Minutes of the 36th Meeting of the PRC

DESY 17th - 18th October 1994

PRC members present:

F.Barreiro (Madrid), W.Buchmüller (DESY), R.Felst (DESY), R.-D.Heuer (CERN), G.Heinzelmann (Hamburg), W.Hofmann (MPI-Heidelberg), A.D.Martin (Durham), J.May (DESY), J.Rander (Saclay), D.H.Saxon (Glasgow), [18th] R.Sosnowski (Warsaw), G.-A.Voss (DESY), A.Wagner (DESY), B.H.Wiik (DESY,chairman), N.Wermes (Bonn), C.Youngman (DESY,secretary)

Non PRC members present:

HERA - R.Kose (DESY). [17th]
ZEUS - R.Klanner (DESY), B.Löhr (DESY), J.Labs (DESY). [17th]
H1 - W.Bartel (DESY), J.Feltesse (Saclay), U.Görlach (DESY), C.Niehbuhr (DESY), U.Straumann (DESY), J.Tutas (Uni-Heidelberg) [17th]
HERMES - J.van den Brand (NIKHEF), E.Steffens (MPI-Heidelberg), M.Vetterli (TRIUMF) [18th].

The PRC received the following documents:

PRC 94/03
Proposal for a Forward Proton Spectrometer for H1. H1 collaboration.

PRC 94/04
Proposal for new Detectors to Increase the Proton Tagging Acceptance. H1 collaboration.

PRC 94/05
Proposal to DESY for a Longitudinal Electron Polarimeter at HERA - East Section, HERMES collaboration.

Open session. Oct. 17th, 10:30, Main Auditorium

HERA status report. B.Holzer, DESY.

H1 status report. C.Niebuhr, DESY.

Report on the H1 FPS upgrade. F.Buesser, HH II Institute.

ZEUS status report. J.Labs, DESY.

HERMES status report. J.van den Brand, Wisconsin/NIKHEF.

Closed sessions: Oct. 17th - 18th, 14:30-18:00 and 9:00-12:30, Sem. Rm. 1

1. Approval of the minutes and matters arising from the last meeting.
2. ZEUS upgrade status.
3. H1 upgrade status and FPS referee's report.
4. HERA-B machine interface report.
5. HERA-B status report.

6. HERMES referee's report.
7. Report on the experiment coordination meeting of 21^{st} September.
8. 1995 machine schedule.
9. Miscellaneous

Item 1. Approval of the minutes and matters arising.

The chairman announced that L.Foá (CERN), J.Jaros (SLAC) and P.Söding (DESY-IfH Zeuthen) were unable to attend the 36^{th} PRC. Additionally the Wissenschaftlicher Rat representative, K.Kleinknecht(Mainz), could not attend.

The minutes of the 35^{th} meeting of the PRC were approved.

Item 2. ZEUS upgrade status.

R.Klanner presented the ZEUS upgrade status report. Upgrades in the experiment's detector, data acquisition and offline capabilities are being implemented or are foreseen.

Detector upgrades:

- Extension of γ tagging.
  The soft γp production trigger rate, without pre-scaling, saturates the DAQ system. The introduction of exit windows in the beamline would allow crude energy measurement devices to reject background and electron position measurement devices to precisely determine Q^2 and $W_{\gamma p}$. These upgrades are being studied.

- New beampipe and beampipe calorimeter BPC
  The detector's Q^2 cutoff, ~ 2 GeV^2, is defined in 94 by the rear calorimeter. A new beampipe will be installed in January allowing a beampipe calorimeter to be inserted. These will instrument the range $0.15 \leq Q^2 \leq 0.85$ GeV^2. The calorimeter is a tungsten-scintillator sandwich with alternating orthogonal readout strips. Installation is planned for the 94/95 shutdown.

- Forward neutron calorimeter FNC III
  An upgrade of the installed FNC II has been assembled and calibrated with a 120 GeV beam at CERN ($\sigma_e = 31\%E^{-1/2}$, $\sigma_h = 62\%E^{-1/2}$). In operation the FNC can be calibrated with Co^{60} sources or during proton beam ramping by measuring pN$\rightarrow$nX at 120 GeV. The later would require a 10 minute pause in ramping at the desired energy. The detector will be installed in January.

- Leading proton spectrometer LPS
  The 6 Roman Pots used during the 94 data taking had 28 Si-strip and 6 trigger counters installed. The Roman Pots will be completed by the installation of the remaining 26 Si-strip detectors during the 94/95 shutdown.

