CONTRACT
between the ESRF and CRG/SNBL
concerning the operation of the beamline BM01
at the ESRF

The European Synchrotron Radiation Facility, hereinafter referred to as the ESRF,
Société Civile subject to French law,
located at 6, rue Jules HOROWITZ, B.P. 220, F-38043 GRENOBLE CEDEX,

represented by Mr. William G. STIRLING, Director General,
and Mr. Helmut KRECH, Director of Administration,

on the one hand,

and

the "Swiss Steering Committee for the Swiss-Norwegian Beam Lines at Grenoble, France",
located at Paul Scherrer Institute, CH 5232 Villigen, Switzerland,
represented by Mr. Gervais CHAPUIS,

and

the Norwegian Synchrotron Research AS,
located at Stensberggata 26, PO Box 2700, St. Hanshagen, N 0131 Oslo, Norway,
represented by Mr. Tore AMUNDSEN,

hereinafter collectively referred to as the CRG, and being jointly and severally responsible for the execution of this contract,

on the other hand,

collectively referred to as *the Parties*

HAVE AGREED UPON THE FOLLOWING PROVISIONS :

PREAMBLE

The contract hereunder is an update of the initial contract on the operation of the Swiss Norwegian CRG Beamline (SNBL) of Dec. 1994, which had been amended several times in order to extend its initial duration and, in particular, to set the conditions for accomodating the CRG at the ESRF.

Annex 1 ("General Conditions for beam lines established at the ESRF by Collaborating Research Groups") and Annex 2 ("Regulations for Cost Refunding by the CRGs") attached hereto are also updates of the orginal annexes, based on reviews of these regulations, consultations with the CRGs accredited at the ESRF and the final approval by the ESRF Council in June 2005.

The contract hereunder fully replaces the contract of 1994 and its annexes.

ARTICLE 1
Scope of the contract

1.1 This contract regulates the specific responsibilities and obligations of the ESRF and of the CRG in relation to the operation and maintenance of the beamline located on BM01.

1.2 This contract only refers to the beamline mentioned in § 1.1. Operation of other beamlines will be governed by separate contracts.

1.3 The general obligations of the Parties to this contract on organisational, managerial and financial matters are set out in the document *"General Conditions for Beamlines established at the ESRF by Collaborating Research Groups" (attached as Annex 1 to this contract),* hereinafter referred to as "General Conditions" which were approved by the ESRF Council at its meeting on 28-29 November 1994 and amended at its 43rd meeting on 13 June 2005. This document is to be regarded as an integral part of this contract and is thereby implicitly accepted by the Parties.

ARTICLE 2
Basic documents

2.1 The documents that govern this contract are as follows, in order of priority :

I. This contract.

II. Its annexes :
Annex 1 - General Conditions for Beamlines established at the ESRF by Collaborating Research Groups
Annex 2 - Regulations for Cost Refunding by Collaborating Research Groups, dated June 2005
Annex 3 - ESRF's Technical Annex, dated October 2000
Annex 4 - Beamline Technical Annex, dated January 1995

2.2 Each Party declares that it is cognisant of the documents cited in this contract and its annexes, that these documents are in its possession, that it has received all the necessary information for the execution of this contract, and that it is fully aware of the requirements imposed by the same.

ARTICLE 3
Location and layout of the beamline and the experimental stations

3.1 The CRG Beamline is located at position BM01. A plan specifying the area of the experimental hall available to the beamline is included in Annex 3 (ESRF's Technical Annex).

3.2 Information about the layout and the technical specifications of the part of the beamline from the storage ring to the shielding wall of the storage ring tunnel (beamline front end) is given in Annex 3 (ESRF's Technical Annex).

3.3 The layout and the technical specifications on the beamline outside the shielding wall of the storage ring tunnel as well as the instruments available to the general ESRF users as of the date of signature is described in Annex 4 (Beamline Technical Annex).

3.4 Any major change of the beamline is subject to a prior agreement in writing and signed by authorized representatives of the ESRF and the CRG.

T.A.
WGS

ARTICLE 4
Obligations of the ESRF

4.1 The general obligations of the ESRF are set out in Annex 1 (General Conditions).

4.2 At the request of the CRG, the ESRF provides optional services (cf. § 5.7 of Annex 1, General Conditions). A list of services is kept at the CRG Liaison office.

4.3 Services other than those specified in § 5.7 of Annex 1 (General Conditions) may be provided to the CRG on request subject to availabilitiy, under specific agreement.

ARTICLE 5
Obligations of the CRG

The general obligations of the CRG are set out in the General Conditions, in particular the CRG will reimburse the ESRF for any expense caused by its presence according to § 7.2 of Annex 1 (General Conditions) and Annex 2 (Regulations for Cost Refunding by CRGs) to this contract.

ARTICLE 6
Spokespersons

6.1 The spokespersons of the CRG as of the date of signature are Mr. Rafael ABELA and Mr. David NICHOLSON.
The local contact person of the CRG is Mr. Vladimir DMITRIEV, who will normally be present at the ESRF. The local contact is responsible for implementation of the safety rules.

The CRG reserves the right to change the spokesperson or the local contact after written notice to the ESRF.

