected to be on-line by the end of FY95 (See attached RIS Development Plan).

Background

ODP purchased and installed a drilling Rig Instrumentation System (RIS), or drilling recorder, in 1987-88. That was an off-the-shelf package, which met the majority of ODP's needs. What this package could not do in its original state was record depth and ROP, a critical function. While the system could easily do this for a floating drilling vessel used in industry, our situation was unique in that the JOIDES Resolution operates without a drilling riser. Standard RIS packages need the riser to use as a "ground" reference. That is typically accomplished by instrumenting the displacement at the top of the riser.

To record depth and ROP, the original vendor modified their system to monitor the ship's vertical position with respect to time and attempted to use that as the reference signal. This resulted in non-standard, developmental hardware/software of some complexity and requiring a great deal of effort to implement. In addition, standard data acquisition channel integrity was compromised leading to failures and low reliability in these areas as well. Despite their good intentions, the vendor was not capable of supporting a customized system. The combination of having a developmental system, limited access to the ship and the system due to the sailing schedule, and the reassignment of our resources to other, higher priority, projects resulted in a RIS that never did provide depth and ROP.

The system was not accepted and did not get the continued attention, support, and maintenance critical to its success. This was not a failure on any one person's or entity's part, but a failure to get adequate long-term commitment (money, manpower, and time) for a complex, demanding project.

In April 1992, PCOM placed Core-Log Integration projects (now referred to as Shipboard Data Integration) as number two on the ODP Development Engineering list of priorities. Along with the obvious operational benefits of a RIS, such a system is also critical for full implementation of SDI. We reopened the project, but due to a resource conflict with the number one project, DCS, not much new ground was covered until just recently.

Because of several remaining problems with the original RIS, and advancements made in data acquisition in the past five years, we are investigating the development and installation of a new RIS. We have identified two options for consideration. The first option is the purchase of an off-the-shelf system. The second option is to acquire a fully customized system developed under ODP guidance by a competent vendor. The first

option offers a savings on the front-end in developmental time and on the back-end in support, but at a higher initial price. The custom package would likely be slightly cheaper in initial price, but would require significant ODP/TAMU engineering resources and take much longer to get up and running.

For either option, the depth and ROP question would be pursued as an independent project with the eventual goal of a dedicated "black-box" that would provide the main RIS with the appropriate ground reference signal for depth/ROP calculations. That approach may appear to be the same as the original one a few years ago, but it is vastly different. If an off-the-shelf package is chosen, the commercial vendor will not be asked to "customize" it for ODP and then be expected to support it in the future. The depth project will be focused on providing the missing channel of information to the commercial system for the proper depth and ROP. If a custom RIS package is pursued, it is doubtful that the same vendor would have the expertise in both the RIS and the depth/ROP problem. The RIS vendor would be responsible for their part and we would have to contract the depth project to a third party.

At this time, we favor buying a commercial system and handling depth/ROP as a separate project to provide the missing information. That allows us to conserve engineering resources and hopefully avoid at least some "developmental" pitfalls by using a field proven commercial package as the nucleus of the system. The availability of long-term vendor support with standard commercial packages is also relevant. We are currently evaluating several RIS packages and are planning to release an RFQ soon. A feasibility study of the depth/ROP problem will also soon be awarded to a vendor with the appropriate expertise. Once depth/ROP feasibility has been established we could proceed with the purchase of the RIS. The basic RIS could potentially be installed in early to mid 1995. We will likely choose to install the basic system first, without depth/ROP capability, then incorporate these features later.

It will cost an estimated $200k for a RIS with added depth/ROP capability. This is broken down as follows;

RIS hardware and software	$ 100
Depth/ROP Feasibility/Design	60
Sensors, Supplies, Installation	40

	$ 200

While this is only a rough estimate, the order of magnitude should be close.

