

Steering Committee meeting held in Paris on May 15-16, 2006

Participants: Marco Circella, John Carr, Patrick Lamare, Jean Pierre Schuller, Juanjo Hernandez, Paschal Coyle, Pascal Vernin, Jurgen Brunner, Vincent Bertin, Robert Lahmann, Maarten de Jong, Jean Roux, Stefano Cecchini, V. Flaminio

1) Electronics (Robert Lahmann)

Positioning Hydrophones (P. Keller)

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No special news from electronic;

The delivery of last electronics boards and their corresponding hydrophones (with new design) foreseen during the 1st week of June.

SCM boards (R. Rethore)

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Total prod.: @Bari: ready to ship:

SCM_CLOCK	16	5	11
SCM_REP1	14	5	2
SCM_REP2	14	5	2
SCM_WDM	14	5	1

xLCM backplanes (L. Caponetto)

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"Excessive glue problem" reported for last SC has been fixed

boards available at integration sites for line 2 and onwards:

33 MLCM boards @Bari (5 per line)

64 LCM boards @Catania (10 per line)

23 LCM boards @Pisa (10 per line)

DWDM boards (J. Hogenbirk)

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Production back on track (Caught up with some delays of the past)

2) Electronics Integration (Marco Circella)

Status for line 2 (15 May 2006):

- All LCMs shipped to France in the past weeks
(reminder: 15 built in Pisa, 5 in Catania)
- MLCM for first sector shipped to France last week
(note: it underwent the functional test, but not the calibration)
 - SCMs for lines 2 and 3 will be shipped to France this week.
One has already been integrated and tested. Second one being integrated today; will be shipped to France by Friday.

Note during discussion: Line integration is foreseen to start on Wednesday of this week! Marco will have to arrange things in such a way that shipment of first SCM takes place tomorrow (May 16).

- All remaining MLCMs will be shipped to France by next week

Schedule for next lines:

- integration of modules for line 3 will start in early June
=> all modules will be ready by mid-July
 - implications of possible problems of manpower in Bari need to be investigated
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3) Mechanics (Pascal Vernin)

-EMC

-EMC qualification:

- X ray inspection of penetrators of 3 nwb EMCs of preseries: OK
- pull test on the penetrator bushing (w.r.t. the potting): OK

-EMC delivery for line 2:

-NWB EMC 12.5m long

- 13 (out of 20) delivered (or coming soon):
 - 11 without any bad fiber
 - 1 with 1 bad fiber
 - 1 with 2 bad fibers

-WB EMC

- the 98m long was tested at Brest and has 2 or 3 bad fibers
- 2 (out of 4) 12.5m long without any bad fiber

-GENERAL:

- since last complain to the manager of MacArtney, the quality of the work is improving (on time since 3 weeks!)
- green light for other lines this week

-IL

- the damaged IL will (did?) arrive soon to ODI

- an extra spare 350m ordered
- BSS
 - release tests in air were performed WITH THE CONNECTOR. A new type of blocking was observed from the connector
 - The two experts of IFREMER driven by Marc Luccioni were present. They will give us their conclusions and recommendations in a meeting next week. See summary of conclusions attached.
- The point seems to be that a blocking may occur (under unfavorable conditions) at a much smaller angle (1°7) than originally thought (17°).*
- OMF(line 8 to 12):
 - under manufacturing since Antares agreed to postpone the delivery until end of October 2006
- OM supports
 - design change due to damaged OM spheres on line Zero: add a small HDPE spacer in a new hole drilled in the OM support
 - already delivered OM supports :
 - all the spacers are delivered at CPPM
 - line 2: CPPM drilled the holes
 - line 3 to 6: will be done at Saclay
 - new call for offer (lines 6 to 12 according to an updated design) on the web since last week
- LCM containers
 - 2nd "tranche conditionnelle" (line 8 to 12): delivery expected in June according to an updated design (chamfer issue). Then control and connector mounting at CPPM

It has been added that 8 weeks are needed for the production of line3 cables. All of line 3 will be integrated in Saclay starting around mid July and finishing in October. Line 4 will be integrated at CPPM starting in September and finishing by early November.

4) Instrumentation (Vincent Bertin)

1. Acoustic positioning system :

New hydrophones production:

- After a successful qualification of the 4 prototypes of new hydrophones (using a new soft glue); the hydrophones have been opened in order to have a visual inspection on the intrinsic parts (ceramics, soldering, ...)
- This dismounting pointed out that due to the weak adherence of the polyurethane elastomer glue on the very polished ceramic surface, a relative low force is sufficient to detach the syntactic foam
- ECA proposes to add an epoxy glue as a primary interface between the ceramic and the elastomer to avoid the risk of a foam detachment

- A short serie will be finished by the end of May. These hydrophones will be calibrated and tested in pressure tank before integration on Line 2.
- Sharing of cost between ECA and CPPM for the production of the new hydrophone is still under discussion. We propose to ECA to take charge the calibration cost of the 1st tranche corresponding to 32 hydrophones. ECA gave a verbal agreement, but not yet an official written one.

Line2 integration:

- Old design hydrophone will be used during Line2 integration at CPPM and Saclay to test the acoustic module electronics.
- Hydrophones, documentation and software configuration files have been sent to Saclay for the acoustic tests.

2. Tiltmeters-compass

- The manufacturer PNI is now producing a new version TCM3 of the tiltmeter-compass board, more compact and robust. He is also proposing a TCM2.5 version based on the TCM3 technology, but fully compatible with TCM2 interface and geometry.
- Some new TCM2.5 boards have been bought by Valencia, 2 samples of will be evaluated at CPPM in the next days to check the compatibility with the previous version TCM2.

3. Led Beacon

- Beacons for Line 2 + spares are ready at CPPM and Saclay
 - Production of new Led Beacon is going well:
 - 15 Beacons produced in 30 days, 6 have been calibrated
 - Beacons for Line 3 calibrated and assembled into containers
 - Beacons for Line 4, Line 5 and half of Line 6 are mounted
 - Plan is to produce Beacons for one Line in 20 days
 - 6 new Led Beacon containers have been ordered by CPPM; more containers will be purchased by Erlangen ?
 - On going discussion with Nautilus and integration team concerning tightening torque on screws used both to close the container and its mounting on the OMF: <1.2 Nm specified by Nautilus while 6 Nm (M4 screws default torque) was previously used by integration team for the Line1 beacons → Decision needs to be taken soon for Line2.
 - Proposition for the future line beacons to assemble the Led Beacon mechanical support pieces at Valencia during the closure of the container, and then to perform a pressure test of the fully ready beacon before its delivery to the integration sites.
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5) Line Integration (Patrick Lamare)

Documentation:

- Final version of sector test procedure quite ready

Line 2 integration:

- Integration of the line started on 9/05 as planned
- Storey 5 fully integrated and tested, storey 4 planned to be finished today

- Line 2 integration at Saclay will start next week with few days delay due to the late delivery of some mechanical tool and unexpected problems of manpower

Component delivery status:

EMC ok (enough for integration)

LCM at CPPM

SCM and MLCM delivered next week

LOB some available

Hydrophone: final one available in 1 month, sector tests performed with functional one

Saclay facilities:

- Training of Saclay assembly team this week at CPPM

Tests:

- Test system quite ready, clock and daq tested with LCM ref, DWDM will be tested as a MLCM was received
- Amplitude calibration will be performed next week with a small PM used at CPPM (different system of tuning between the 2 sites)

Tools:

- Mechanical parts for the tools delivered with some delays. Tools planned to be ready beginning of next week

xCM connector mounting:

- Flanges for the lines 2 and 3 in Italy
- 1/2 of flanges of line 4 in Italy, 1/2 stored at CPPM
- Flanges of line 5 ready to be sent in Italy
- Flanges of line 6 ready successfully pressure tested; ready to be sent in Italy
- Flanges of line 7 ready to be pressure tested
- Leak observed on 1 LCM during pressure test: No explanation after checking, new mounting and new pressure test planned

6) Sea operations (Jean Roux)

1. Deep sea cable.

As indicated previously the 3000m deep sea cable have to be changed. A new one have been ordered and should be delivered within 8/10 weeks from the 10th of may. The cost is close to 16000euros.

Should the cable not be available for deployment of line2, a cable will be obtained on loan from IFREMER.

Agreement has been got with Foselev which is going to install on Castor a fresh water cleaning system in order to remove salt during cable recovery operations in order to minimize corrosion.

2. Castor DP system

As indicated previously the DP system (software and control/command) of Castor is dead and have to be changed. Foselev ordered already a new equipment which is not expected to be installed before the end of summer: I consider that this is not a reason to postpone the line 2 deployment because with the fine weather conditions required for line deployment a manual drive of Castor is enough to get sufficient accuracy in positioning the BSS.

3. Castor's Captain

There will be soon a new Castor's captain.

4. IL cable turret "lost?"

We have been at sea just after Cassis meeting with the GG9 ship in order to search acoustically for the turret and the environment line.

We've got 2 answers on the turret frequency but there is no full confidence.

There is a chance that the turret is not far from the site and we intend to search with Victor few hours during next connection operation.

Nautille will be operating around the Antares site over the next weeks. It will try to locate the turret. Nautille may also try to investigate the problem with "Test 1" the autonomous line installed about 1 km away from the Antares site, that has not responded any longer. On Tuesday Jean refers of a phone conversation with IFREMER people. It appears now that Nautille may be operating on the Antares site at the end of July instead of end May. In this case it might not be impossible to go ahead with the connection of line2 on that occasion.

Anyway we are studying a new concept of turret, simple, cheap (maybe perdable), without risk of drift, permitting to save time and to maintain the aim of connecting max number of new IL cables ready on seabed for next connexions on BSS only.

5. Next deployment operation

The next operation with Castor should be Line 2 deployment, in July.

6. Next connexion operation

The next connexion operation probably supposes the DP system to be validated, and a firm programme of Victor to be delivered by IFREMER. There is a meeting with IFREMER planned on 6th June and the following message exchange will be discussed.

In summary, the exchange of Emails amounts to the fact that IFREMER is now planning its operations for the second half of this year and for the next. They may have to operate at the Antilles between November 2006 and April 2007. They would therefore propose the use of VICTOR for ANTARES between September and October. Since however VICTOR is now at Brest, someone should pay for its transportation between Brest and Toulon and back.

The estimated cost is about 50kEuro. Jean has pointed out to them that ANTARES will need the ROV between December 2006-January 2007. The answer is that this might be possible if someone covers the cost of transportation of VICTOR to the Antilles at the end of the December-January operation. Estimated cost: 70kEuro. Jean shall try to see if part of these costs may be taken over by IFREMER.

Follows a long discussion concerning the opportunity of the two separate operations (September and December, respectively for the connection of line 2 and for that of line 3 (or line3 + line4). The cost of the two operations is in the range 400k-500k Euros, to which one has to add about 50kEuros for the transportation costs mentioned above (under the assumption that a substantial fraction of the cost is covered by IFREMER). It is finally decided to ask Jean and John to explore with IFREMER the possibility of the two separate operations. It is pointed out that, should this be feasible, the first operation should take place at the earliest possible moment in September, and the second at the latest possible moment (end December) in order to allow having results of the connection of line2 before installing line 3 (or 3+4). In view of the possible availability of Nautilus on the Antares site in July, the September operation might be unnecessary, while the one around November-December remains very important.

7) Antares MoU (Vincenzo Flaminio)

Antares Common Fund in new MoU

- Problems in applying proposal of “proportionality”:

- a) great degree of arbitrariness in definition of “members”
(Engineers, PhD students, part-time members...)*
- b) varying composition → changes in year-to-year contribution*
- c) great unbalance among contributions by different institutions*
- d) Institutions already contributing more in terms of
salaries + travel for shifts charged in addition for increased
common fund contribution*
- e) original MoU signed on basis of fixed percentages*

Antares Common Fund in new MoU

John Carr, May 11:

The experience of the last month is that we have not succeeded in deciding on the list of names, either in types of people or in which people. I hope nobody thinks we should be calculating 2007 CF sharing using names, some of whom retired in 2004.

.....

I think a fixed number scheme is well defined and defensible.

Antares Common Fund in new MoU

Budget limitations of Institutions not compatible with increasing CF contributions.

e.g. INFN contribution in 2006 = 135 kEuro → difficult to increase in forthcoming years.

Assuming it constant in 2007, total CF will be:

if 19%.....710 kEuro

if 20%.....675 kEuro

if 21%.....642 kEuro

if 22%.....613 kEuro

if 24%.....562 kEuro

Antares Common Fund in new MoU



Find solution that satisfies “formally” request

John’s proposals tend to go in this direction

BUT

Last proposal contains increasing “ceiling” leading to increasing percentages ← not acceptable

Antares Common Fund in new MoU

Solution that satisfies “formally” request

Alternative proposal:

Take John’s proposal of May 12:

INFN, IN2P3	21%
CEA	18%
FOM,BMBF	15%
Valencia	4%
Mulhouse, INSU	3%

With figure in the MOU as 700K (rather than 725K) + 25k from IFREMER

Propose this to FRB.

OR

Modify list of names in MoU, in such a way as to obtain above result !!