6.2 The legal bodies on the CRG side in charge of handling financial matters vis-à-vis the ESRF, and represented on site by Mr. Vladimir DMITRIEV, are:

a) The Swiss Steering Committee for the Swiss Norwegian Beam Lines at Grenoble, represented by Mr. Gervais CHAPUIS,

b) The Norwegian Synchrotron Research AS, represented by Mr. Tore AMUNDSEN

6.3 Spokespersons for the ESRF in relation to the execution of this contract are :

a) for technical matters : the ESRF's CRG Liaison Engineer,
b) for administrative matters : the Director of Administration,
c) for scientific and organisational matters : the Directors of Research,
d) for safety matters : the Head of the Safety Group.

The ESRF reserves the right to change the spokespersons and their responsibilities after written notice to the CRG.

ARTICLE 7
Schedule

The beamline is operational since 1 January 1995.

ARTICLE 8
Conditions of operation

8.1 It is expected that the quality of the beam provided will meet the parameters as specified in Annex 3 (ESRF's Technical Annex). The amount of scheduled beam time during normal operation of the Facility is given in Article 12 of Annex 1 (General Conditions).

8.2 The CRG shall maintain the beamline in order to make available 1/3 of the scheduled beam time for experiments (as defined in § 12 of the General Annex 1, General Conditions) per semester to ESRF users.

8.3 The conditions for the visits of the CRG's users are regulated by Annex 1 (General Conditions), in particular § 7.10.

8.4 The Parties shall inform each other regularly, and at least every three months, on the technical performance of the beamline and, in particular, whether any modifications are necessary. Information will be exchanged by means of progress meetings or by written documents.

8.5 Operation of the CRG will be subject to the following review procedures :

- An annual review of the service performance, as a result of which corrective actions may be suggested for deficiencies. This will be conducted by the ESRF User Organization.

- A scientific review, with Science Advisory Committee involvement, shall take place at intervals of about five years of operation and again before any extension of this contract.

ARTICLE 9
Final provisions

9.1 This contract replaces the "Contract concerning the Operation of the Beam Line D1 at the ESRF", signed on 21 December 1994. It becomes effective at the date of signature.

9.2 The contract is valid until 31 December 2009. Each party reserves the right to terminate the contract by registered letter giving twelve months notice.

9.3 At the end of the period mentioned above, the contract may be extended subject to a prior agreement to be signed by the Parties.

9.4 Any amendment to this contract or its annexes shall be the subject of a supplementary written agreement. All documents relating to this contract shall be written in English.

For the Swiss Steering Committee, Mr. Gervais CHAPUIS

Date: 30/01/06 Signature:

For the Norwegian Synchrotron AS, Mr. Tore AMUNDSEN

Date: 8/2-06 Signature:

For the ESRF, Mr. William G. STIRLING

Date: 22/12/05 Signature: W.G. Stirling

Mr. Helmut KRECH

Date: 22.12.2005 Signature: H. Krech

Annex 1 to the Contract between the ESRF and CRG/SNBL concerning the operation of the beam line BM01 at the ESRF

GENERAL CONDITIONS

for beam lines established at the ESRF by Collaborating Research Groups (approved by the Council at its meeting on 28.-29. November 1994 and amended at its meeting on 13. June 2005)

PREAMBLE

The multigovernmental Convention concerning the construction and operation of the European Synchrotron Radiation Facility (ESRF), signed by representatives of the Contracting Parties on December 16, 1988 in Paris, covers the construction and operation of a facility with thirty beamlines.

According to its Statutes, the ESRF shall support the use of the facility by the scientific communities of the Contracting Parties. Besides supporting the utilization of the funded beamlines, the ESRF offers the possibility of establishing further beamlines from bending magnets to groups from the Contracting Parties (Collaborating Research Groups - CRG).

The corresponding arrangements with national or international scientific organizations, covering in particular the financing of construction and operation of these additional beamlines and specifying their use, are laid out in individual contracts concerning the construction and/or operation of these additional beamlines (specific contract) which are subject to approval of the ESRF Council by a qualified majority.

These specific contracts (as well as the regulations about the provision of accommodation as specified in Article 8 below) are limited to the validity of the lease contract between the ESRF and the ILL on the one hand and the CEA on the other, regulating the availability of the land on which the ESRF is built (currently up to the year 2018).

ARTICLE 1

Scope of application

1.1 These General Conditions apply to beamlines at the ESRF which are constructed and operated by Collaborating Research Groups for non proprietary research.

1.2 The provisions of these General Conditions are not subject to negotiations with individual CRGs. Any amendment of these General Conditions requires a written agreement between the ESRF and all CRGs, and is equally applicable to all CRGs.

ARTICLE 2

Parties and their representation, principles

2.1 The Parties concerned are :

- **the ESRF** as the host institute

- the Institution(s) responsible for the research team(s) taking part in the construction and operation of the beamlines and forming the Collaborating Research Group hereinafter (collectively) referred to as **the CRG**.

2.2 Each Party shall have a representative :

- The ESRF shall be represented by its Director General. The Director General may delegate the representation in specific matters (e.g. scientific, technical, administrative) to spokespersons as laid out in the specific contract.