Another decision to be made before a system is purchased is the maintenance responsibility for the electro-mechanical components of such a system. Typically, such systems are sold or leased with a maintenance contract, which actually means a full-time technician to keep the system calibrated and running. While the ODP system will have less components then a normal oilfield rig package, it will still require support on a leg to leg basis. This will be especially true if ODP is to have confidence in data integrity.

The cost to add an electrical technician to each leg is estimated at approximately $100K per year assuming ODP/TAMU assumes the entire burden. Whether this should be a SEDCO or ODP position will have to be determined. As always, in-house engineering time will occasionally be required to support the system as problems arise or improvements are suggested.

For such a major commitment of money and time, we feel the purpose of the proposed RIS needs further refinement. The data to be collected needs to be further defined. Not just what data is collected, but also how often it is measured and how it should be stored/accessed needs to be decided. ODP has put together a list of data to be collected (See Appendix 1). This list should be sanctioned by the science community now, before the money is spent and the system installed. Once that is done, the minor details can be resolved through cooperation between ODP Engineering/Drilling Operations and other appropriate departments.

The following drilling parameters will be recorded as 1-minute averages versus GMT. They will reside in a database made available in real-time or near real-time to the science party onboard the JOIDES Resolution and, once ashore, to the entire community.

Bit Position, mbrf or mbsf
Hole Depth, mbsf
ROP, m/hr
Derrick Load, lbs
String Load, lbs
WOB, lbs
Top Drive RPM
Top Drive Torque, ft-lbs and/or amps
Pump Strokes 1 (Flow Rate), spm and gpm
Pump Strokes 2 (Flow Rate), spm and gpm
Pump Pressure 1, psi
Pump Pressure 2, psi
Core Start/Stop, time
Mud Sweep Start, time
Accumulated Strokes, counter
Hours on Bit
Sandline Weight, lbs
Sandline Depth, mbrf or mbsf
Coax Depth, mbrf or mbsf
Fastline Ton-Miles
Sandline Ton-Miles
Ship Heave, m
Ship Roll, degrees
Ship Pitch, degrees

The following Dynamic Positioning data could also be made available as 1-minute readings, although most likely in a separate database;

