Minutes of the 34^{rd} Meeting of the PRC

DESY 21^{st} - 22^{nd} February 1994

PRC members present:

F.Barreiro (Madrid), W.Buchmüller (DESY), R.Felst (DESY), L.Foá (CERN), R.-D.Heuer (CERN), W.Hofmann (MPI-Heidelberg), J.Jaros (SLAC), A.D.Martin (Durham), J.May (DESY), J.Rander (SACLAY), D.H.Saxon (Glasgow), R.Sosnowski (Warsaw), P.Söding (DESY-IfH Zeuthen), G.-A.Voss (DESY), A.Wagner (DESY), B.H.Wiik (DESY,chairman), C.Youngman (DESY,secretary)

Non PRC members present:

HERA - F. Willeke (DESY). [21^{st}]
HERA-B - W.Schmidt-Parzefall (DESY). [21^{st}]
HERMES - E.Steffens (MPI-Heidelberg), K.Rith (Erlangen), M. Vetterli (TRIUMF), M.Dueren (DESY), K.Zapfe (DESY). [21^{st}]
ZEUS - B.Löhr (DESY), R.Klanner (DESY), S.Schlenstedt (DESY-IfH Zeuthen), H.Tiecke (NIKHEF), J.Whitmore (Pennsylvania), G.Wolf (DESY). [22^{nd}]
H1 - J.Bürger (DESY), F.Brasse (DESY), J.Feltesse (Saclay), R.Gerhards (DESY), U.Görlach (DESY). [22^{nd}]

The PRC received the following documents:

PRC 94/01
Proposal for a Presampler for the Forward and Rear Uranium-Scintillator Calorimeter in ZEUS.

Open session. Feb. 21^{st}, 10:30, Main Auditorium

Status report on HERA-B W. Schmidt-Parzefall, DESY.

Status report on ZEUS. H. Tiecke, NIKHEF.

Status report on H1. R. Gerhards, DESY.

Status report on HERMES. M. Vetterli, TRIUMF.

Closed sessions: Feb. 21^{st} - 22^{nd}, 14:00-17:30 and 9:00-12:30, Sem. Rm. 1

1. Approval of the minutes and matters arising from the last meeting.
2. HERA status report 93/94.
3. Status of HERA-B.
4. Status of HERMES.
5. Status of H1.
6. Status of ZEUS.
7. Miscellaneous.
8. Future PRC schedule and summary of recommendations made.

Item 1. Approval of the minutes and matters arising.

The chairman announced that R. Klanner has left the PRC due to his appointment as spokesman of ZEUS. His contribution to the PRC was acknowledged.

Four new member were introduced to the PRC. L.Foá (CERN), A.D.Martin (Durham), J.Rander (SACLAY) and W.Buchmüller (DESY).

Neither K.Kleinknecht nor W.Schlatter could attend the PRC as representatives of the Scientific Council.

The chairman reported that ZEUS, as requested at the last PRC, had presented the FNC proposal to the referee W.Hofmann. A recommendation in favour of the FNC project was presented to the DESY Directorate who approved the installation.

The minutes of the 33^{rd} meeting of the PRC were approved subject to minor corrections.

Item 2. HERA schedule 93/94.

F.Willeke (DESY) reported on the status of upgrades to HERA and the schedule for 94.

A comparison of the 92 and 93 average beam conditions, achieved by HERA, shows an order of magnitude improvement in the delivered luminosity. Typical instantaneous luminosities of 7.0×10^{29} cm^{-2} s^{-1} resulted in integrated luminosities of ca. 1000 nb^{-1} being delivered to each experiment.

The lifetime instability limiting the total electron current to 2 mA (in 9 bunches), in 92, is still present but up to 20 mA (in 84 bunches) could be stored in 93. The proton beam transverse emittance and hence its size is smaller than expected. The electron and proton beam lifetimes are, typically, 10 and 100 hours respectively.

The operational reliability of HERA was improved. A number of changes were made to the control systems. Problems still remain in: the power supply system which is sensitive to distortions (lightning strikes or glitches on the supply line), in the RF system feeding to the super conducting cavities and false quenches. These problems are being rectified. Of the scheduled HERA running time 1/3 was spent in injecting and ramping and 1/3 in delivering luminosity.