- Hadron electron separators HES
  The rear hadron electron separator RHES, 10464 30×33 mm^2 Si-diodes, was operated successfully during the 94 data taking. The forward FHES, 10128 diodes, will be fully installed during the 95/96 shutdown with the exception of 1 module which will be installed during the 94/95 shutdown. Currently 30% of the diode mountings, skis, and 10% of the diodes are available. A decision w.r.t. a hadron

electron separator in the barrel region, BHES, will be made during the November 94 collaboration meeting.

- Presamplers
  The forward and rear presamplers will be installed in February 94.

- μ-vertex detectors
  The new beampipe foresees a 30 mm gap for the insertion of a μ-vertex detector. No group has sofar been found to implement such a detector.

Data acquisition upgrades:

- Event builder
  The existing transputer based cross bar switch design of the event builder foresaw a 100 Hz maximum second level trigger rate. A simulation study has been started to investigate its replacement by a higher bandwidth network switch technology. A decision is scheduled for July 95.

- Third level trigger TLT
  The TLT operated during 94 with 1000 MIPS of computing power. An additional 1000 MIPS is currently being installed. Funding requests have been made by the Canadian TLT group which will result in a further doubling of the CPU power during 95.

- Datalink to DESY archive
  The present IBM archiving system is being replaced by a direct FDDI link to the computer centre AMPEX tape archive. This will be fully operational by February 95.

Offline upgrades:

- Event reconstruction
  The 94 data taking CPU and disk storage needs of the experiment were satisfied by the hardware available. A doubling of the CPU power for 95 is foreseen with a slow increase thereafter.

- Physics analysis
  The storage of one year's mini DSTs, requiring $\sim$500GB of disk storage, has been funded by the collaboration. The disk storage requirement is expected to grow by 100 GB per year.

- Monte Carlo generation
  Approximately 1 M events are now generated per week, whereby 75% are generated at the collaborating institutes.

Open discussion

A.Martin asked how the pion exchange reaction would be isolated. R.Klanner replied that the new FNC will provide more acceptance in the low Q^2 region. The FNC can be seen as complementing the LPS.

B.Wiik asked what the lowest t measurement would be. R.Klanner stated that this would be t_{min}.

R.Sosnowski asked whether radiation damage of the LPS Si-strips had be observed. R.Klanner replied that no such effects had been seen.

N.Wermes inquired about the efficiency of the Si-strips. R.Klanner stated that this was 100% whereby this number did not include the inefficiency due to the electronics.

B.Wiik requested that a date for presenting the PRC with a μ-vertex proposal should be defined and asked whether such a device would improve the charm trigger efficiency. R.Klanner replied that the expected high cost and requirement of gaining experience of the current detectors did not allow a date to be set. F.Barreiro added that the current charm efficiency was 10% and that this would be increased by the γ tagger.

B.Wiik asked whether the detectors data archive rate was expected to increase with higher HERA luminosity. R.Klanner stated that the output trigger rate of 5-8 Hz would remain.

J.May stated that the use of ULTRANET was being phased out. He requested that H1 and ZEUS consider solutions for accessing data at the 10 MB/s rate during the future development of their data analysis requirements. It was pointed out that if a hardware solution could be ordered now its implementation would still require 1 year.

G.Heinzelmann asked how the collaboration transported the Monte Carlo datasets. R.Klanner stated that this was achieved by distributing EXABYTE tapes.

N.Wermes stated that the LPS total seen luminosity was less than that seen by the full detector. R.Klanner replied that safety issues concerning possible damage of the detector had resulted in very strict criteria being applied before driving the detector into the beamline. In 20-30% of runs the backgrounds were either too high or the proton beam was in the wrong position. When asked to specify the resolution seen by the LPS it was stated that 8×10^{-4} p_l and 20-25 MeV in p_t were measured.

W.Buchmüller asked which Q^2 range could be covered at larger x for diffractive events. F.Barreiro stated that the range $10 \leq Q^2 \leq 10^3$ GeV^2 is covered. A.Martin pointed out that there is a Q^2 gap between 0.85 and 1.6. R.Klanner stated that this was true and that a larger BPC was being considered to fill this.

Item 3. H1 upgrade status and FPS referee's report.

U.Straumann presented the H1 upgrade status report.