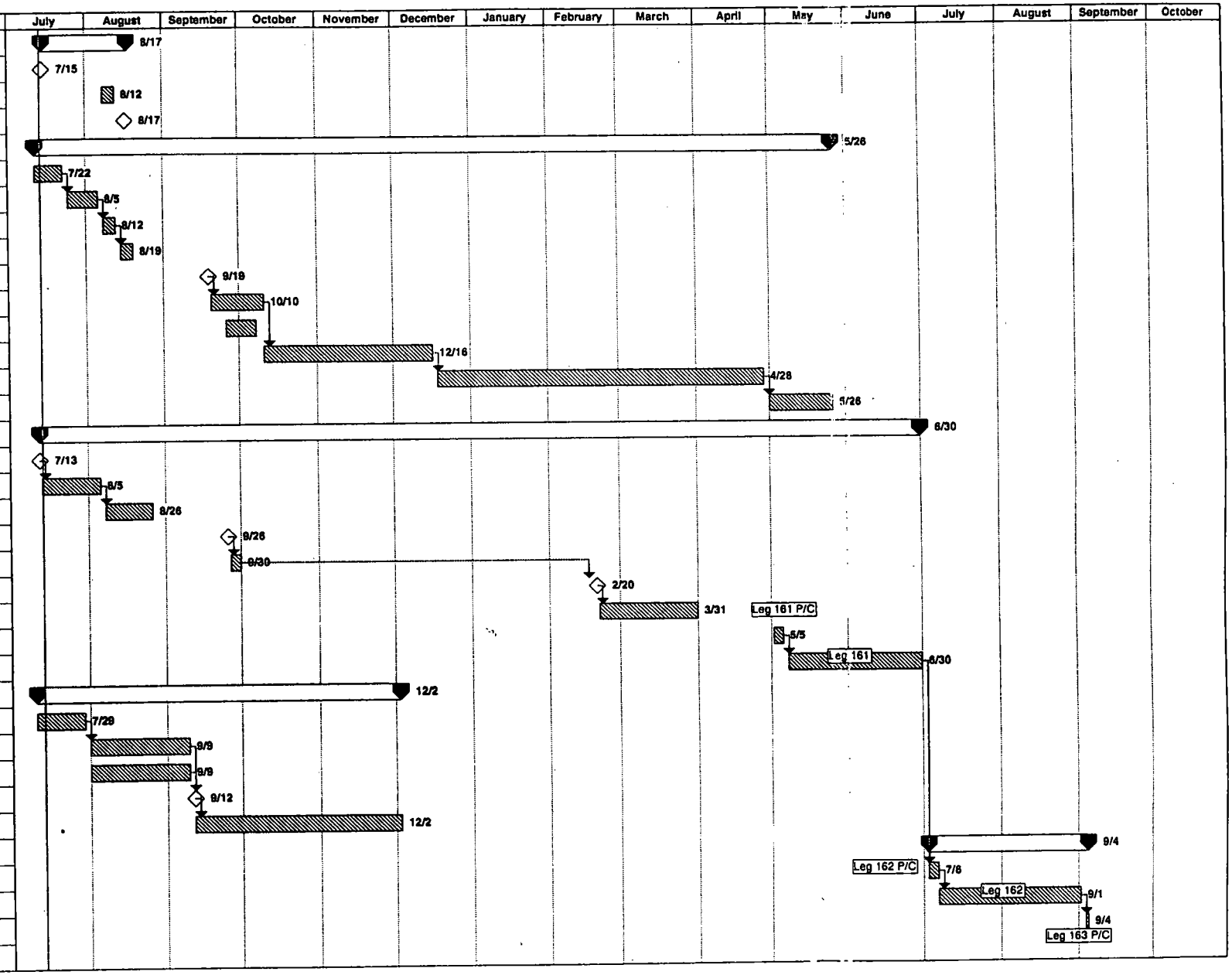
Heading
Wind Speed, knots
Wind Direction
X/Y Offsets fm Primary Seafloor Positioning Beacon, m
X/Y Offsets fm VIT/TV Frame Mounted Beacon, m

NOTE: **Boldface Items - data with desirable scientific use indicated to date**

Rig Instrumentation System (RIS) Development Plan

7/14/94

ID	Task Name
1	Project Definition
2	Status Memo to TimF
3	PCOM Meeting in Iceland
4	PCOM direction to ODP/TAMU
5	Developmental Depth/ROP
6	Draft of S of W for Depth/ROP Analysis
7	Response Mtg with vendor
8	Final S of W to Admin
9	Sole Source Award by
10	Depth/ROP Feasibility Report due
11	Prepare S of W for Depth/ROP system
12	Locate Bidders
13	Bid/Negotiate/Award Contract
14	Design and Develop Depth/ROP
15	Test System
17	Basic RIS
18	Letter of Intent out
19	Draft RFQ for Basic RIS to Admin
20	Bid Package out
21	Responses due back to ODP/TAMU
22	Evaluate & Award Basic RIS
23	Take Delivery of Basic System
24	Training/Shore Testing
25	Installation aboard ship
26	Sea Trials
27	Long-Term Maintenance Plan
28	List of Projected Sensors/PM Schedule
29	SEDCO Negotiations
30	ODP Internal Negotiations
31	Agreement in Principal
32	Amend Contract/Budget
33	Integrated RIS/Depth/ROP
34	Integrate the two systems onboard
35	Test Integrated System
36	Integrated System Training