At the end of the discussion it is clear that there is agreement on the new MoU, while no agreement is reached on the sharing of the common fund. A new proposal has been made in the days immediately following the meeting of the SC. This will be circulated among the members of the CF committee in the coming days, to be later discussed by the IB.

8) Quality control (Stefano Cecchini)

- The General Register of NCR has been updated (11/05) in the QUA web pages
- Since the last SC (Erlangen,10/04) 3 MAJOR NCRs have been added, and 19 minor (however several of them were open before the date but not received by me. They concern:

1- The LOB on the MILOM

There has been a long exchange of mails among JJH, TG/AG and DR (with others in CC) on the situation of the LOB container (drawings and specifications for tightening the screw container). The situation for me is still not clear and a final decision has to be taken for the next integration (a new TN=5ASS-02-70A has been produced but still with the old specifications) continuing discussion with Nautilus firm.

Apparently it is very difficult that the recovery of the MILOM container will allow a clarifying inspection, as the overpressure will probably destroy the container (JPS).

2- Leak found in a LCM cylinder

Water has been found inside a module after a test at CPPM indicated possible leak. The end cap has been dismantled, the chamfers re-machined and the cylinder will be reprocessed.

(a minor one also concerns an end cup returned to CPPM for gap control; the connector no.1 was found faulty – reprocessing)

3- Non operating IL-IC05 (1.4.1.1/1.0005)

Its use has revealed a problem when trying to operate with different connectors of the JB (8,12,13). Actions have been decided (expertise by ODI and definition of procedures for connections to JB and BSS)

The content of these NCRs is scheduled for discussion at present SC.

- 21 minor NCRs have been also opened and 11 of them already closed.
 - I have not received any news from the task-force studying the problem of the missed Line_0 release.
 - The IL cable that was shipped back to ODI (not conform for tight bend in shipment) has been received by Catania with all the documents (CeCo).
 - An issue that probably will find its solution in the discussion at present SC regards the TMC2 in SCM (it was tentatively suggested to introduce a DCR)
 - There has been an exchange of mails regarding the CA/PA and CeCo for the delivery of the repaired SPM (NCR-CPPM-2006-0069; 09/11/2005); there is a problem as the reason of the failure has not been found. Anyway the NCR can be considered closed and extreme caution is to be taken in its use and in recording the history of operations with it (the repair is very expensive)
 - Still waiting from AGalic the confirmation for the Audit training
-

9) Planning (J.P. Schuller)

Evolution (of delays) between April and May 2006

- + 2 months xCM INTEGRATION line 3-12
- + 0.5 month LED BEACON line 4-12
- 0.5 month EMC line 3-12
- + 1 month (?) LCM / MLCM-BACK line 6-12
- + 0.5 month COMPASS CARD line 7-12
- +1 month CEA TOOLS & TEST BENCH

Line 2 is expected to be ready in July.

Jean Pierre has also shown a schedule of line installations and connections, but, in view of the large uncertainties associated with availability of IFREMER, this has to be reconsidered after the forthcoming meeting with IFREMER.

10) Detector Operations (Paschal Coyle)

Operations steering report 14/5/06

Power Hut

Rat infestation dealt with. Holes blocked and ultrasonic repeller installed-may not be sufficient.

Junction Box

One output breaker tripped

Detector

Weekly optical margin measurements, show 13dB loss in sector III-TX.

Lost OM2-floor 22

OM2 floor 16 intermittent?

Rates still high most of the time.

10MBit link to outside world operational.

Castor PC died-replacement needed.

J.P. Ernewein has provided nice tools for plotting the slow control data (ADCP, HV, humidity, temps) in monitored values.
Clearly lots of missing data-corrupted data+parser not running.

Stability of daq improved somewhat using larger frametime.

Attempts to implement highrateveto for allsampling>1 so far not successful.

Pending Issues

Corrupted root files for some autoruns.
Implement k40 trigger.
Highrate veto can be active when allsampling>1.
Understand offshore L1 trigger in lab.

Acoustic parsing to be implemented.
Configure HV correctly from state ?idle?.
Why is the humidity data missing?
Test laser beacon configuration via run control.

Large variation in baselines rates between OMs-are we sure the thresholds are correct?

Jean Pierre Schuller points out that the readout of storey 16 goes crazy at times, both for the compass/tiltmeter and the HV. Found that the HV read on OM2 of this storey, which is normally 1800 V, gives 2500 V when OM2 is not working. He also points out that 13dB loss mentioned above may be related to water-blocking connectors. These have not been modified in line1, the only changes having concerned the non-water-blocking connectors.

The question is discussed if additional optical amplifiers should be purchased. Since the ones previously used for the MILOM are now available, it has been decided not to buy new ones for the time being.

The threshold values are an additional pending item.

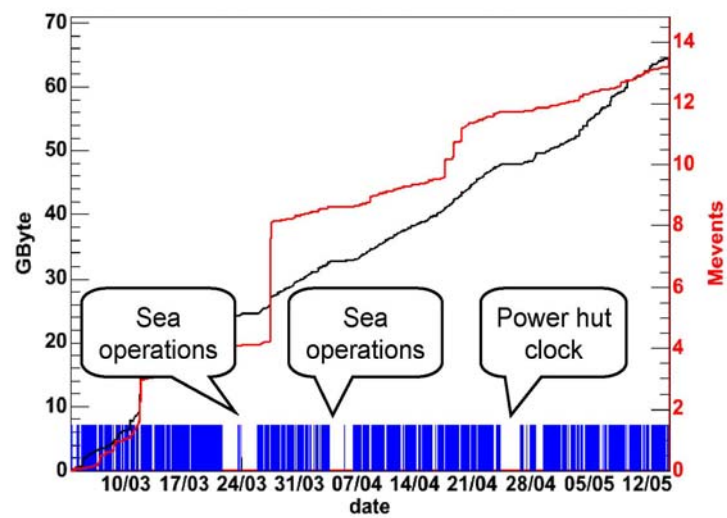
It is decided that Wednesday meetings can take place from now on via VRVS. A PC has been setup at IMP for this purpose.

Follows a long discussion concerning the data taking plan. It is finally decided that, as long as the rate measured by the MILOM stays above 500 kHz, the HV on line1 will be turned off. The MILOM will be used as a monitor of bioluminescence, avoiding the risk of damaging the 75 PMT of line1 due to high PMT current.