Transverse polarizations of 60% were measured without affecting the luminosity delivered to ZEUS and H1. Good agreement was found between simulation and measurements of the behavior of the polarization as a function of the spin tune. A measurement of resonant depolarization allowed a determination of the beam energy with an accuracy of 3 MeV.

HERA-B tests of wire targets introduced into the proton beam were successful. These test were carried out during luminosity running for H1 and ZEUS.

The end of run machine studies were used to investigate a number of problems. The electron beam lifetime instability appears to be associated with trapped dust particles in the beam. The problem is decreased by reducing the HV on the vacuum pumps. Under these conditions 40 mA could be stored. The transverse instability of the proton beam during ramping is being cured by the installation of a feedback system during the shutdown. A proton current of 33 mA could be stored during machine studies.

During the 93/94 shutdown a number of improvements are foreseen. The east hall spin rotator system will be installed and the beamline modified to accommodate the HERMES experiment and its test equipment.

Feedback systems will be installed in DESY III as mentioned above.
The vacuum pump cabling will be modified and improvements made to the proton RF system.

HERA turn on for 94 is scheduled for the 11^{th} of April. The machine will then be commissioned for running with 180 bunches. Luminosity running will begin around the 1^{st} of June. The integrated ep luminosity in 94 should be $\sim$5 times the 93 value.

Open discussion

F.Barreiro asked why the delivered luminosity is 20 times lower than anticipated in the design. B.H.Wiik replied that the 1.5×10^{31} cm^{-2} s^{-1} peak design luminosity yields an integrated luminosity of 150 pb^{-1} when multiplied by the cannonical 10^7s year. Based on experience with PETRA this value must be divided by at least a factor of 4 resulting in an expected integrated luminosity of 30 to 40 pb^{-1} per year. Furthermore, reaching this value may require several years.

D.Saxon requested an explanation of the significance of the 27.5 GeV electron beam energy. G.-A.Voss replied that lowering the energy was not possible due to the acceptance of the spin rotators. The energy could be increased in 440 MeV steps, necessary to maintain beam polarization, and machine studies with 30 GeV electrons have been made. The penalty of increasing the energy is that all 6 conventional and the superconducting RF systems would then be required. At 27.5 GeV the failure of a single system does not result in beam loss. RF power limits at higher energies will also result in less current being stored, at 30 GeV the electron current limit would be ca. 60 mA.

W.Buchmüller asked when the 100 pb^{-1} would be attained. B.H.Wiik expected that the peak luminosity in 94 may equal the 1.5×10^{31} cm^{-2} s^{-1} design value. However to reach an integrated luminosity of 100 pb^{-1} per year would imply that the peak luminosity is raised by a factor of 3 to 4 above its design value.

A.D.Martin observed that an increase in the proton energy to 1 TeV will be an advantage to HERA-B. B.H.Wiik replied that although 1 TeV operation is possible there would be additional quench protection problems. Correction of the quench problems would require finer segmentation of the quench protection system. G.-A.Voss pointed out that the electron synchrotron radiation power loss at the design current is 7.2 MW at 27.5 GeV.

Item 3. Status of HERA-B.

The chairman thanked the HERA-B open session speaker for his presentation and proposed that the referees for HERA-B, J.Jaros and R.-D.Heuer, should report to the PRC.

Referees's report

J.Jaros

The use of RICH counters still represents an uncertainty although efforts are being made to resolve this. Of the three implementations being investigated TMAE is already in use. The pattern recognition problems associated with the RICH technique are being studied. The assumed quantum efficiency used in the simulation has been reduced by two. This and the results of a beam test indicate that progress is being made.

It is still assumed that backgrounds in the Čerenkov detector are due to photons. The referees questioned the reality of this in view of other possible background sources. The ageing effects seen in TMAE implementations need to be addressed.

Uncertainties remain in the electron identification and use in the trigger. What are the occupancy problems when a high energy electron is accompanied by other tracks ? Improvements are being made to the tungsten absorber design which should reduce the Moliére radius. The inner silicon detectors may require yearly replacement. The referees felt that work on the trigger had intensified and greeted the availability of a trigger Monte-Carlo.

R.-D.Heuer

There has been considerable progress in the tracking system. Reconstruction studies have verified the efficiency used in the proposal. Track matching between different detector elements still needs to be worked on. The point error in the silicon detector is now assumed to be 150 μm instead of 100 μm.
The μ-strip gas chambers remain a worry. Only a small prototype exists and there is a problem with the supply of conductive glass.