F:\USERS\BILLR\RIS_SDI\PLAN1.MPP

APPENDIX VI

TECHNOTE #	TITLE	DATE
1	Time Estimates for Coring Operations	December, 1984
3	Shipboard Scientist's Handbook	Revised 1990
6	Organic Geochemistry Aboard JOIDES Resolution - An Assay	May, 1986
7	Shipboard Organic Geochemistry on JOIDES Resolution	October, 1986
8	Handbook for Shipboard Sedimentologists	February, 1988
9	Deep Sea Drilling Project Data File Documents	January, 1988
10	A Guide to ODP Tools for Downhole Measurements	Revised 1993
11	Introduction to the Ocean Drilling Program	1990
12	Handbook for Shipboard Paleontologists	1989
13	Acronyms and Abbreviations Used in the Ocean Drilling Program	1993
14	A Guide to Formation Testing Using ODP Drillstring Packers	1990
15	Chemical Methods for Interstitial Water Analysis Aboard JOIDES Resolution	1991
17	The Design and Preparation of a Wireline Pressure Core Sampler (PCS)	1992
18	Handbook for Shipboard Paleomagnetists	1993

TECHNOTE #	TITLE	DATE
19	Revised Hydrogen Sulfide Drilling Contingency Plan	1993
20	Science Prospectus FY 94	1993
	Science Prospectus FY 95	1994
21	Design and Operation of a Drill-In-Casing System (DIC)	1993
22	Safety Procedures on Board the SEDCO/BP-471 (JOIDES Resolution)	1993

Name	Volumes	Copies	Shipboard Loc.	Shorebased Loc.	Date of Manual
Hewlett Packard 1000 RTE-A	10	1 of 1-9; 2 of 10		B113 Science Lab	
Vol. 1: Index and Glossary, Primary Installation, Getting Started					January, 1989
Vol. 2: EDIT/1000 User's Manual					January, 1989
Vol. 3: Utilities Manual					January, 1989
Vol. 4: Macro/1000 Reference, Data Entry Point					July, 1990
Vol. 5: Programmer's Reference, Link User's Manual					August, 1987
Vol. 6: Relocatable Library Reference					January, 1989
Vol. 7: System Generation and Installation, Driver Designer's Manual					July, 1990
Vol. 8: System Design Manual, Driver Reference, HP-IB User's Manual					August, 1987
Vol. 9: Computer Support Catalog, INTEREX Brochure					5/90 with 7/90 update
Vol. 10: Quick Reference Guide					2/88 and 10/90
HP-1000 Mail/1000	1	1		B113 Science Lab	July, 1990
HP-1000 Log Support	1	1		B113 Science Lab	March, 1984
Hewlett Packard A-Series Computer Systems CE-Handbook	1	1		B113 Science Lab	January, 1987
Delsi Rock-Eval Operation Manual and Troubleshooting Guide	1	2		B113 Science Lab	No Date
New Version Rock-Eval Operations Manual	1	1		B113 Science Lab	No Date
Dionex AI-450 Autosampler Editor User's Guide	1	1		B113 Science Lab	May, 1992
Dionex AI-450 Chromatography Software User's Guide	1	1		B113 Science Lab	September, 1992
Dionex DX-100 Chromatograph with SRS Control Operator's Manual	1	1		B113 Science Lab	May, 1992
Dionex 2120i Ion Chromatograph (IC) Operation Manual	1	1		B121	No Date