11) Readout (Maarten deJong)

Readout



15-16 May 2006



Things to consider

- PMT HV off @ high bioluminescence activity
- Rate measurements
 - use CRM data

Hardware

- Off-shore
 - ARS
 - FPGA
 - LCM_DAQ/SC
 - DWDM
 - stable
 - PMT?
 - fibres?
- On shore
 - DWDM
 - Ethernet switch
 - PC farm
 - User PCs
 - Clock
 - Link 2→10 Mb/s (Juergen)
 - stable

1 broken (not serious)
1 repair

Software

- Slow control
 - SchHarness
 - not (yet) stable
 - HV read & set?
 - reading tilt meter not thread save
 - requires 2 *consecutive* commands
 - Database
 - Prepare for 12 lines

Software (II)

- Slow control
 - Parsing
 - ADCP exist
 - Acoustic being implemented
 - Compass improve stability
 - Process Lyon
 - Responsibility Diego → Jean-Michel

Software (III)

- DaqHarness
 - not (yet) stable
 - zero-copy not (yet) operational
 - VxWorks T2.2 bug
 - removal of 'dirty trick'
- dfilter
 - stable
 - sometimes corrupted data from DaqHarness → ~understood
- DataWriter
 - very stable
- Run control
 - stable
 - implemented Laser beacon configuration

Software (IV)

- Infra (boot monitor)
 - very stable
 - not green → reboot
 - OK for 12 detector strings

Line 1

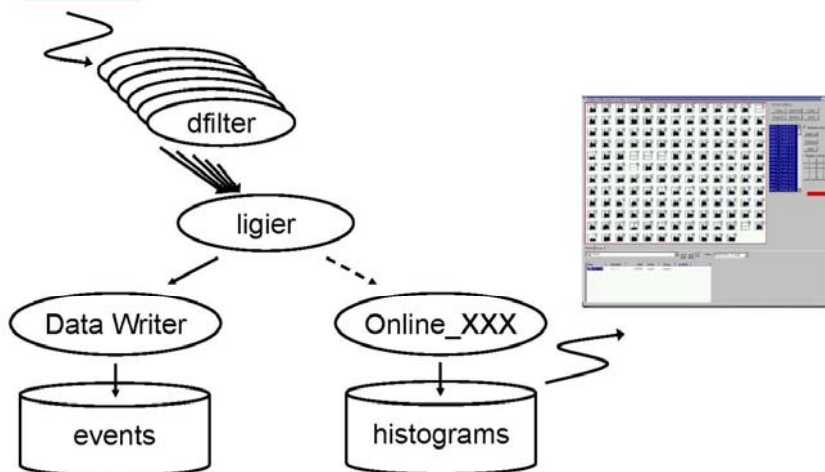
FLR 00	FLR 01	FLR 02	FLR 03	FLR 04	FLR 05	FLR 06	FLR 07	FLR 08	FLR 09	FLR 10	FLR 11	FLR 12
FLR 13	FLR 14	FLR 15	FLR 16	FLR 17	FLR 18	FLR 19	FLR 20	FLR 21	FLR 22	FLR 23	FLR 24	FLR 25

MILOM

FLR 00	FLR 01	FLR 02	FLR 03									



Online Monitoring



Online Monitoring (II)

- Online_XXX
 - operate in background
 - Physics events
 - Time slice data
- Histogram presenter
 - automatic update of display operational
- Responsibility
 - Claudine Colnard → Guus Wijnkers

Online Monitoring (III)

- 'open'
 - everybody can contribute!
 - final responsibility
 - shore station mjpg
 - Lyon Juergen, ...

Plans

- User PC
 - 3 additional desktop PCs ordered
 - delivery several weeks (not urgent)
- Ethernet switch
 - order 5 additional modules (24 ports) before summer
- PC Farm
 - order ~10 additional PCs before summer
 - 64 bit processor? Tests @ NIKHEF coming month

Plans (II)

- DaqHarness/ScHarness
 - improve stability
- Run-control
 - check (automatic) run start
 - simplify hand-shaking MasterClock?
 - regular system check
 - automatic reboot?
- dfilter
 - integration of ligier being prepared
 - Minimum bias trigger
 - increase ΔT
 - K40 trigger
 - use raw data (1 full clock cycle)
 - input from PAW
 - estimate total CPU power

Plans (III)

- Clock
 - GPS time @ every start of run in database?!
- Online monitoring
 - Histogram presenter
 - user control of automatic update
 - Histogram commands
 - save histograms to file
 - reset histograms
 - modify update frequency
 - ?
- Automatic backup
 - GUI

Things to remember

- Avoid noise hits in 'other' LED beacons
 - disable corresponding ARSs
- Alignment based on fixed values
 - no dynamic line shape correction
- Inter-line calibration (Line_1 → Line_2, etc.)
 - global time-offset 'easy'
- The L2-trigger (TDR) would not work with 12 strings
 - $300 \times \text{L1 rate} \times \Delta T \gg 1$

Things to consider

- PMT HV off @ high bioluminescence activity
- Rate measurements
 - use CRM data

*It has been pointed out during the discussion that one should not use the CRM, as stated by Maarten, but the L0 counter.
The ⁴⁰K Trigger has to be urgently implemented.*

12) Calibration (Juanjo Hernandez)

Positioning (I)

Acoustic positioning (Vincent B, Gabrielle L)

- Parsing code of acoustic raw data is now ready. Currently being included into the general parsing by D. Real
- Comparison of sound velocity measurement from the 3 available probes (2 SV + 1 CT) done, sound velocity variations are now taken into account to calculate the acoustic distances.
- Hydrophone positions obtained by triangulation after first cleaning of acoustic measurements, "pure acoustic" line shapes and movement in horizontal plane obtained for various water current speed conditions
- Ascii files with hydrophone positions sent to Erlangen for inclusion into alignment procedure
- Next steps:
 - Filter the data :The Rx 11, well working, will be used to define the average period. Averaging for a better corresponding period should enable to filter distances.
 - Improve the continuity of data taking : Online histogramming for shifters.
 - Interface the database
 - Deployment of another transponder (for a better precision on y)

Positioning (II)

Analysis of tiltmeter/compass data (Jürgen H)

- Bx, By *in-situ* calibration performed
- Zenith and azimuth angles show expected behaviour w.r.t. correlation with sea current (agreement implies good pitch/roll calibration)
- Shape of line shows expected parabolic behaviour
- Orientation (heading of OMs) of storey not predictable from neighbouring storey → loss in performance using the standard reconstruction procedures (efficiency down by 30% and angular resolution from 0.4° to 0.6°)
- Data with all tiltmeters read is scarce (in ~1.5 months: 5 min → 36 times, 10' → 41, 20' → 158, 30' → 239, 60' → 384). Being studied, diversity of origins (6 min request, periods without data, synchronization problem, a few TCM2s with less response)

Overall Alignment and Line shape (Holger M + Jürgen H)

- The alignment software is interfaced to the database, the program reads the geometry and the tiltmeter/compass data from the database (the acoustic triangulation is read at the moment from ASCII files, but ready to read from DB too)
- Since work is still in "testing phase" results are not yet written into the DB. shape of line shows expected parabolic behaviour
- Scarcity of data with all tiltmeters read prevents good results, but the fit seems to work