Detector upgrades:

- SPACAL
  The production of SPACAL modules is proceeding at 10-30 submodules per week. Supermodule production is proceeding smoothly. Of the 60 supermodules required 48 have been produced. Extensive test using a 4 GeV electron beam at DESY have been made whereby the signal output and module homogeneity have been measured. The initial problems, resulting in variable quality of modules, have been solved. The production of additional modules will mean that these modules will not be used. The fine-mesh photo multiplier tubes have now been tested. The SPACAL electromagnetic and hadron detector sections will be assembled before the

end of the year.

- Backward Drift Chamber (BDC)
  Subsystems of the digital and analog readout have been tested at H1 during HERA operation. The chambers will be wired in December and shipped to DESY in January.

- Central and Backward Si Tracking detectors (CST and BST)
  The pipeline readout chips have been delayed. A batch of redesigned chips arrived at the end of September and these are now being tested. Of the 192 detectors required 81 have sofar been delivered.

Open discussion

B.Wiik requested that the SPACAL installation be discussed first.

R.Sosnowski stated that he was impressed by the quality of the lead manufacturing techniques being used. The initial mechanical problems have been solved and the standard and non standard elements will be available on schedule. There remained however a worry about the delivery of the front end card electronics. U.Görlach replied that Paris VI remain confident that the electronics can be delivered by the end of January. Tendering was late but a manufacturer has now been found.

B.Wiik asked whether the electronics design had been tested. It was stated that this had been done.

J.May asked whether the electronics PCB design was new. U.Görlach replied that the board is identical to the last prototype series board.

R.Sosnowski suggested that in view of the extensive submodule test series it would be a good idea to remeasure some of the initial modules to investigated ageing effects. No problems would be expected but in view of the use of light fibres this would be reassuring.

A.Wagner asked how the performance of the final modules compared with the design specifications. U.Görlach replied that the spacial, time and energy resolutions measured were consistent the design values. Some inhomogeniety existed when scanning between modules.

A.Wagner asked how long the installed detector would require for calibration. U.Görlach stated that the inner modules, which see higher rates, would be calibrated within a few days of running. Attaining an overall calibration at the 2% level would require one year of running.

B.Wiik ended the discussion of the SPACAL detector by anticipating it's installation and successful working during the 95 data taking period.

B.Wiik proposed that the photon tagger, PRC 94/04, be discussed.

B.Wiik asked whether the design had been discussed with the HERA machine group. R.Felst replied that Kouptsidis and Brinkmann, from the machine, and both ZEUS and H1 had had discussions. A possible installation in the 95/96 shutdown was thought to be possible, whereby the DESY design office would be required to produce a detailed design. Following the 94/95 shutdown the vacuum group would then be required to design and manufacture required components.

A.Wagner pointed out that ZEUS had apparently presented different locations for it's taggers. What is the agreement between the experiments ? R.Felst stated that 2 of the 3 positions are the same (38 and 188m). The remaining position was being recalculated with the intention of making the installation two experiments identical.

R.Sosnowski asked whether it would be necessary to retract the detectors due to background rates. R.Felst replied that during injection and acceleration such a procedure might be required.

B.Wiik stated that the photon tagger design needed to be reviewed with the machine groups involved to ensure that the work required was understood and that it could be carried out.

In summary B.Wiik stated that the next PRC should make a decision about the H1 tagger proposal.

N.Wermes opened the discussion of the CST and BST detectors by stating that the pipeline chip production had caused a delay in the project but that all other work was on schedule. The ACP 200 chips delivered at the end of September have better noise and offset characteristics than in the proposal, thus the proposed S/N ratio of 10/1 looks possible. Additional manpower may be required for the development of the associated master clock signal generator and readout channels.
The BST PAD detectors for the trigger are complete including hybrids although only $\sim$ 20% of the r- and phi-strip readout will be installed due to the ACP 200 pipeline chip shortage. The PAD detectors and electronics can be ready for installation in February.
The proposed carbon fibre beampipe has suffered a major problem in that it has bubbles. Therefore an aluminium beampipe will be used. This introduces five times more material.
The installation schedule currently foresees installing as much of the CST and BST as possible, whereby no prolongation of the shutdown will occur. What cannot be installed will be installed during the next shutdown.

J.May pointed out that the schedule was very tight. Delays in the schedule should not be used to redesign elements on the fly. J.Feltesse stated that the basic design is frozen.

R.-D.Heuer asked whether the carbon beampipe design is being pursued. It was stated that a decision will be made at the end of 94.

Referee's report on the FPS.