Name	Volumes	Copies	Shipboard Loc.	Shorebased Loc.	Date of Manual
Dionex Ion Chromatography Training Course Manual	1	3		B121	August, 1983
Dionex DX100 Ion Chromatograph Manual Leg 148 Version	1	2		B113 Science Lab	February, 1993
Dionex Anion Fiber Suppressor-1 Instructions	1	1		B121	1983
Chem Tech User's Guide: Lab Automation System	1	1		B113 Science Lab	No Date
Nitrogen Analyzer NA-1500 Instruction Manual	1	1		B113 Science Lab	No Date
Model 8200/8400 Hydrogen Generator Operation Manual	1	1		B113 Science Lab	1990
Booker Natural Gas Analyzer Manual Leg 120 Version	1	1		B113 Science Lab	March, 1988
Introduction to Shipboard Organic Geochemistry Leg 153 Version	1	1		B113 Science Lab	December, 1993
Chem Lab Notes March 1994 Version	1	2		B113 Science Lab	March, 1994
Carlo Erba Instruments Eager 200 Instruction Manual	1	1		B113 Science Lab	January, 1990
Varian 3000 Series GC's Assembly Drawings and Parts List, Printed	1	1		B113 Science Lab	1989
Circuit Boards and Schematics Vol 3/4 Documentation					
Varian 3300/3400 Gas Chromatography Operator's Manual Vol. 1	1	1		B113 Science Lab	1990
Varian Aerograph Model 9225 Hydrogen Generator Operating and	1	1		B113 Science Lab	November, 1973
Maintenance Manual					
Varian Mark VI Burner Operation Manual	1	2		B121	January, 1989
Varian SpectrAA-20 Atomic Absorption Sectrophotometer Brief	1	3		B121	No Date
Introduction and Cookbook					
Spectra AA Spectrometer Cookbook Blue Book Handwritten Notes	1	1		B113 Science Lab	Notes from Legs 141-152

Name	Volumes	Copies	Shipboard Loc.	Shorebased Loc.	Date of Manual
Spectra AA-10 and Spectra AA-20, PSC-56 Programmable Sample	1	1		B113 Science Lab	February, 1986
Changer, GTA-96 Graphite Tube Atonomizer Operation Manual					
Hach Carle Series 100 and 400 Analytic Gas Chromatographs	1	1		B113 Science Lab	1983
Coulometer Operations Manual	1	1		B113 Science Lab	No Date
Barnstead ROpure ST Reverse Osmosis and Storage Tank System	1	1		B113 Science Lab	June, 1992
Operations Manual and Parts List Series 631					
HP5890A Gas Chromatograph Reference Manual	2	1 of 1, 2 of 2		B113 Science Lab	1983
HP5890 Series II Gas Chromatograph Operating Manual, Cool	1	1		B113 Science Lab	June, 1992
On-column Inlet Manual					
HP5890 Series II Gas Chromatograph Reference Manual, Site Prep/	1	1		B113 Science Lab	June, 1992
Installation Manual, Tutorial					
HP3365 Series II Chemstation DOS Series Reference Manual	2	1		B113 Science Lab	July, 1992
HP3365 Series II Operation Package: Getting Started, Running	1	2		B113 Science Lab	July, 1992
a Method, Running a Sequence					
Marine Technician's/Shipboard Scientist's Manual Technical Note 3	1	2		B113 Science Lab	1/87 and 7/87
Design and Operation of a Wireline Pressure Core Sampler (PCS)	1	1		B113 Science Lab	1992
Technical Note 17					
Revised Hydrogen Sulfide Drilling Contingency Plan Technical 19	1	1		B113 Science Lab	1993
Introduction to the Ocean Drilling Program Technical Note 11	1	1		B113 Science Lab	1990