Calibration in the labs

CPPM Dark Room (Jose B + Guillaume L + Stephanie E)

- Problems with LCM_ref fixed (traced back to a faulty DAQ board).
- Optical beacons successfully pre-integrated (GL)
- CPPM ready to start calibration

CPPM Dark Room (Bertrand V + Pascal V)

- Ethernet interface problem now fixed, DAQ working. Successful fake runs under RunControl made
- CLOCK process within RunControl responds properly to requests
- Progressing slowly towards fully operational status
- Next week: calibration of laser light with small PMT sent from CPPM

Meeting in Valencia (JB,BV,GL,SE,JJH,JZ,FS,JAA)

- Improvements in LOB calibration: fibre swapping, off-set conventions, walk correction, direct light?
- Discussion on pre-integration (problems, new GUI)
- Container screwing problems

ARS Calibration (I)

AVC (Felix F + Antoine K + AA, SA, CD, SL, BV)

- New set of values from in situ measurements stored in the DB
(pedestal runs → pedestals , min bias triggered events → single photo-electron peak)
 - **IPE**: Usual method, i.e. fit of exponential + gaussian to integrated distribution (x_0, x_1, σ).
 - Values (RMS) for all ARS: $x_0 = 61(18)$, $x_1 = 67(15)$, $\sigma = 2.8(0.8)$
 - Wide spread of x_0, x_1 but random in the position of the ARSs.
 - Small differences in-situ – DR: $\Delta x_0 = 0.3(7)$, $\Delta x_1 = 1.5(1.2)$, $\Delta \sigma = -0.02(0.5)$
 - **PED**: L0_th=255 runs. Gaussian fit to integrated distribution and plateau.
 - ped= 56 (15) , $\sigma = 1.4(0.7)$
 - Compatible with DR: $\Delta \text{ped} = 0.9(1.1)$, $\Delta \sigma = 2.5(0.9)$
- X-talk analysis done. Parameter stored is XT_range (AVC change in TVC range). Distribution of XT_range: mean=2.8 channels, RMS=1.8, max= 8 channels (~1 pe!)
- Recommendation: 1 pedestal run of 1 hour per week
- Dynamic range: up to 20 pe's
- Documentation (methos + CalibFW) in preparation

ARS Calibration (II)

AVC (Antoine K + Felix F)

- Future Plans:
 - check linearity of AVC response over full range (with waveforms)
 - Use of cross talk correction (ready but does anyone from the analysis team use it?)
 - single ARS/OM measurements (for the moment we have release calibration values for the full line 1, but some few ARS should be individually revised.). This is related to the faulty flag question.
 - tuning of setting to adjust all ARS to comparable response (now the dynamical range is quite different from chip to chip)

ARS Calibration (III)

Gain and Thresholds (Sotiris L + ...)

- All OM and PM performance parameters have been entered into the Dbase.
- Gain and threshold plans:
 - Check gains and thresholds in WFI: Line 1 and Milom).
 - Check AVC gain from the WFI peak and AVC-WFA correlation curve.
 - Read AVC pedestals, check gains and thresholds in AVC.
 - Compare tunings with results, compare with LCM integration results.
 - Give recommendations for new .5 and .33 p.e. tunings.
 - Check using Dt exponential spectrum method.
 - Check efficiencies from muon reconstruction. Underway (with YB, TS).
- Gain and threshold status:
 - 68 ARSs of 12 LCMs have been analysed. 34 have a more or less clear WFI p.e. peak and threshold. So the method works.
 - The WFI using peak search (P. Payre method implemented by A. Kouchner) works. The profile histograms AVC-WFI show a good correlation, the line at 1 p.e. goes (often...) through WFI=0. Below $\sim .5$ p.e. the correlation is lost

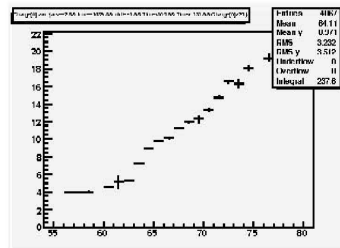
ARS Calibration (IIIa)

1. Gain and threshold checks detailed status

68 ARSs of 12 LCMs have been analysed. 34 have a more or less clear WFI p.e. peak and threshold. So the method works.

1.WF Integrals

The WFI using peak search (P. Payre method implemented by A. Kouchner) works. The profile histograms AVC-WFI show a good correlation, the line at 1 p.e. goes (often...) through WFI=0. Below $\sim .5$ p.e. the correlation is lost [Figure 1].



ARS Calibration (III b)

1.Pedestals

The AVC pedestals are being checked, using the pedestals stored into the Dbase (AK, FF), to see if the line goes through them. For 50 % of ARS it is satisfactory.

1.AVC p.e.

The p.e. peak in AVC (also stored in the Dbase, measured using the integration method by MdJ) is good for 148 out of the 150 ARSs. WFI are being checked for consistency (with AK, CP, BV). The correlation gives an important check of the p.e. peak and gains. Using the correlation line, we can predict a p.e. value in the AVC from the one in the WFI. For a subsample of the cases where the correlation gives a good fit, the difference between AVC p.e. and predicted AVC p.e. is small. This shows one can trust the p.e. peak gain.

Time calibration (I)

Clock (Guillaume L)

- Guillaume will be responsible for the clock “vis-à-vis” calibration. It is needed that the clock data be available in a more straightforward way to people working on calibration (new simplified table? availability of software?)

Internal LED (Maximilien M)

- Results are stable since connection (an error analysis yet to be done)
- Different times of the two ARSs of the same OM to be investigated
- Efficiency of LED signal in several OMs very low (one ARS with good statistics, the other with low stats).

Walk correction (Guillaume L)

- An internal note (ANTARES-Cali/2006-004) gives an expression for the walk based on the actual physical process.
- My view (JJH) is that we should carefully study if the effect is convoluted with the earliest photon effect (see below).

Time calibration (II)

Optical Beacons (Juanan A)

- Linear delay with distance being studied
 - Line stretching or wrong speed of light, very unlikely explanations
 - Related to charge.
 - Big for a walk effect, probably an “earliest photon effect” (affects DR calibration?)
- The missing OM-OM time differences comparison with ^{40}K done: sum of OM-OM time differences seems compatible with zero (error analysis not yet done)

Else...

Database (Arnauld A)

- A note on “Calibration data storage” is now available (ANTARES-Cali/2006-005 and updates in <http://antares.in2p3.fr/users/albert2/calibrationv2.3.pdf>)
- “Official flag” and DNLs issues addressed and solutions proposed.