- The CRG shall be represented by a spokesperson duly appointed who is also authorized to direct and coordinate its work. Where the spokesperson is not permanently present at the ESRF's premises, the CRG shall appoint another person who will be similarly authorized. For practical reasons, the person appointed must normally be present at the ESRF or another laboratory in Grenoble.

2.3 The CRG endeavours to have only one legal body being the ESRF's contact in financial matters.

2.4 As far as these General Conditions provide regulations for the CRG's personnel or property, they apply analogously to personnel and equipment from third party institutions deployed by the CRG at the ESRF in the frame of its activity, under the specific contract.

2.5 The Parties take the responsibility that their staff members comply with the General Conditions.

ARTICLE 3

Constitutive documents

3.1 The following documents shall constitute the formal basis for the construction and operation of a CRG beamline at the ESRF:

a) A specific contract (and its annexes) which sets out the detailed arrangements and provisions specific to the beamline and which must be agreed and signed by the ESRF and the Institution(s) forming the Collaborating Research Group.
The construction, installation and commissioning on the one hand, and the operation and maintenance of the beamline on the other hand shall be regulated by separate contracts.

b) The present General Conditions, which the Parties accept by signing the specific contract.

c) The Cost Refund Regulations setting out the financial compensation for services rendered to the CRG by the ESRF and vice versa.

d) Technical Annexes describing the general design of the beamline as well as ESRF standards and procedures.

3.2 As an indication, the essential parts of the specific contract are the following:

a) the list of the institution(s) forming the Collaborating Research Group;

b) the nomination of the spokesperson;

c) the definition of obligations of the Parties with respect to the construction, installation, commissioning, operation and maintenance of the beamline;

d) a timetable for the construction, installation and commissioning of the beamline;

e) an explicit reference to the General Conditions which the Parties accept.

ARTICLE 4

Independence of the CRG

During the performance of the specific contract the CRG shall be an independent contractor retaining complete control over its personnel and operations conforming to all statutory requirements with respect to all its staff with the exception foreseen in § 9.3 (Safety) below. Neither the CRG nor its staff shall be, in any sense, employees or agents of the ESRF.

ARTICLE 5

Obligations of the ESRF

5.1 The ESRF assigns a location for the beamline to be detailed in the specific contract and reserves it for the CRG as long as the construction and operation of the beamline is covered by a specific contract.

5.2 The ESRF assures free access to its premises for CRG staff announced beforehand subject to security and safety regulations applicable also to ESRF staff and ESRF users. The CRG's personnel working on the ESRF's premises will be officially registered according to the access regulations for the joint ESRF/ILL site.

5.3 The ESRF is in charge of the part of the beamline from the storage ring to the shielding wall of the storage ring tunnel (beamline front end). Construction, installation, commissioning, operation and maintenance of this part of the beamline will be financed from the ESRF budget, provided that no specific requests (e.g. wide angle front-ends) are requested by the CRG.

5.4 Subject to the signature of the specific contract, the ESRF shall provide synchrotron radiation to the beamline, at no cost for the CRG. The parameters of the synchrotron radiation beam aimed at by the ESRF are specified in the ESRF's Technical Annex to the specific contract.

5.5 The ESRF provides service connections and the corresponding supply to the beamline as specified in the ESRF's Technical Annex. Electrical connections will, at the CRG's expense, be equipped with meters.

5.6 The ESRF provides the following services to the CRG:

5.6.1 Reception: registration, security badges, etc.

5.6.2 Safety: advice, inspection, control, dosimetry.

5.6.3 Medical Service: first aid.

5.6.4 Connection of the beamline control and the data acquisition system to the ESRF computer network.

Procurement of devices for data acquisition and data handling at the beamline is up to the CRG.

5.6.5 Handling devices (cranes, forklifts etc.) which may only be operated by ESRF staff.

5.7 The ESRF offers the possibility to the CRG to make use of the following equipment or services:

5.7.1 Self service workshops (to be used by authorized CRG staff only).

5.7.2 ESRF workshops and laboratories.

5.7.3 Supply from ESRF stores.

5.7.4 Provision of accommodation to the CRG by the ESRF subject to the regulations set out in Article 8 of the General Conditions.

5.7.5 Telecommunications (telephone, fax), normal letter post and photocopying.

5.7.6 Joint ESRF/ILL restaurant. The CRG's staff and users are entitled to E category cards and visiting companies to F category cards. The CRG may subsidise these costs in part or totally to it's staff.

5.7.7 Visitors accommodation facilities (e.g. Guest house). Rooms can be made available to CRG users or visitors if they are not needed for ESRF users which are treated with priority. Reservations will not be accepted more than two weeks in advance.

5.7.8 Purchasing of equipment for CRG beamlines via the ESRF is subject to the provisions of Articles 7.3 and 7.4 of the General Conditions.

5.7.9 Administrative services related to
- assistance with custom formalities,
- specific social welfare for non-French CRG staff,
- travel.

A list of the services that are required by the CRG is kept in the CRG Liaison office and updated regularly in consultation with the CRG.

5.8 On request and subject to the availability of resources, the ESRF may be able to provide other services.

5.9 The cost refund basis for services mentioned under Articles 5.5 to 5.7 is laid out in the Cost Refund Regulations (Annex 2 to the specific contract).