Name	Volumes	Copies	Shipboard Loc.	Shorebased Loc.	Date of Manual
Chemical Methods for Interstitial Water Analysis Aboard	1	3		1 in B113, 2 in B121	1991
JOIDES Resolution Technical Note 15					
Chemical Technician's Ready Reference Handbook	1	1		B113 Science Lab	No Date
Shipboard Equipment Inventory	1	1		B113 Science Lab	July, 1992
User's Guide to JOIDES Resolution Computer System	1	1		B113 Science Lab	November, 1991
Sample Distribution Policy	1	1		B113 Science Lab	January, 1989
Shipboard Organic Geochemistry on JOIDES Resolution	1	1		B113 Science Lab	October, 1986
Technical Note 7					
Coulometer Procedure	1	1		B113 Science Lab	No Date
Brief Glossary of Scientific Terms	1	1		B113 Science Lab	No Date
Review of Basic Chemistry	1	1		B113 Science Lab	No Date
HP5890 Maintenance Student Manual Course No. 41001A	2	1		B113 Science Lab	January, 1994
Techniques of Chromatography Student Manual Course No. H4002A	1	2		B113 Science Lab	January, 1994
Microsoft Excel User's Guide, Function Reference, Quick Reference	1	1		B113 Science Lab	1992
Microsoft Word User's Guide	1	1		B113 Science Lab	1991-1992
Microsoft Word: Getting Started	1	1		B113 Science Lab	1991
Claris Filemaker Pro Getting Started	1	1		B113 Science Lab	1992
Claris MacDraw II User's Guide	1	1		B113 Science Lab	1988
Cricket Reference Manual	1	1		B113 Science Lab	1988
Cricket User's Guide	1	1		B113 Science Lab	1988

Name	Volumes	Copies	Shipboard Loc.	Shorebased Loc.	Date of Manual
Macintosh System Software User's Guide Version 6.0	1	1		B113 Science Lab	1988
Minitab Reference Manual Release 7	1	1		B113 Science Lab	April, 1989
Lotus 1-2-3 Tutorial Release 3.1	1	1		B113 Science Lab	1990
Chem Lab Notes	1	1		B121	No Date
SAS/DPS System Reference Guide Version 3.5	1	4		B121	March, 1983
SAS/DPS Graphics Reference Guide	1	2		B121	March, 1983
ARL Instrument Documentation	1	1		B121	1983
ARL Quantometer 8400 XRF User's Manual	1	1		B121	August, 1983
ARL XRF-11 Reference Guide	1	1		B121	October, 1984
ARL MainDec's Test Program User's Manual	1	1		B121	July, 1981
ARL ICS User's Guide 8400 XRF Instruments	1	1		B121	September, 1984
ARL QA Report	1	1		B121	January, 1985
ARL Technical Description 8400/8600	1	1		B121	September, 1984
ARL Standard Application Report: The Analysis of Oil with the	1	1		B121	No Date
Applied Research Laboratories 8400 Series of X-ray Fluorescence					
Spectrometers					
ARL 8400/8600 Series Customer Training School	1	1		B121	September, 1987
ARL X-Ray Wavelength Tables	1	1		B121	No Date
RT-11 Version 5 Software Installation Manual	1	1		B121	No Date

Name	Volumes	Copies	Shipboard Loc.	Shorebased Loc.	Date of Manual
Philips Worked Examples and Help Files for APD3720 Software	1	1		B121	February, 1985
Version 2					
Philips APD3720 Software Instruction Manual Chapters 1-7,10	1	2		B121	February, 1985
Philips Diffraction Control Unit PW1710/00 Operation Manual	1	1		B121	No Date
Digital Equipment Corporation Basic Reference Manual	1	1		B121	February, 1984
Fortran-77 Pro/Tool Kit	1	1		B121	September, 1983
3350A System Manager Seminar	1	1		B121	No Date
Current Meter System Operation and Maintenance Manual	1	1		B121	December, 1986
Extendable Boom Model 554 Operations Manual	1	1		B121	October, 1984
Define-Process Seismic Processing System User's Guide	1	1		B121	No Date
Cross-Line Electro-Active Levelwind Models #EALW-20040 and	1	1		B121	No Date
#EALW-10022 Installation and Setup Procedures					
Cross-Line Electro-Hydraulic Winch Retriever Models 10010-S	1	1		B121	No Date
and 20010-40					
ODP Wirelogging Manual	2	2		B121	January, 1990
System 1032 User's Manual Version 6.0	1	1		B121	September, 1986
Flame Atomic Absorption Training Course Manual	1	1		B121	1983
Perkin Elmer CHN Elemental Analyzer Technician's Cookbook	1	1		B121	No Date
Chroma-Skills Principles of Gas Chromatography Short Course	1	1		B121	June, 1991
Chroma-Skills Operator Trouble Shooting for the Gas Chromatograph	1	1		B121	June, 1991