N.Wermes and R.Sosnowski
Tagging in the forward direction is important for investigation of the Pomeron process. The FPS is therefore a needed upgrade of the H1 detector.
It is not clear that the Scintillator fibre design is the correct choice, never the less, the design is feasible and is the only one that can be produced within the budgetary and time restrictions. A 1% measurement of energy can be obtained by a 100μm position measurement.
The mechanics of the design and the retraction drive are well understood.
The current design will, however, require refining. The low efficiency due to light

collection difficulties are the major deficiency. The PRC should recommend that more work be carried out in this area.

Open discussion

R.Sosnowski asked why H1 and ZEUS appeared to have a different understanding of the importance of the detector acceptance in the plane of the accelerator. W.Bartel replied that a simulation had shown that there are no events lateral to the beamline. ZEUS detects lateral events at the 40m pots where, before the vertical bend, there is dispersion only in the horizontal.

W.Hofmann pointed out that 4.5 photo electrons are measured now, this number may degrade in the final installation. W.Bartel answered that the fibre readout length is short and attenuation effects should not occur.

W.Buchmüller requested the x range of the FPS detector. W.Bartel stated that acceptance range is the same as that of the ZEUS LPS.

A.Wagner asked what physics is effected by the accuracy of the position measurement. W.Bartel replied that tagging is independent of the intrinsic accuracy of the detector.

The discussion was interrupted at this point and resumed at the beginning of the Tuesday session.

W.Bartel reiterated H1's intensions to use the FPS to study Pomeron production. In this sense it is different to the ZEUS LPS which was originally designed to investigate elastic vector meson production. The FPS and LPS have intrinsically the same resolution whereby the principle contribution is the alignment error w.r.t. the HERA proton beam. A 10μm resolution beam monitor, see proposal, is designed to address this contribution. The pot alignment error of 50μm over 100m will then be the dominant uncertainty. The FPS and LPS are therefore different, with the FPS having fewer stations.

D.Saxon asked whether the single layer efficiency of $\sim$62% indicated that the detector was operating in a region of rapidly changing efficiency. W.Bartel stated that the geometrical inefficiency was included resulting in the apparent low efficiency.

B.Wiik asked whether additional costs would be incurred if the design was modified to measure higher energy protons. W.Bartel replied that this would certainly be more expensive. An option of a station at 60m for higher energies would also be expensive due to the complicated mechanical design required.

B.Wiik asked for the upgrade requests that H1 would expect to make w.r.t. the FPS. It was stated that an additional 4 stations might be requested using the current or a different technology. A.Wagner suggested that a 6 station solution with the current technology would not be acceptable due to the efficiency.

Closed discussion

The chairman observed that: 1) Pomeron physics is important, 2) ZEUS have an installed detector which would profit from a competing detector, 3) the 2 pot FPS solution may not be technically ideal and 4) the FPS upgrade plans look uncertain.

R.Sosnowski added that the 2 station FPS is adequate for the Pomeron study given a beam position monitor and a good understanding of the beam. D.Saxon concluded that 4.5 photoelectrons was adequate provided the apparent inefficiency was due to geometry.

A.Wagner stated that the test results shown indicate a good homegeniety between two stations which would be unlikely if efficiency problems existed. Additionally ρ production could be used on a run by run basis to track the efficiency.

B.Wiik asked whether the knowledge of the beam vertex was important. N.Wermes replied that this was required to calculate the proton momentum.

R.-D.Heuer concluded that the current FPS 2 two station design was sufficient to study the Pomeron but doubted whether a 6 station upgrade was feasible. A third station to independently measure the vertex position would require an efficiency close to 100%.

B.Wiik concluded that three options were available: 1) accept the two station design but require that no extensions to the system should be made without presenting results from the present system, 2) state that the physics is good but ask H1 to come back with a better technological solution and 3) reject the proposal.

The chairman then asked the PRC members to state their preferred option. Option 1 was supported by all members. H1 would be asked to continue with the design and its installation.

Item 4. HERA-B machine interface report.

R.Kose presented a review of the HERA-B machine interface work.

The HERA west beamline was designed in 86 and contains many elements essential to the running of HERA. The introduction of HERA-B requires a redesign to additionally satisfy data taking requirements.

The important changes w.r.t. HERA-B operation are listed below.
The proton beam kicker system will be redesigned. This and a change in the beam optics will allow the smaller first kicker to be installed 18m from the target. This is still within the experiments μ filter but is thought to be acceptable.
The proton scraper system will be modified to reduce halo in the experiment.
The magnet of the detector will be interlocked to the machine. It will ramp with the machine during acceleration.