A number of issues are receiving attention.The manpower situation has improved with the collaboration of F.Eisele (Heidelberg). The group now proposes to use a superconducting magnet. The understanding of the target has improved. The mechanical displacement of the Si detector will allow two exposures before replacement is required.

The data acquisition still remains a problem, although a description has been compiled by B.Haynes of H1.

B.H.Wiik thanked the J.Jaros and R.-D.Heuer for their status report.

Open discussion

L.Foá pointed out that the factor of two allowed by the Si. mechanical displacement could be to small.

A.Wagner stated that SMC has installed 20 planes of μ-strip gas chamber. What is their status ? L.Foá added that GAMS, CERN North Area, are also using 10×10 cm ^{2} chambers.
R.-D.Heuer agreed that additional study was required to which B.H.Wiik added that a time schedule must be made available, to the PRC, for this work. J.Jaros said that the time available was very short and that a backup was needed. D. Saxon commented that the study should, however, not be cutoff too early. He estimated that a 1 year research phase was required with a known fallback solution.

A.D.Martin inquired about the probability of getting four B events simultaneously. W.Hofmann replied that this was unfortunately not a problem.

D.Saxon inquired about why $I_p \geq 150$ mA was required. W. Hofmann stated that the event rate is related to the distance of the target from the beam. A feedback system is foreseen to control the rate by adjusting the target distance to the beam. It was agreed that the requirement of 150 mA seemed to be slightly unjustified given Hofmann's statement.

The required 3 MHz rate would be attainable at $I_p = 30$ mA without detrimentally effecting HERA operation.

B.H.Wiik asked for the status of the superconducting magnet design. W.Schmidt-Parzefall replied that the DESY magnet group are doing some design work. It was pointed out by B.H.Wiik that additional manpower must be found since the magnet group would be unable to spend a significant amount of time on the project. W.Schmidt-Parzefall agreed and reported that a US group, who might join the collaboration, were interested in taking over the design work. It was generally agreed that the workload incurred in designing a superconducting magnet should not be underestimated.

R.Felst pointed out that the design of the beampipe was non trivial. The experiment was requested to invest more effort into this work.

A.D.Martin wanted to know how well the cross-section is known. W.Schmidt-Parzefall responded that it was not well known although measurements indicate that it may be larger, than assumed in the proposal, by a factor of two. HERA-B anticipate the cross-section to be 12 nb at 800 GeV. An accurate measurement will be presented by E789 in Moriond (QCD).

The chairman stated that the referees should review HERA-B before the next PRC and requested that the proposal be submitted by the 1^{st} of May thus allowing a PRC recommendation at the next meeting. The referees were asked to list outstanding issues which should be addressed in the proposal.

The referees noted the following issues:

- RICH counter occupancy is a major item. A real design and Monte-Carlo description of acceptances are required. These should include acceptance losses from material proceeding the counters.
- RICH ageing remains an unknown and should be addressed. (W.Hofmann stated that a Coulombs/cm charge deposition calculation could be made and compared with the literature).
- The trigger system requires some clarification. The Monte-Carlo description of the tungsten calorimeter uses EGS and it would be sensible to see the additional tail seen incorporated into the trigger simulation. Currently a Poisson distribution is simulated. Other effects such as raising energy threshold should also be quantified.
- The understanding of tracking has greatly improved since the last PRC. A similar understanding of linking tracks between different detector elements is now required.
- The situation w.r.t a data acquisition expert requires clarification. A named expert is required.
- The design of the superconducting magnet remains open. Although DESY personnel can be used initially the longterm requirement has to be satisfied from within the collaboration.

A. Wagner pointed out that the muon trigger was never mentioned. The referees responded that the comparison with ZEUS and H1 trigger conditions indicated that a muon trigger was unproblematic.

The referees added that radiation damage, in particular to the Si detector, is no longer a prime concern due to the acceptance of replacing detector elements. The alignment changes due to such replacements are also expected to be minimal as observed by other CERN experiments. The Si detectors readout pipeline would use an existing technology.

B.H.Wiik requested that a joint working group between HERA-B and HERA be established to review the experiment's requirements w.r.t. the machine. The cost of such requirements should also be evaluated. This group should also address DESY provided infrastructure such as electronics areas in the experimental hall, etc..

Item 4. Status of HERMES.

The chairman thanked the HERMES open session speaker for his presentation and proposed that the referee for HERMES, D.Saxon, should report to the PRC.