Name	Volumes	Copies	Shipboard Loc.	Shorebased Loc.	Date of Manual
User's Guide to ODP Microcomputers	1	1		A150	No Date
Lab-Tech 100 Particle Size Analyzer Operations Manual	1	2	Core Description Lab	A150	No Date
VCD User's Guide and Instructions for Barrel Sheets	1	1	Core Description Lab	A150	No Date
VCD Release Notes: Version 1.0.1 B12 and Version 1.0.1 B14	1	1	Core Description Lab	A150	B12: 3/92, B14: 9/92
HARVI and HRTHIN System User's Guides and Quick Guides	1	1	Core Description Lab	A150	October, 1992
FINDCOMP User's Guide V117	1	1	Core Description Lab	A150	No Date
Slides V127 User's Guide	1	1	Core Description Lab	A150	May, 1989
Kappabridge KLY-2 Magnetic Susceptibility Bridge Instruction Manual	1	2	Paleomag Lab	A150	No Date
Superconducting Rock Magnetometer Manual	1	2	Paleomag Lab	A150	2/90 and 7/93
Hall Probe Operating Manual	1	1	Paleomag Lab	A150	No Date
APS520 3 Axis Fluxgate Magnetometer System User's Guide and	1	1	Paleomag Lab	A150	March, 1988
Technical Reference					
Omega Thermocouple Operation Manual	1	1	Paleomag Lab	A150	1990
GSD-1 Specimen Demagnetizer and KEPCO BOP-72-5 Bipolar	1	1	Paleomag Lab	A150	January, 1983
Operational Power Supply Instruction Manuals					
Partial Anhysteretic Remanent Magnetizer Version 2.0 Preliminary	1	1	Paleomag Lab	A150	March, 1990
Operations Manual					
TSD-1 Thermal Specimen Demagnetizer Operation Manual	1	1	Paleomag Lab	A150	September, 1986
ASC Model IM-10 Impulse Magnetizer Operating Instructions	1	1	Paleomag Lab	A150	No Date

Name	Volumes	Copies	Shipboard Loc.	Shorebased Loc.	Date of Manual
MINISPIN (MOLSPIN) Spinner Fluxgate Magnetometer Operator's Manual	1	1	Paleomag Lab	A150	No Date
Tensor Orientation Tool Quick Operating Instructions	1	1	Paleomag Lab	A150	November, 1991
2G600 Automatic Sample Degaussing System User's Manual and Technical Reference	1	1	Paleomag Lab	A150	June, 1988
Crest Audio Model 8001 Professional Power Amplifier Owner's Manual	1	1	Paleomag Lab	A150	No Date
Misc. Cryo Documents	1	1	Paleomag Lab	A150	No Date
DM-2220 Digital Magnetometer Operating Instructions	1	1	Paleomag Lab	A150	October, 1980
B&K-Precision Model1601 Solid State Regulated DC Power Supply Instruction Manual	1	1	Paleomag Lab	A150	No Date
B&K-Precision Model 1466A-Single Trace and Model 1476A-Dual Trace 10 MHz Oscilloscope Instruction Manual	1	1	Paleomag Lab	A150	No Date
Variac 1010 Transformer Installation and Operating Instructions	1	1	Paleomag Lab	A150	No Date
Compumotor Model 2100 Indexer Operation Manual	1	1	Paleomag Lab	A150	1981
Skan-A-Matic Subminiature LED Thrubeam Pair L34/P34 Series Operation Manual	1	1	Paleomag Lab	A150	April, 1978
Cryo-Torr(R) 8 High-Vacuum Pump Installation, Operation, and Servicing Instructions	1	1	Paleomag Lab	A150	July, 1984
Zeiss Microscopy from the Very Beginning	1	1	Microscope Lab	A150	No Date
Zeiss Handbook of Incident Light Microscopy	1	1	Microscope Lab	A150	No Date