5.10 The ESRF allows the CRG to access technical information that becomes available to the ESRF and may be relevant for the construction and operation of the CRG beamline.

5.11 The ESRF will pay:

- the cost of consumables
- the repair costs of any damage to the beamline
- the cost of any replacement item

needed as a result of its use of a CRG beamline (details are given in the Cost Refund Regulations). Staff costs associated with the operation of the beamline will not be reimbursed.

ARTICLE 6

The CRG Liaison Office

The ESRF establishes the CRG Liaison Office to act as a central contact for the CRGs to

- forward CRG requests to ESRF service divisions,
- follow up CRG purchases and budget lines,
- support CRGs with work on beamline infrastructure involving ESRF service divisions as well as external companies,
- perform general secretarial assistance (user support etc.).

The CRG Liaison Office comprises the CRG Liaison Engineer as well as a technician and secretarial staff (at present one full technician and the equivalent of 2.1 secretarial posts distributed over three secretaries). The technician and the secretaries are supervised by the CRG Liaison Engineer.

All this staff is employed by the ESRF, the CRGs reimburse the ESRF for the salary costs of the technical and secretarial staff as laid out in the Cost Refund Regulations while the CRG Liaison Engineer is paid by the ESRF.

Offices for the CRG Liaison Engineer and the secretaries are provided by the ESRF while office and laboratory space for the CRG technician is paid for by the CRGs according to the Cost Refund Regulations.

ARTICLE 7

Obligations of the CRG

7.1 The CRG is in charge of the part of the beamline outside the shielding wall of the storage ring tunnel. This part will be financed by the CRG, i.e. in particular CRG funds have to cover completely the equipment, the transport of equipment, customs, construction, installation and commissioning including the corresponding manpower and travel costs, fees, software licences; during operation, the CRG will finance the maintenance of the beam line (except as provided for in Article 5.11).

7.2 Utilisation by the CRG of the supply, infrastructure or services provided by the ESRF as detailed in the specific contract, and any additional expenditure for the ESRF requested by the CRG or the costs of any damage or loss caused by the CRG will be refunded by the CRG.

7.3 As laid out in the Cost Refund Regulations, the ESRF will charge 15 % overhead on exactly quantifiable costs according to utilization. However, for each single order placed on behalf of the CRG by the ESRF, the overhead is limited to a ceiling of EUR 850,00 at 2005 prices. The overhead will not apply to certain fixed charges listed in the Cost Refund Regulations.

7.4 The ESRF will present invoices on a quarterly basis for all goods ordered. Invoices must be paid by the CRG within 45 days. Failure to pay within the due time will result in the addition of an interest charge at a pro rata rate of 1% per month from the date of invoice.

7.5 The CRG shall be solely responsible for, and shall meet all costs incurred in connection with, the employment and administration of its personnel and all matters relating thereto, including, in particular, salaries, insurance payments, medical attention, expenses arising out of the fulfilment of immigration requirements, personnel customs duties and personnel permits.

7.6 The CRG's personnel and its users will follow general regulations in force at the ESRF when working at the ESRF's premises, and follow corresponding instructions of the ESRF's Director General or his duly authorized representatives.

7.7 In case of serious offence against these regulations or instructions by the CRG's personnel or its users, or of any action detrimental to the normal operation of the ESRF, the ESRF will ask the CRG to take immediate remedial measures. If these measures prove to be ineffective the CRG has, at the ESRF's request, to replace any person responsible for such an offence.

7.8 Before beamline construction starts, the CRG shall appoint a qualified engineer to be permanently present at the ESRF, in order to ensure that any work carried out by the CRG conforms with ESRF standards (cf Article 10) and that contracts placed with external companies, particularly for work in the Experimental Hall, are supervised by qualified CRG staff.

7.9 From the beginning of operation of the beamline, the CRG provides service to its own users and to general ESRF users sharing part of the beam time (cf. Article 12.3). To this end the CRG will ensure that three people are available at any time in Grenoble, one of whom shall be a scientist and one a technician.

7.10 Any experiment carried out on the CRG beamline, either by its own users or by ESRF users, must have the prior approval of the ESRF safety group. To ensure this approval, all proposals to carry out experiments must be submitted to the ESRF users office at least one month in advance.

Exceptionally, during the commissioning or maintenance of a beamline and when non hazardous substances are proposed, safety approval may be sought not less than one week in advance. If this procedure is not respected, user access to the ESRF cannot be guaranteed, and the ESRF safety group will be entitled to stop the experiment immediately.

7.11 If the specific contract is terminated, not extended or not replaced by a similar one, the CRG undertakes at it own cost to dismantle completely the beamline outside the shielding wall unless the ESRF is interested in taking over part of the equipment. In this event the specific conditions shall be settled by agreement between both Parties.

Ownership of any fittings or improvements to premises made available to the CRG (cf. Article 8), even those carried out with the ESRF's agreement, shall devolve legally, without right to compensation, to the ESRF. Movables shall remain the property of the CRG.