Relationship with Operation

- ^{40}K studies need special runs (Niccolò Cottini tried but too few events): special trigger (Maarten dJ), off-shore trigger (Paschal C, very promising).
 - Relationship Operation-Calibration can improve (still difficult access to Wednesday meetings, direct relation “calibration user” – shifter, day to day operation too absorbing...).

Conclusions

Work in progress. . .

Some comments:

- Data is readily available, but steadiness of data taking can be improved in some areas (acoustics, tiltmeters).
- Communication between groups improving (acoustics → line shape ; tiltmeters ↔ SC ; Dark room ↔ Beacon assembly ; acoustics+DR → Beacon analysis), but needs to get yet better.
- Error analysis is missing in most analysis (statistical errors are small and ideas to estimate systematic errors are needed)
- Calibration relationship with Operation: mostly 1) standard calibration runs and 2) direct calling of “user” to shifter and 3) mails. Needs more virtual meetings.

13) Software (Jurgen Brunner)

Atmospheric Muons

New production finished (equivalent ~1 year for most bins)
covers full phase space down to threshold
Total 700 GBytes 10000 files Corsika level
About 1 Tbytes when adding all processing steps

After conversion to Root, file merging performed
10000 -> 300 files
After TrigEff about 35 Gbytes left
feasible to use full statistics for reco development
& analysis

internal note in preparation
presentations foreseen this week

New production used for all Line1 analyses
other improved features: correct event weights
overlay of line1 noise

future: plan for reprocessing to be defined
- per run for noise variation
- per current speed bin (?) for geometry definition

Line1 analyses

NIKHEF, CPPM, CEA pursue their efforts independently
(Erlangen: first steps)
at some point convergence on code conventions needed

- common I/O classes
- common analysis tools
- structures which can incorporate different reco strategies

Discussion on this subject will start this week

K40 simulation

Internal note on new simulation in preparation
New measurements with line 1 expected when rates go down
Threshold study needed to complete analysis

Database

Rather complete scheme on calibration tables presented
Includes now

- full acoustics table scheme
- TVC DNLs
- "Official flag" for selection

Future : provide interfaces to make use of the full power
of the present scheme

Quick upgrade to Oracle10 decided

- solves disk space problem at Lyon
(currently only 6GBytes are allocated to Antares)
- official request on 1 TByteslaunched
- discussion with CC-IN2P3 group planned in the near future

break up of big tables decided

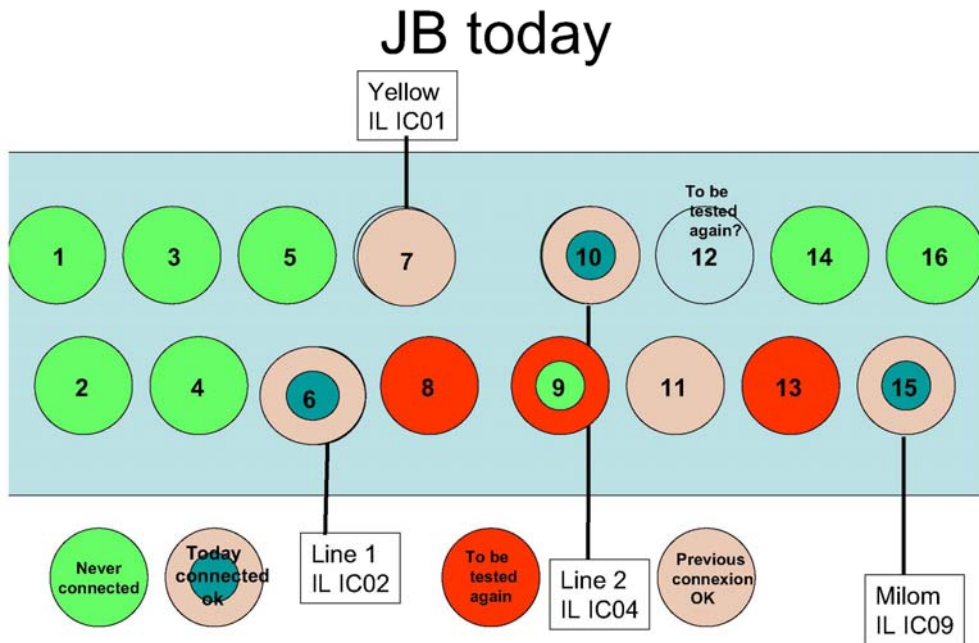
- MONITORED_VALUES will be cut into pieces according to PBS
-> significant access speed gain
- RAWDATA3 -> break up in time units (years)

14) Status of OD connectors on JB (Jean Roux)

See the long presentation, with all details and pictures of
the sea operations made to test the JB output connectors,
by Jean Roux on the WEB site:

<http://indico.cern.ch/getFile.py/access?subContId=0&contribId=6&resId=0&materialId=slides&confId=1155>

The situation of the JB connectors has been described in detail. It is shown in the following figure:



Apparently, out of the 16 connectors, one (nr 6) is used for the Line1, one (nr 15) is used for the Milom, one (nr 10) is ready for Line 2, three (8, 12 and 13) are not working. Two of these (nr 8 and nr 13) are to be tested again. IL IC01 is connected to connector nr 7.

15) Situation of spares for JB (Paschal Coyle)

Junction box spares inventory May 12, 2006 (1 of 3)				
Item	Status	# reqd	# stock	next operations
A,B cards				
PCBs	2: loaded with FPGAs & optical serializers	2	2	
laser diodes (narrow bandwidth)		2	2	
pin diodes type 1		2	2	
pin diodes type 2 (power off)		2	0	order (~200€)
small components and connectors	Short del		0	1 000 €
Lambda 5V 30W P/S (B card)		1	1	
Vicor 5V P/S (A card)		1	0	order (800€)
C card				
PCBs	1: loaded with u-controller	1	1	
laser diodes (type 2 low power)		1	1	
pin diodes type 2		1	1	
small components and connectors	Short del		0	500 €
3.6V lithium battery pack	Short del		0	300 €
Relay card				
PCB	unloaded	1	1	
Relays	Short del	70	36	order+load (400€)
small components and connectors	Short del		0	500 €