Name	Volumes	Copies	Shipboard Loc.	Shorebased Loc.	Date of Manual
Zeiss Worthwhile Information About the Function of your Microscope	1	1	Microscope Lab	A150	1984
Zeiss Function, Use, and Maintenance of Routine Microscopes	1	1	Microscope Lab	A150	1986
Basic Transmitted Light Microscopy by Butch Moomaw	1	1	Microscope Lab	A150	No Date
Sony DXC-1850MD Color Video Camera Operating Instructions	1	1	Microscope Lab	A150	1984
Analyx Systems Seismic Acquisition Analog to Digital Converter	1	2	Underway Lab	A150	September, 1992
Installation/Setup and Software Manual					
Index Properties ODP Shipboard Laboratory Manual Version 155	1	1	Physical Properties Lab	A150	March, 1994
XRF 386 Version 3.2-1 User Manual	1	1	X-Ray Lab	A150	November, 1992
Software for Automatic Powder Diffraction PC-APD Operation Manual	1	1	X-Ray Lab	A150	November, 1990
Total Access Diffraction Database (TADD) User's Guide	1	1	X-Ray Lab	A150	August, 1992

APPENDIX VII

Some comments on areas for future development of Fossilist

by Ellen Thomas

In the following are a few areas that should be considered in the further development of Fossilist by the software developers:

1. The internal structure and programming code of Fossilist needs major revisions to bring it into standard relational format (opinion from Pat Divert and Dave Lazarus at the September IHP meeting; both have extensive experience in dealing with relational database structures). A draft version of the suggested structure has been included in the IHP minutes; IHP suggests that the interface shell is left, while the overall program structure is essentially redone. This will be needed anyway to ensure future expandability and performance. Substantial structural modifications will be needed in any case to incorporate all data types requested by IHP and SMP (see below).

2. Many of the prime data as defined by IHP and SMP to be included in the ODP database are lacking in Fossilist. The definitions of prime data were based on the DSDP data fields, some of which can not be recognized in the present program. The program asks only for genus and species name; no subgenus, subspecies, open nomenclature, author, year, taxonomic concept. These fields are lacking for taxa as well as for zones. The 9-character taxonomic code used throughout DSDP, by NGDC, and in the ETH database group seems to be missing. The missing data fields are those that in many cases will not be filled in onboard ship; Fossilist, however, is the input into the data base, so that there is presently no way in which this information (available in the Scientific Results Volumes) can be placed into the database.

3. The lists of names for each of the fossil groups (data dictionary) is VERY long (thousands of names) and is so cumbersome to use that users refuse to do so. It would be much more useful if subsets of the dictionary could be selected by the user (as was requested by SMP in the past). Subsets shouldbe available according to geological age (coarse, choice of Middle Miocene through Recent; early Neogene, Paleogene; Cretaceous and older); by geographical area (high, middle, low lattitudes); and for benthics by depth (neritic, bathyal, abyssal).

4. Files must be exported from Fossilist to Excel to make range charts (the most important activity onboard ship); modifications can not be imported back into Excel. It would be much preferable if this were possible (again, as specified by SMP in the past). We understand that there are possible problems with importing names that may not exist in the DSDP/ODP dictionary of fossil names, but are convinced that these can be accomodated.

5. The present interface is too inflexible; switching between data entry mode and taxonomic list editing mode requires the user to go through too many screens.

6. There is no information on the handlking of data integrety once the program travels off the ship with the individual investigators, who then revise and add to the data. In the present form it will be possible that samples from different investigators will have identical sample ID's.

7. There are numerous larger and smaller quirks, such as the present position of the "depth" choice on the very first screen, while this parameter is used only by benthic specialists (a very small minority). More serious ones involve data loss or lack of data storage if new species names are inserted.