ARTICLE 8

Provision of accommodation

8.1. Principles

8.1.1 The ESRF provides accommodation for CRGs based on the principle that this shall not incur extra costs to the ESRF. Thus, the ESRF cannot guarantee to make accommodation available to the CRG unless the resources have been provided to construct the buildings needed. These construction costs normally are covered by a bank loan with a repayment period of not more than 10 years. The interest, amortisation and running costs (maintenance, consumables) will be paid by the CRG occupying the premises, according to the regulations of this Article. After the settlement of the bank loan the regular payment will be reduced to the actual running costs. The ESRF will be the owner of the premises.

8.1.2 The space made available to each CRG is listed in the Cost Refund Regulations setting out the surface, the quarterly payment and the end of the repayment period of the bank loan (where appropriate) for each room occupied by the CRG.

8.1.3 An extension of the provision of accomodation beyond the repayment period of the bank loan (where appropriate) as indicated in Article 8.1.1 above, requires the express agreement of both Parties. The ESRF endeavours to ensure the provision of appropriate space throughout the duration of the specific contract with the CRG.

8.1.4 In the event that the specific contract with the CRG is cancelled for whatever reason, the provisions of this Article, with the exception of Article 8.4.1, shall also be cancelled and the CRG shall loose all its rights in relation to the accomodation that is subject of this Article.

8.2 Conditions of use

8.2.1 The CRG shall take the premises as specified in Article 8.1.2 and shall be responsible for their eventual conformity with the regulations concerning safety in a working environment. The CRG will not raise claims against the ESRF (owner of the premises) or against the CEA (owner of the land) for possible faults or latent defects in the floor or the basements. In the same way, the CRG agrees not to raise claims against the ESRF or the CEA for any charges, which arise from adaptations of the premises.

8.2.2 The CRG shall use the premises only for the purpose specified in the specific contract with the CRG. All other activity, in particular commercial activity, is forbidden and may be sanctioned in accordance with Article 8.4. below.

8.2.3 The use of the premises by the CRG shall not present any danger or inconvenience to the ESRF environment and in particular shall not entail any modification to the ESRF installations. The CRG shall carry out work requiring civil engineering works or requiring modifications to the basic structure of the building only with the prior written agreement of the ESRF.

8.2.4 The CRG shall be responsible for maintaining the premises in good order during the period of its use. The CRG shall immediately inform the ESRF of any damage to the premises. Repairs shall only be carried out after consultation with the ESRF.

8.2.5 The CRG must not dispose of products, which may constitute a contamination hazard or which are subject to specific arrangements, into the pipes leading to underground networks.

8.2.6 The competent ESRF services (Safety Group, Technical Services, etc.) shall have free access at all times to the premises in order to check that the Safety Regulations (cf. Article 9 below) are being fully respected and that the building is cleaned and maintained properly. Otherwise the ESRF renounces its right of access to and use of the premises made available to the CRG throughout their provision.

8.2.7 The CRG may cede its rights to use the premises in part or entirely only on the condition that the ESRF gives its prior written agreement

8.3 Financial provisions

8.3.1 In return for the use of the premises, the CRG pays to the ESRF contributions towards:

- the initial construction costs of the premises (if applicable),
- the maintenance costs of the premises, and
- the provision of basic utilities.

8.3.2 The contribution towards the initial construction costs covers the amortization and the interest of the bank loan that was used to finance the construction of the premises. It will disappear once the bank loan is fully settled (cf. article 8.1.1.).

8.3.3 The annual contribution towards the maintenance costs of the premises is set at 2% of the investment costs of the space provided. It covers repairs resulting from normal and reasonable use of the premises. It does not cover other damage, in particular, that caused by a fault of the CRG. Corresponding costs shall be borne by the CRG.

8.3.4 The cost of the provision of basic utilities is set out in the Cost Refund Regulations and shall be reviewed annually. In 2005 the annual contribution for basic utilities amounts to 30,49 € per m^2.

8.3.5 These payments are quarterly invoiced by the ESRF to the CRG. Value Added Tax at the appropriate rate in force at the date of invoicing applies to all three types of contributions.

8.3.6 The total financial contribution of the CRG towards the costs mentioned above are specified in the corresponding section of the Cost Refund Regulations.

8.4. Cancellation

8.4.1 If the CRG abandons the use of the premises provided by the ESRF before the end of the payment periods mentioned in Article 8.1.1 above, it shall pay the ESRF an amount permitting the ESRF to pay off the remaining debt from the bank loan.

8.4.2 The ESRF may legally end its obligations arising from this Article, without compensation, in the event of non respect by the CRG of the provisions of Article 8.2.2 to Article 8.2.7 above.

The provisions of Article 8.4.1 shall also apply in these situations.

ARTICLE 9

Safety and radiation protection

9.1 The ESRF's overall responsibility in safety matters for the whole facility includes the CRG beamlines and the accommodation made available to the CRG.

9.2 The CRG accepts the right of the ESRF's services to carry out safety inspections.

9.3 The authority given to the ESRF's safety officers vis-à-vis ESRF staff applies also vis-à-vis CRG staff and users working on ESRF premises.

9.4 The CRG undertakes to respect the laws, regulations and other provisions in effect at the time of the contract for safety, radiation protection and the prevention of accidents, including the ESRF's safety requirements. The ESRF will provide a full description of the safety regulations and keep the CRG informed in case of change. The CRG shall inform its staff and users deployed for work at the ESRF's premises accordingly.