Junction box spares inventory May 12, 2006 (2 of 3)				
Item	Status	# reqd	# stock	next operations
Connection card				
PCB	unloaded			
ADCs		4	0	order+load (200 €)
analog multiplexers		4	0	order+load (200 €)
Signal transformers; 240V secondaries		2	0	order (100 €)
small components and connectors	Short del		0	500 €
Sensors				
TCM2		1	0	order (1000 €)
Humidity sensor	Short del?	2	0	order (100 €)
NTC thermistors	Short del	24	0	order (200 €)
PTC80 thermistors	Short del	24	0	order (100 €)
PTC100 thermistors	Short del	24	0	order (100 €)
MACCs		17	22	
MACC PCBs	fully loaded except RF screen	17	20	
MACC Lambda 5V 30W P/S		1	0	order (800 €)
MACC Lambda +/- 15V 30W P/S		1	2	
Moller Output breakers				
Thermal block		18	17	
remote control		18	17	
Base		18	17	
remote monitor		18	17	
Junction box spares inventory May 12, 2006 (3 of 3)				
Item	Status	# reqd	# stock	next operations
Connectors (external)				
ODI Mk2 electro-optical jumpers or better	Buy whole set or not OR OTHER?	18	0	?
SeaCon test connector		1	0	?
SeaCon 3pin sea electrode connector		1	0	?
Seacon Pre-JB flange 48 fibre E/O		1	0	?
Connectors (internal)				
HSC 21 pin circular feedthrough		10	0	order (3000 €)
21pin circular mating connector		10	0	order (1000 €)
Coaxial cables+ connectors		120	0	2 000 €
Isoelectric Hv feedthrough		2	2	
Teflon caps for HV feedthroughs		2	0	make
Sea Electrode				
		1	1	
Transformer (1*5000V/(16*500+2*250V))				
	dossier with RAE; waiting quote	1	0	order (8000 €?)
Transformer support frame (st. steel)	old prob won't fit new transfo	1	0	make
Aerogel interhemisphere thermal insulation				
		1	1	

Approximate total cost components to buy (except external connectors) = 21000€

Follows a long discussion regarding the possibility of recovering the JB for repairs. It is suggested that a simpler solution may be that of “duplicating” some JB output connectors. This is electrically feasible, but the possibility of using additional colors for

the fibre transmission has to be explored. Nikhef will analyse this solution, possibly before the next SC meeting.

For tests of additional output connectors on the JB, it will probably be possible to use the IL cable now connected to JB output nr 7.

16) Options (Jean Pierre Schuller)

Status

- ❖ 2 connectors used (6 & 12)
- ❖ 1 connector ready (10)
IL (IC04) installed, tested
- ❖ 1 used recently (7)
- ❖ 1 tested previously (11)
with IL IC05

**→ Can connect at least up to
Line4**

Summary of last operation

4 connectors tried (8, 10, 12 & 13)

- ❖ 1 OK (10)
 - ❖ 3 bad:
 - 1 already known (8)
 - 2 new (12 & 13)
- BUT** IL (IC05) fails at some time

Pessimistic view: 4 attempts, 3 failures

Optimistic view: 1 attempt in good conditions, 1 success

Recovery of the JB?

❖ For what?

Repairs

Full status needed: VICTOR as soon as possible!

"Many" bad connectors: Must be recovered

Next question is when?

It depends of the number of failures!

"Few" bad connectors: Start to think:

Duplication of connectors: secondary JB (1 → 2)

→ Electrically: OK

→ Optically: need more colours

Recovery of the JB?

❖ For what?

Maintenance

*Except if problems, must be done as late as possible
(to avoid multiplying such operation)*

Improvements

Definitely not sufficient to justify a recovery!

When?

1. Now (i.e. in the coming months)
 - Pro: only 2 lines connected
 - Contra: catastrophic for the future (?) of Antares
2. Next year (i.e. after few months of operation with 4 or 5 lines)
 - Pro: politically less dangerous & still not too difficult
 - Contra: pause whilst we are in full production
3. 2008(9) (i.e. after operating full detector for a significant period)
 - Pro: looks like a normal behaviour
 - Contra: very complicated (& risky)

What about the needed time ?

Related topics (IL):

What is wrong with IL-IC05 ?

Waiting for ODI answer

Do we have damaged connectors 12, 13 ?

What do we do with cables stored since about 2 years ?

5.0 Storage

5.1 Short-Term Storage (up to 1 year)

The connectors should be stored in clean, dry conditions and protected from exposure to sources of UV or ozone. Preferably, they should remain in their original shipping containers.

5.2 Long-Term Storage (connectors stored for more than 1 year)

The same storage conditions should be observed as specified in 5.1 above. Additionally, if the connectors remain unused after 2 years of storage, it is strongly recommended that they be returned to Ocean Design for evaluation. If in doubt, contact Ocean Design for further information and guidance.

→ Question to ODI

17) Evaluation of Sea operations for JB recovery (Jean Roux)

This operation have been described in the cctp of the call for marine operation contract:

1.1.1 OP3 : Opération de récupération de la BJ pour maintenance

Cette opération suppose, au préalable, qu’au cours d’une opération distincte avec un engin sous-marin, chaque câble d’interconnexion ait été déconnecté de la BJ.

L’opération consiste à draguer, au moyen d’un grappin type « Deniels » et d’un treuil grand fond l’extrémité de la queue de dragage. Ce dragage (Annexe 6), est effectué entre deux manilles distantes de 20m et sous contrôle de la base longue ANTARES (balises positionnant le grappin, la BJ et le lest).

La BJ est ensuite relevée, le grappin est mis à bord, la queue de dragage est enroulée à la suite du câble grand fond et la BJ est enfin mise à bord.

Le connecteur d’extrémité de câble est déconnecté de la BJ et le bouchon bouclant est installé.

Le câble, le bouchon bouclant et la queue de dragage sont ensuite reposés sous contrôle de la base longue et le lest est largué. Le système de largage redondant est fourni par le CPPM.

La BJ est ramenée à terre pour réparation.

1.1.2 OP4 : Opération de pose de la BJ après maintenance

L’opération consiste à draguer, au moyen d’un grappin type « Deniels » et d’un treuil grand fond l’extrémité de la queue de dragage. Ce dragage, est effectué entre deux manilles distantes de 20m et sous contrôle de la base longue ANTARES (balises positionnant le grappin, le bouchon bouclant et le lest).

Le bouchon bouclant est ensuite relevé, le grappin est mis à bord, la queue de dragage est enroulée à la suite du câble grand fond et le bouchon bouclant est enfin mis à bord.

Le connecteur d’extrémité de câble est déconnecté du bouchon bouclant et connecté sur la BJ.

Le câble, la BJ et la queue de dragage sont ensuite reposés sous contrôle de la base longue et le lest est largué. Le système de largage redondant est fourni par le CPPM.

Suite à cette opération, au cours d’une opération distincte avec un engin sous-marin, chaque câble d’interconnexion est reconnecté sur la BJ.

The recoveries of BSS deadweights which have been successful make us confident in our capability to take the JB on deck without problem, in terms of ship and navigation capabilities.

I consider that a recovery/maintenance plan of the JB have to be prepared and approved, **but** should not be executed unless there is no alternative solution. The recovery and the deployment operation will be a “stress” for the JB itself as well as for the MEOC and the

drag tail (which should be replaced by a 20m chain because I have no confidence in the cable layed on sea bed since several years).