Additionally a number of changes will be required to maintain the machine performance.
The effect of the experiments magnetic field on the electron beam will be compensated by a special coil and shielding.
The electron beam polarimeter will have to be moved, currently no design decision has been made.
Some changes in the machines feedback and magnet elements may additionally be required.

R.Kose summarized that, although some solutions are still required, the installation of HERA-B was now possible.

Open discussion

R.-D.Heuer asked whether the foreseen changes are compatible with higher HERA beam energies. R.Kose stated that the solutions are consistent with 1 TeV proton beam energies.

A.Wagner asked for an estimate of the difficulties of solving the scraper problem.
R.Kose replied that it may be necessary to split the horizontal and vertical main

collimators to modify the scraper installation.

G.Heinzelmann asked whether the requirement of ramping the HERA-B magnet would reduce the efficiency of HERA. It was stated that it would not w.r.t. HERA and that HERA-B had always assumed that this would be required.

R.Felst stated that the improved performance observed in HERA was due, in part, to the stability of the power supplies. B.Wiik stated that the HERA-B installation would not significantly alter this situation.

Item 5. HERA-B status report.

W.Hofmann reviewed the status of HERA-B.

The principal physics aims of the experiment are the measurement of CP violation effects. The current experimental uncertainties are expressed by the area of the $\rho\eta$ kidney. The area of this is expected to shrink by a factor of two before HERA-B goes online.

The collaboration has been strengthened. The original proposal listed 15 collaborating institutes, since the open collaboration meeting 4 new collaborators have joined and 5 groups are interested in joining. Additional groups have expressed an interest.

The process of freezing design issues and simplification has been continued.
A conventional non superconducting magnet design is now favoured. MSGC's are now favoured in the design of the inner tracker. The TRD/tracker design has been simplified in that only a TRD in the forward region will be implemented.
The CsI and TMAE RICH readout designs have both been proven to work although the TMAE solution sees 60-70% of the expected photoelectrons. The problem that now has to be solved is the decision about which system to drop.
The detector costs have remained approximately constant during the simplification and staging process. The schedule for a staged installation, starting 95, was presented. This foresees early datataking with the installed staged detectors, thus allowing a progressive implementation with physics runs in 98.

Open discussion

R.Sosnowski stated that the detector was now considerably shorter and asked whether this moves the dump kicker completely out of the μ filter. W.Hofmann replied that this had already been taken into account and that the kicker remains within the filter. No Monte Carlo results were available, but it was thought that the new kicker position would be acceptable.

A.Martin asked whether HERA-B would recommend an increase in the proton beam energy. W.Hofmann answered that the first requirement is to understand the detector and determine the net B yield.

D.Saxon stated that the confidence of HERA-B in its ability to trigger correctly was high. W.Hofmann replied that the μ trigger was well understood. The e trigger would still require a lot of additional work with uncertain outcome.

J.May stated that the data storage requirements would be at least an order of magnitude greater than those of H1 or ZEUS. This is currently a problem with no technical solution available onsite. A detailed study of this problem is required.

D.Saxon stated that this is a more general problem and that the LHC experiments would also be expected to address this question soon.

R.-D.Heuer asked whether the lower B field and reduced detector aperture would prove problematic to the experiments physics aims. W.Hofmann stated that this was not expected to be a problem.

R.Felst stated that the new beam dump system would give larger β-functions at the target. W.Hofmann replied that 35m was the design value and that $\leq$50m would be acceptable.

B.Wiik thanked the speaker for his review and congratulated the HERA-B collaboration on the progress they had made.

Item 6. HERMES referee's report.

D.H.Saxon
The collaboration has made significant technical progress and additionally the detailed time schedule has been made and is being kept.

A number of machine related issues remain open.
The P_L polarization is not measured directly, instead P_T is used. This problem is addressed by the design proposal for a P_L polarimeter, PRC 94/05.
The maximum He^3 density permissible for an acceptable electron beam lifetime is uncertain.
Beampipe magnet field shielding issues remain unresolved.

The collaboration strength, which one year ago was weak, has been improved by the addition of external collaborating institutes and the support now been provided, at the technical level, by the DESY MEA group.

The 95 run now foresees using a He^3 target. SLAC will run during fall 95 at 50 GeV and $P_L \geq 80\%$ and expect to reduce their statistical and systematic errors on $g_1^p(x)dx$ by 50%.