9.5 The CRG is solely responsible for the compliance of its staff and users with the provisions mentioned in Article 9.4.

9.6 The CRG shall appoint, with the agreement of the ESRF, a person responsible in matters of safety for the coordination with the ESRF's safety officers according to the ESRF's safety and radiation protection policy. For practical reasons the person appointed must normally be present at the ESRF or at another laboratory in Grenoble.

ARTICLE 10

Technical standards

10.1 In view of the partial use of the beamline by general ESRF users, and in order to facilitate maintenance, the CRG commits itself to respect technical standards relating to vacuum, electronics and control, safety devices (including hutches, shutters, absorbers), fluids, electrics and others as established in the ESRF's Technical Annex (Annex 3 to the specific contract). The standard ESRF Personnel Safety System (PSS) shall be installed on the beamline by the ESRF at the CRG's expense.

10.2 The CRG shall submit the design of the different elements of the beamline to the ESRF for check in this respect. The ESRF can ask for modifications in view of standardisation. The design is considered to be accepted as conforming if the ESRF does not react within four weeks after receipt of the plans.

ARTICLE 11

Property

Equipment supplied by each of the Parties remains the property of the same Party, with the exception set out in Article 7.11.

ARTICLE 12

Sharing of the utilisation of the beamline

12.1 The ESRF envisages by and large the following distribution of beam time during a year:

- Winter shutdown 33 days
- Summer shutdown 22 days
- Interim shutdowns 3 x 9 days
- Machine dedicated runs 53 days
- X-ray production runs:
  - beamline maintenance and commissioning 50 days
  - scheduled beam time for experiments 180 days

The exact amount of beam time for experiments at the CRG beamline shall be agreed between the CRG and the ESRF based on the CRG's planning of the above mentioned maintenance and commissioning activities during X-ray production runs.

12.2 From the start of operation of the beamline, the CRG is entitled to use 2/3 of the scheduled beam time for its scientific activities.

12.3 The beamline including either all of its instrumentation or part of it as detailed in the specific contract is made available to the general ESRF users during 1/3 of the scheduled beam time.
The share of beam time to be given to general ESRF users will be grouped to at most two different blocks per semester if not otherwise agreed in writing between both Parties.

12.4 Before allocating beam time at a CRG beamline to general ESRF users, the Director General will ask the CRG for assessments on the technical feasibility at their beamline of the projects proposed by the respective general ESRF users.

ARTICLE 13

Liability

13.1 Apart from the provisions of Articles 5.11 and 7.2, the Parties shall not be mutually liable for any damage to persons or property or any pecuniary loss arising out of or in connection with the specific contract, and inflicted by either Party on the other, its facility or personnel, except to the extent that such damage or loss has been caused intentionally or, in whole or part, by gross negligence.

13.2 Neither the ESRF nor the CRG shall be liable for any failure to perform as required by the specific contract, to the extent such failure to perform is caused by unforeseeable technical problems or by any other reason beyond ESRF's or the CRG's control.

ARTICLE 14

Insurances

14.1 Both Parties provide evidence that they are sufficiently insured or financially protected against the risks resulting from their liability (cf. Article 13.1). For the CRG this refers to the beamline and the accommodation space.

14.2 The ESRF offers that the equipment belonging to the CRG and installed on the ESRF site can be insured against the risk of fire, explosion, catastrophic natural events, electrical damage and water damage under the ESRF's general insurance scheme. In this case the CRG would bear the extra cost.

14.3 The ESRF offers that the CRG's and its staff's civil liability shall be covered, in case of damage caused to third parties on the ESRF site, by the corresponding insurance policy of the ESRF. The CRG will bear the additional cost due to this extension of the ESRF's insurance.

ARTICLE 15

Permits and licences

15.1 The CRG shall be solely responsible for complying with all regulations relevant to their activity and for taking the necessary steps to obtain any permit or licence required for the performance of the specific contract under French laws and regulations in force.

15.2 The ESRF may terminate the specific contract if the CRG is unable to obtain any permit or licence required for its performance.

15.3 However, where the ESRF itself has to be licensed under French law to enable a CRG to carry out a particular activity (e. g. measurements on radioactive samples), the ESRF will seek to obtain the necessary permits. The costs incurred by the ESRF will be borne by the relevant CRG.

ARTICLE 16

Publications

16.1 Each Party shall inform the other about the intention to publish any material about the construction and the operation of the beamline.

16.2 The CRG beamline shall always be acknowledged in publications by ESRF scheduled users, even if these publications are not co-authored by CRG staff. Likewise the ESRF shall be acknowledged in publications resulting from experiments carried out by the CRG's own users.

16.3 The exploitation of the beamline is normally restricted to non-proprietary research, in which case all scientific results achieved are to be published within one year after termination of the experiments, or at least written in form of an experimental report.

ARTICLE 17

Proprietary Research

Proprietary research may exceptionally be carried out on a CRG beamline, only with the specific written agreement of the ESRF based on regulations set by the ESRF management. In addition, the provisions of Article 7.10 (approval by the Safety Group) of this document will apply.

ARTICLE 18

Intellectual property

18.1 The CRG shall be the owner of all rights in the results obtained by staff employed by the CRG itself in the course of their duties. If any of these results constitute inventions, the CRG may apply in its own name, at its own cost and for its own benefit for intellectual property rights in any country where it considers such protection necessary.