In terms of costs the evaluation is roughly 250 000E

- Victor operation for JB outputs disconnections*: 200 000
- Castor 1 day operation for recovery + mob : 25 000
- Castor 1 day operation for deployment ** : 12 500

Note*: The Victor operation for JB output connections is included in the connections of new lines deployed during the JB maintenance period

** the mob is included in the deployment of a new line at the end of the JB maintenance period

18) Decisions on TCM2 (Robert Lahmann)

```
*****
*           The Compass Board in the SCM           *
*****
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Description of the Compass Board
=====

The Compass board (CB) consists of the Motherboard and (optional) of a piggy-backed Daughter board called TCM-board (current version is 2.0)

In xLCMs, the Compass board is required because the HV of the PMTs is controlled through the CB (for this task, no TCM is needed).

In the SCM, the CB is not required (no PMTs with HV present), but it can be used for positioning and/or monitoring on the conditions inside the SCM.

Instrumentation on the CB motherboard and TCM daughter board:

Motherboard: Humidity sensor and Temperature sensor;

TCM board: Tiltmeter (2-dimensional) and 3 coils arranged in x,y, and z-direction for the measurement of the Earth magnetic field. From the measurement of the Earth magnetic field the heading of the storey can be reconstructed. (Heading: clockwise rotation of a storey around the local vector of the Earth's graviational field, with 0 degrees heading corresponding to the North direction.)

Options for Installation
=====

1) CB Motherboard only
+++++

The "added value" in this case is a humidity measurement inside the SCM.

Temperature measurements are made by several other boards and therefore the measurement of the temperature on the CB by itself only adds redundancy.

2) TCM2 board installed

+++++

An absolute positioning of the BSS is crucial and in theory the TCMs could be used for exactly that. There are some complications however:

i) Measurements of the tilts:

a tilt of 1° implies a lateral displacement of around 6 cm at the end of the mast where the transducer is installed. This number has to be compared with the expected accuracy of the positioning of the BSS itself by the LFLBL system:

1 m (as quoted in the TDR).

The sea bed at the Antares site is pretty flat, but one can not exclude tilts of 2 or 3 degrees.

ii) Measurements of the rotation:

If this measurement is missing, it means that we just know that the transducer is somewhere on a circle centred on the BSS axis. From the geometry of the BSS, this circle is about 1 m in radius.
Not acceptable.

Then we have a problem: the value given by the compass is biased because of the large amount of metallic material of the ensemble BSS/dead weight (as an example, the measured magnetic field in the SCM of the MILOM is 36 uT instead of the expected 46 uT). To make sense, a calibration is needed. A calibration has been tried in the past for the PSL and the MIL, but it is quite a delicate procedure which has to be performed at Foselev with the full line after the final integration of the BSS. Such a calibration is not done anymore. It would require a Slow Control reading of the line at Foselev and a cooling system which is far beyond the current Line tests at Foselev. For MILOM and Linel, the BSS orientation can be obtained from the VICTOR heading information during the connection phase with an accuracy of a few degrees. The simplest solution (and probably the best one) is to ask for a survey by the Victor by the time of the connection. Hence for this part the TCM2 is not needed.

It is finally decided to equip lines 4,5,6 with the new TCM2.5. Erlangen has volunteered to contribute with 15kEuro. The total amount of money needed is 88,900 Euros. Nikhef will anticipate the rest of the money.

19) AoB

It has been decided that some of the SC meetings may take place via videoconference.

After the next SC meeting (to be held in Bari on June 26 and 27) the following meetings will take place:

<i>August 24-25</i>	<i>CPPM</i>
<i>October 19-20</i>	<i>VideoConference</i>
<i>November 16-17</i>	<i>VideoConference</i>

Summary of decisions

Line integration

Integration of Line 2 split between Saclay and CPPM. Integration at CPPM (bottom 3 Storeys) started a couple of weeks ago. Integration at Saclay (the two top storeys) will start this week (May 17). Bari has to send urgently the missing SCMs and MLCMs.

Integration of line 3 might start in Saclay around mid July. It might be ready in October.

Integration of line 4 may start at CPPM early in September, to be completed by the beginning of November.

Sea operations

The 3000m deep sea cable has to be replaced. A new one has been ordered and should be delivered within 8/10 weeks from the 10th of May. The cost is close to 16000 Euros.

Should the cable not be available for deployment of line 2, a cable will be obtained on loan from IFREMER.

Agreement has been obtained with Foselev which is going to install on Castor a fresh water cleaning system in order to remove salt during cable recovery operations to minimize corrosion.

For the installation/connection of the new lines, two options are open, depending on the schedule of IFREMER:

- 1) Installation and connection of line 2 around the end of July, if Nautilus will be operating around the Antares site at that time. Under this hypothesis, installation and connection of lines 3 and 4 might take place around November-December (under the further condition that the ROV will be available at that time).
- 2) Installation of line 2 in July, but connection around September (if ROV available). Installation and connection of line 3 (or 3+4) around December.

These options will have to be rediscussed after the meeting with IFREMER, to take place around June 5.

BSS release

Preliminary studies of the release problem by two IFREMER experts seem to indicate that a blocking may occur (under unfavorable conditions) at a much smaller angle ($1^{\circ}7$) than originally thought (17°).

New MoU and Common Fund

The new MoU is ready and they is now agreement on all points. However an agreement is still to be reached on the sharing of the Common Fund. A new proposal has been made in the days immediately following the meeting of the SC. This will be circulated among the members of the CF committee in the coming days, to be later discussed by the IB.

Detector operation

The question is discussed if additional optical amplifiers should be purchased. Since the ones previously used for the MILOM are now available, it has been decided not to buy new ones for the time being.

The threshold values have to be understood.

It is decided that Wednesday meetings can take place from now on via VRVS. A PC has been setup at IMP for this purpose.

Concerning the data taking plan it is decided that, as long as the rate measured by the MILOM stays above 500 kHz, the HV on line1 will be turned off. The MILOM will be used as a monitor of bioluminescence, avoiding the risk of damaging the 75 PMT of line1 due to high PMT current.

Readout

For the counting rate it has been pointed out during the discussion that one should not use the CRM, but the L0 counter.

The ^{40}K Trigger has to be urgently implemented.

JB and JB spares

At least 3 JB output channels (8, 12, 13) are not working. Possibility of recovering the JB for repairs: it is suggested that a simpler solution may be that of "duplicating" some JB output connectors. This is electrically feasible, but the possibility of using additional colors for the fibre transmission has to be explored. Nikhef will analyse this solution, possibly before the next SC meeting.

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