The computing needs of the experiment are expected to be 30×10^6 good events plus ~ 5 times the background rate. The processing time required per event remains unknown and no account has sofar been for the Monte Carlo samples required.
In view of these large computing needs a strategy is required for analysing the 95 data.

Open discussion

B.Wiik asked why the current P_T measurement is not good enough. J.van den Brand replied that the current error on P_T is 8%. This error would have to be reduced to $\sim$2% to be acceptable. A series of systematic tests have been started to study this but no results are available.

A.Wagner asked whether the uncertainties come from the polarization rise time or the asymmetry measurement. M.Vetterli replied that the uncertainty was probably due to both. E.Steffens added that the asymmetry measurement required a good Monte Carlo understanding of the beam.

D.Saxon asked when the P_L proposal would be considered. B.Wiik replied that the proposal would be given to the machine group immediately and that in the meantime the understanding of the P_T error should be addressed.

B.Wiik stated his worry about the sudden change to a He^3 target. D.Saxon replied that this target would be quicker to understand and that it was a good choice in view of the schedule of the SLAC experiment.

J.van den Brand explained the computing requirements of the experiment. Assuming 150×10^6 events/year and 200/mip/sec/event then 11400 mip/months was required if 6 months for analysis were available. HERMES recognised the advantage of onsite computing and will provide a proposal to DESY shortly.

R.-D.Heuer asked whether Monte Carlo generation would be performed at the collaborating institutes. It was stated that this would be the case.

B.Wiik pointed out the advantage of having a large group analysing data at DESY. R.-D.Heuer added that the requirement of competing with other experiments would needed strong central organisation.

The chairman summarized the consensus by stating that He^3 running in 95 was a good choice although an understanding of the P_T is still required. Additionally HERMES should provide a list of computing requirements to DESY.

Item 7. Report on the experiment coordination meeting of 21^{st} September.

A.Wagner summarized the coordination meeting. Six talks were given at the meeting, two from the machine and four by the experiments: H1, HERA-B, HERMES and ZEUS.

M.Klein, representing both H1 and ZEUS, reported on the strategy for measuring the logitudinal structure function F_L. This measurement requires running at two centre of mass energies. Monte Carlo studies indicate that 10 pb^{-1} and 5 pb^{-1} at 820 and 500 GeV proton beam energy respectively with 27.5 GeV electron beam energy are favourable. Both measurements should be performed during the same year, preferably by changing E_p serveral times, to minimize systematic errors. Due to the required total luminosity of 15 pb^{-1} both collaborations foresee F_L measurement in 96. This assumes that the machine can achieve a similar integrated luminosity in 95.

F.Sculli, also representing both collaborations, made a plea to obtain as soon as possible a very high luminosity. This is needed to test electroweak physics and to search for exotic phenomena. He pointed out that the return to e^- running is needed in order to measure the difference in e^-/e^+ quark coupling. The installation of spin rotators makes sense only when the luminosity has reached a value close to the design specifications. They should therefore be installed after the F_L measurement.

J.van den Brand presented the status of HERMES and discussed first results from the test experiment as well as running scenarios fro 95.

W.Hofmann gave a progress report on the HERA-B experiment.

All participants concluded that the meeting and the preperation for it provided a useful forum for clarify the different aspects of future running. The meeting would therefore be repeated annualy.

Open discussion

B.Wiik stated that the 40 pb^{-1} needed for a e^-/e^+ comparison will require 2 years of e^+ running. This is consistent with the machine schedule of returning to e^- operation in 97. Running with a 500 GeV proton beam energy in 96 would also be favourable since HERA-B will certainly require 820 GeV in 98.

W.Buchmüller pointed out that Tevatron limits on right handed currents are strong. If HERA could reach 100 pb^{-1} before LEP II there might be a chance of observing supersymmetry.

Item 8. 1995 machine schedule.

The HERA schedule for next year was outlined by B.Wiik.

The 94 physics running will end on the 6^{th} November after which machine studies will continue until the end of November.

HERA physics running will resume 1^{st} April 95.

An increase in the instantaneous luminosity by a factor of 3 is anticipated.

Item 9. Miscellaneous

HERA-B approval should be given by the directorate in January 95. This requires clarification of outstanding machine, manpower and funding issues. HERA-B should therefore produce a slimmed down technical design report. The referees will be asked to review this report and discuss it at the next PRC meeting.

The following dates are foreseen for PRC meetings in 95:

- January 26-27^{th}.
- May 15-16^{th}. This is a placeholder
- September 4-5^{th}.

(C.Youngman - 10^{th} December 1994)