Referee's report

The referee reported that much progress has been made since the last PRC. The regular meetings with A.Wagner have been able to identify and rectify problems at an early stage. Additionally some progress has been made on the financing of the experiment.

The recommendation from the last PRC of reorganizing the schedule has been implemented. Many components will now be delivered in two or more phases removing the requirement for everything to be ready before installation. The front chambers were shipped on time.

A coordinator for the experiment's slow control systems has been found and has started work.

The trigger level 1 work has been delayed by lack of manpower. This is not considered to be an immediate problem but eventually more manpower will have to be found or diverted form another area of the experiment.

The experiment has expressed the preference that the beam dump should not occur through the experiment. Cooperation with the HERA machine group on this and other points is requested.

Open discussion

R.-D.Heuer asked whether a technical coordinator had been named for HERMES. It was pointed out that E.Steffens has been the technical coordinator for some time.

A.D.Martin stressed the importance of measurements at low x. In view of this it would be sensible to design the experiment with a possible move to LEP II in mind. L.Foá replied that the last LEPC had turned down a proposal to study polarization. The understanding is that it is to costly for a last generation experiment. HERMES should not therefore contemplate such a move.

L.Foá asked whether the apparent poor communication of the experiment and the machine groups was a historical problem or whether the problem should be addressed. In answer it was stated that the regular meetings with A.Wagner had been instigated to solve this situation. Judging from the time schedule, which has not slipped since the meetings started in October, this solution has worked.

L.Foá expressed his concern w.r.t. the small number of people involved in setting up a large and complicated experiment. If target tests were not in agreement with the calculations then the manpower situation might become critical.

G.-A.Voss, in answer to the beamdump statement made in the report, stated that currently the proton beamdump is in the west hall, i.e. in the middle of HERA-B experiment. A.Wagner's study group has made calculations for a beamdump in the east hall. This would require dumping the proton beam through HERMES. Installing additional kicker magnets after the experiment could remove the beamdump problems.

Item 5. Status of H1.

The chairman thanked the H1 open session speaker for his presentation and proposed that J.Feltesse should open the closed session by reporting on the current status of H1 and the foreseen upgrade plans.

J.Feltesse reported that the repairs of the experiment's tracking chambers carried out during the shutdown had been completed on schedule. Sense and field wires had been replaced in the Central Jet Chamber 1 (CJC1) and field wires in CJC2. The Central Outer Z chamber (COZ) had not been rewired. It was hoped that a number of non invasive improvements (shielding, electrostatics, etc.) would improve the efficiency for the 94 running. The replacement of a broken wire in the Central Outer Proportional chamber (COP) was not carried out due to the risks involved.

The Central Inner chambers CIZ and CIP have returned to DESY after repairs were carried out in Zurich. CIZ was cleaned and rewired. A new gas mixture should reduce the accumulation of deposits on the wires. The two outer layers of CIP were rewired. No ageing or wire breakage was seen but a 20% loss of wire tension was observed due to shrinkage of the Rohacell support structure.

The SM1 chamber of the forward tracker was opened and a single broken wire replaced. The uneven front field formers were straightened which should improve the breakdown characteristics.

The Beam Pipe Chamber (BPC) broken wire has been replaced and high voltage test using a different gas mixture have now started.

The upgrade plans for H1 were summarized as:

- **Triggers.** Improvements are being made, during 94, to the existing system including a new level 3 (L3) trigger using the r-z information of CIZ and COZ chambers will be introduced.
  During 95 the computing power in level 1 (L1) will be increased. A neural network will be introduced into level 2 (L2) and the computing power of the level 4 (L4) farm will be increased.

- **Leading Proton Spectrometer Roman Pots.** Background studies, ca. 80-90 m. from H1, of Roman Pots will be made in 94. These will include a coincidence with the main H1 trigger. A technical proposal for a Roman Pot installation is foreseen in the fall of 94 with the intention of installing 2 pots in 95 and 2 pots in 96.

- **Forward Neutral Counter - FNC.** A FNC to study the structure function of the π will be tested at DESY during 94. It is intended to install the FNC in 95.
- **Backward Drift Chamber.** The current upgrade of the BDC will be completed in 95.
- **SPACAL.** The SPACAL backward calorimeter is scheduled for completion in April 95.
- **Si. Trackers.** The Central Silicon Tracker and the Backward Silicon Tracker upgrade will be installed in December 94.
- **Electron Tagger.** A new electron tagger to study low y events has been proposed. Currently $0.25 \leq y \leq 0.75$ are instrumented. The new tagger will be installed in 95, 180 m. from the experiment to instrument the range $0.035 \leq y \leq 0.075$.