18.2 In that case the ESRF shall be entitled to obtain from the CRG on request a licence for research or for purposes other than research. This licence shall be free of charge for research activities conducted by the ESRF. For other than research purposes the licence may be granted on conditions more favorable than those of licences granted to third parties.

18.3 If the CRG decides not to apply for such protection in one or more countries, the CRG will inform the ESRF in due time and the ESRF may, with the consent of the CRG, apply for such protection in its own name, at its own costs and for its own benefit.

ARTICLE 19

Disputes

19.1 The specific contract and these "General Conditions" are subject to French laws and regulations.

19.2 In case of dispute the Parties agree to try to settle the matter in an amicable way. If they do not succeed, the Director General of the ESRF will present the case to the ESRF Council for advice.

19.3 Any dispute between the ESRF and the CRG or any claim by one Party against the other which cannot be settled by the Parties out of court shall be brought before the Courts of Grenoble.

19.4 In the event a court of competent jurisdiction holds any provision of the specific contract or these "General Conditions" to be invalid, such holding shall have no effect on the remaining provisions of the contract and the "General Conditions", and they shall continue in full force and effect, unless the Parties decide otherwise.

Annex 2 to the Contract between the ESRF and CRG/SNBL concerning the operation of the beam line BM01 at the ESRF

REGULATIONS FOR COST REFUNDING BY COLLABORATING RESEARCH GROUPS

1. Introduction

1.1 Basic principle

These regulations for cost refunding are based on the principle that the ESRF shall not incur extra costs as a result of the activity of the CRGs, other than the operating costs of the CRG beamlines during their utilisation by ESRF users. The operating costs related to the utilisation by ESRF users will in practice constitute a reduction of the cost refunds made by the CRG. The operating costs to be borne by the ESRF are detailed in section 4 below.

1.2 Types of cost refunding

Cost refunding refers to supply or services provided by or through the ESRF to the CRG. There are different types of provision:

1.2.1 Exactly quantifiable costs and overheads

For some supplies and services, the use by the CRG is exactly measurable and can therefore be invoiced to the CRG according to consumption. These are listed in section 2 below.

In accordance with the General Conditions, the ESRF will charge an overhead of 15 % (unless otherwise specified) on these exactly quantifiable costs. However, the overhead will be limited to a ceiling of 850 € for each single order processed for the CRG by the ESRF.

The overhead essentially refers to the administrative treatment of the supply and services mentioned in section 2 below. For all quantifiable costs the ESRF Finance and Purchasing Service prepares the invoices related to the utilisation, calls for the corresponding funds, controls the payments and cares for proper accounting. For purchases via the ESRF, the ESRF administration deals with calls for tender, preparation of contracts, orders and follow ups of the payment procedure. Besides the direct personnel costs (salaries, social charges) for staff dealing with CRG matters (with the exception of services included in §§ 2.11, 2.12 and 2.13 below), the means

necessary for their work (room, office equipment, telephone, consumables,...) are taken into account in determining the level of overhead charged.

In addition the overhead compensates for the sum of all the minor additional costs created by CRG activity on site but not covered by the specific items listed above.

1.2.2 Fixed charges

For other services there are either no means to measure the consumption by the CRG, or the effort necessary for its measurement is unreasonable in relation to the costs involved. Furthermore the use by a single CRG may be marginal compared to the use by ESRF staff and users, however, the sum from several CRG beamlines is likely to be significant. Fixed charges refer to the provision of general infrastructure and equipment and of services, these items are detailed in section 3 below.

Services rendered against fixed charges will not be subject to an overhead.

1.3 Taxes

In addition to the prices indicated in this annex, VAT at the appropriate rate (currently 19.6%) will be charged according to French law.

1.4 Price revision

The prices indicated in the present annex will be reviewed annually in consultation with the CRGs. Current prices and charges are available from the CRG Liaison Engineer.

2. Exactly quantifiable costs

2.1	Telephone, Telefax	Price per unit identical to that which is charged to the ESRF
2.2	Photocopy	Price per unit identical to that which is charged to the ESRF
2.3	Insurance	Price: actual premium rate fixed by the insurance company
2.4	Stockroom supplies	Price according to value of item withdrawn
2.5	Electricity	Price per unit (kWh) identical to that which is charged to the ESRF

2.6	Liquid Helium	Price per litre according to actual cost
2.7	Use of ESRF Service Divisions and major equipment not explicitly specified in these regulations (e.g. exceptional services rendered by the Vacuum Group, Technical or Computing Services etc.)	Price per hour or per intervention: according to pre-advised cost
2.8	Equipment for a CRG beamline purchased via ESRF (e.g. to benefit from favourable conditions)	Price: actual value of item purchased
2.9	Use of the Guest house (subject to availability)	Price: actual price according to the contract between the ESRF and the subcontractor in charge of managing the Guesthouse: (currently 26.73 €/night, including breakfast)

The following services are mandatorily provided to all the CRGs by the ESRF:

2.11 Secretarial Support

To cover the cost of secretarial work incurred during the construction and operation of CRGs, and to assist with work resulting from user visits, the ESRF charges the CRGs the actual costs of the employment of the secretarial staff (including social charges) as follows:

- 20% of a full secretarial post is paid by the OGG (INFM Operative Group in Grenoble).
- The remainder is evenly distributed between the other CRGs taking into account that CRGs operating two-branch beamlines will pay two shares.