Open discussion

W.Hofmann asked whether the wire breakage problem was understood and what measures have been taken to improve the efficiency problems in COZ and CIZ. It was reported that a number of actions including modification of the feed-throughs, where friction effects were observed, have been made. Cleaning and rewiring of COZ and CIZ and the use of an Ar/Ethane gas mixture instead of Ar/Methane should improve the efficiency.

R.Sosnowski asked for a quantification of the ageing effects. In answering it was stated that this was difficult to specify.

J.May pointed out that the need to replace wire chambers may be forced on the experiment. This should be considered when planning upgrades.

J.May asked for the current error on the measurement of luminosity. Would this be improved by the new tagger and what were H1 requirements for measuring the luminosity. J.Feltesse stated that the luminosity measurement is currently at the 4% level. An improvement to 3% is possible by carefully reanalysing the data. The tagger will not improve this measurement. The measurement of R will require that an accuracy of 1% be achieved. The accuracy expected in 94 will be $\leq 5\%$.

R.Sosnowski asked whether the chamber HV's were to high in view of the ageing effects seen. In reply it was stated that the HV settings used were driven by efficiency considerations.

A.D.Martin inquired about the Gluon density measurements made by H1. What is the error between two neighbouring points ? These are small since the errors are clearly highly correlated. A direct measurement using the J/ψ requires the understanding of Charmonium effects, HERA measurements do not have this problem.

P.Söding asked whether ageing effects were seen in the forward chambers. It was stated that no effects have been seen.

B.H.Wiik pointed out that requests for funding must be made well in advance.

Closed discussion

R.-D.Heuer expressed concern w.r.t. problems seen in the experiment's z chambers. In view of their importance to the trigger and their low efficiency a higher priority should be given to them rather than some of the other upgrades suggested. More attention should also be given to the central jet chambers. If real ageing effects are present then the higher background rates to be expected will possibly cause additional problems. In general he would greet a decoupling of the z and central chamber issues. The same group has been developing the Si detectors and maybe there is a manpower problem. A.Wagner confirmed that testing and rewiring of the z chamber resulted in delays to the Si. detector.

D.Saxon stated that the z chambers may be overdesigned. A new design with worse performance specifications might prove more acceptable as a trigger device.

W.Hofmann was concerned about the availability of the readout chips for the BST and CST chambers. The chambers will be ready for 94 but the readout may be late.

A.Wagner pointed out that the trigger evolution is probably understandable and unavoidable. DIS type triggers are relatively stable whereas new special triggers will require effort from the collaboration.

The chairman requested that a report on the performance of H1's wire chambers be presented to the PRC in October.

The chairman announced that R.Sosnowski had agreed to act as the referee for H1.

Item 6. Status of ZEUS.

The chairman thanked the ZEUS open session speaker for his presentation and proposed that the S.Schlenstedt should begin the closed session by presenting additional information w.r.t. the proposed ZEUS presampler followed by the referee's report.

S.Schlenstedt summarized the physics goals of the presampler namely to disentangle the energy scale and the absorber material contributions on an event by event basis. A detailed costing of the detector was presented of which ca. 80% is known to be covered. In conclusion an construction time schedule was presented. The detector will be installed during the first two months of 95.

Referee's report

The document **PRC 94/01** provides information w.r.t. the physics goals of the detector. Understanding the systematics and the event-by-event corrections have been tested in the CERN test beam. The test and Monte-Carlo results agree quite well and the correction procedure has been tested and works.

For absorber material contributions of 2-4 X_0 the mean energy and $\sigma(E)$ measurements are significantly improved and the energy loss could be corrected without knowing the amount of absorber present.

The detector will use 5 mm thick, 20×20 cm ^{2}, scintillator tiles readout by 600 photomultipliers. The original readout fibre design giving 5 photo-electrons per minimum ionizing particle has been dropped in view of light collection difficulties at the photomultiplier. The basic design of the detector, however, remains conservative and well understood in view of the experiment's extensive use of scintillator based detectors.

The recommendation from the physics point of view is positive. The financing seems to be sound although 20% is not confirmed. The only worries concern the photomultipliers which are of a new design and the readout electronics the manufacture of which is spread out over a large number of institutes.

Open discussion

R.-D.Heuer asked whether the photomultipliers are in a large magnetic field. R.Klanner reported that they are at the side of the calorimeter where fields of ≤ 100 Gauss are typical. Shielding will be used wherever necessary.

R.Felst inquired about the installation time required. In answer it was stated that only 1 week was actually required.

A.D.Martin asked for a qualification of the presampler performance w.r.t. hadron showers. At CERN test with 10 - 100 GeV hadrons undergoing inelastic interactions in a target proceeding the test system had been made. The 33% resolution without absorber degraded to 44% with. This recovered to 36% using a prototype presampler. The conclusion is that the improvement is seen for both electrons and hadrons. Note however that the CERN test beam cannot simulate correctly HERA jets.

R.Klanner then reviewed the status of ZEUS upgrades.

- **Reduced beampipe and medium Q^2 calorimeter.** First order beampipe design and Monte-Carlo studies of the dead material are underway. A discussion of the upgrade will be made at the next ZEUS collaboration meeting which should result in a request for installation during the next shutdown.
- **Improved Luminosity detector.** Studies of signal pile up have been started.
- **BCAL presampler.** A BCAL presampler using the same techniques as the F/RCAL presampler has been proposed. Three scenarios are envisaged: the detector is superfluous, the detector should only be installed in regions where the amount of material is large and a full installation is required. Additional test and studies are required before a decision can be made.
- **BHES.** Two designs for the BHES system are being considered. A wire chamber solution as used in the F/RHES or a scintillator strip solution. The collaboration intends to present a proposal to the next PRC meeting.
- **μ-vertex detector.** The Monte-Carlo studies currently being made will be presented at the next ZEUS collaboration meeting. A number of technologies are being discussed.

The presentation was ended by a review of offline computing status.

Open discussion

P.Söding stated that the design of the F/RCAL presampler presented many reasons why gas chambers could not be used. Why was the gas chamber solution still being considered for the BCAL device ? R.Klanner answered that, so far, the e/π rejection of a gaseous detector compared to Si. has not yet been experimentally demonstrated.

D.Saxon inquired about the granularity required in the BCAL presampler. It was stated that the granularity must be as good as economically sensible but that it would not be as good as the F/RCAL presampler.

R.Sosnowski pointed out that event-by-event corrections are favoured in the F/RCAL presampler but not apparently in the BCAL. R.Klanner stated that the uncertainty in the distribution of absorber in the BCAL region is less critical. There is less absorber, typically $\leq 2X_0$, and the spatial distribution is more homogeneous. A measurement of a small region of ϕ is possibly good enough. W.Hofmann added that the justification for a BCAL presampler was not as clear as the F/RCAL presampler.

J.May asked whether the offline computing resources available would cover the 94 data taking requirements. R.Klanner stated that with the present setup and a similar archiving rate as seen in 93 the computing resources should be sufficient for the 94 running period. An increase in the disk storage will probably be required for efficient analysis. The reconstruction programs are being improved but the time required per event will not improve due to the activation of new detectors.

B.H.Wiik requested a list of the topics ZEUS would present at the next PRC. The reduced beampipe, BCAL presampler and B-HES upgrades could be presented.

Closed discussion

The PRC recommended that the proposed F/RCAL presampler be accepted. It was suggested that the referee should monitor the photomultiplier developments.

W.Hofmann stated that a BCAL presampler proposal at the next PRC would be difficult to support. Ideally experience gained with the F/RCAL presampler should be accumulated before considering the BCAL presampler.

L.Foá suggested that ZEUS consider the μ-vertex detector when designing the reduced beampipe.

Item 8. Miscellaneous.

The chairman suggested that the next PRC focus on the HERA-B proposal. HERMES, H1 and ZEUS would therefore be asked not to present material for discussion at this meeting unless urgent.

The next PRC meeting will be held on Tuesday the 31^{st} of May.

Item 9. Future PRC schedule and summary of recommendations made.

The following PRC meetings have been scheduled:

- **31^{st} May 94 (Tuesday) HERA-B proposal**
- **17^{th}-18^{th} October 94 (Monday-Tuesday)**

The May PRC will review the proposal for HERA-B.

(C.Youngman - 30^{th} April 1994)