The usual overhead charge of 15% is currently reduced to 5%.

2.12 Technical Support

To cover the cost of technical support to the CRGs during the construction and operation of their beamlines, ESRF charges the CRGs the actual costs of the employment of (at present) one full technician (including social charges) to be evenly distributed between (at present) 12 CRGs.

The usual overhead charge of 15% is currently not levied.

2.13 Services provided by the Safety Group:

To cover the cost of services provided by the Safety Group, the ESRF charges the CRGs the actual salary costs (including social charges) of one technician in the Safety Group to be evenly distributed between (at present) 12 CRGs.

The usual overhead charge of 15% is currently not levied.

2.14 Computing assistance with beamline control systems

To cover the cost of computing assistance with beamline control systems, the ESRF charges 100% of the actual costs of the employment (including social charges) of an engineer from the BLISS Group (Experiments Division) to be evenly distributed between (at present) 12 CRGs

The usual overhead charge of 15% is currently not levied.

2.15 The staff funded in accordance with §§ 2.11 and 2.12 will be employees of the ESRF and will be under the supervision of the CRG Liaison Engineer while the staff funded in accordance with §§ 2.13 and 2.14 will be under the the supervision of the Safety Engineer and the Head of the BLISS group, respectively.

3. Fixed charges

These charges refer to the provision of general infrastructure, equipment and services which fall into the three categories below :

3.1 ***Services mandatorily provided to the CRG by the ESRF*** (Article 5.6 of the General Conditions)

3.1.1 Administrative and Directorate Services:

- reception, formalities, registration, security badges, canteen cards, contact with *Préfecture* for non-French staff or users,...;
- medical service: casualty, first aid;
- library services.
- travel: ordering and reservation for CRG staff and users

The ESRF charges each CRG a lump sum for the corresponding personnel and administrative cost of 2500 €/year

3.1.2 Use of cranes and handling facilities

Price for each CRG: lump sum 1 700 € /year

3.1.3 Fluids (Deionised water, industrial water,...)

Price for each CRG: lump sum 2 545 € /year

3.1.4 Supply of pure gases and gas mixtures from the ESRF stores

Price for each CRG: lump sum 515 € /year

3.1.5 Connection of the CRG beamline control and data acquisition system to the ESRF computing network. This connection opens the possibility to use

- some central facilities for e.g. e-mail, data transfer or data conversion and
- the local server to be established for groups of beamlines. This server will allow processing and analysis of data and will be equipped with some expensive peripherals (colour plotter, back-up facility, etc.).

To cover an appropriate share of the cost for one local server including activation of the connection to the network and also for current maintenance and upgrading of the equipment, the ESRF charges each CRG a lump sum of

5 150 € /year

3.1.6 Maintenance of equipment jointly owned by all the CRGs and the provision of tools for the CRG technician, the ESRF charges each CRG a lump sum of

845 € /year

3.1.7. Liquid Nitrogen

For consumption of up to 10 000 litres/year, a fixed sum will be charged to cover the consumption and an appropriate share of the storage and distribution system

Price for each CRG: lump sum 850 € /year

Where in the opinion of the ESRF consumption exceeds 10 000 litres/year or is likely to exceed this figure, a higher fixed charge will be negotiated.

3.2 ***Sevices exclusively offered by the ESRF to the CRGs (see § 5.7 General Conditions).***
These services are optional, but if used, may only be supplied to the CRG by the ESRF.

3.2.1 Accommodation

Where existing accommodation can be provided within the Central Building, the cost will be 120 € /m²/year

The cost of a small laboratory and an office for the CRG technician will be divided between the CRGs. This service can only be opted for by all CRGs, that is, withdrawal from this arrangement can only be requested by a majority of the CRGs.

The cost of this service will be evenly distributed between (at present) 12 CRGs.

To meet the demand of the CRGs for accommodation the ESRF has built extensions to the Experimental Hall and might be able to build additional accommodation if required. The provision of funds to cover the construction costs, the regulations for the use of the premises by the CRGs as well as the general regulations concerning the contributions the CRGs pay to cover construction and running costs are specified in Article 8 of the General Conditions.

The premises made available to the CRGs as well as the financial contributions to be paid by each specific CRG are listed in the following table.

room	surface	occupied by CRG(s)	approx. price per m*m and month	total price per quarter	end of bank loan/ rental agreement	
01-5-02	10,42	BM 30B / BM 32	18,46	577,05	06.2006	1)
01-5-03	49,67	BM02/30A/30B/32	18,46	2750,69	06.2006	2)
01-5-03A	23,40	BM02/30A/30B/32	18,46	1295,86	06.2006	2)
01-5-04	32,45	BM02/30A/30B/32	18,46	1797,04	06.2006	2)
01-5-06	20,31	BM02/30A/30B/32	18,76	1143,04	12.2009	2)
01-5-07	25,42	BM02/30A/30B/32	18,76	1430,63	12.2009	2)
01-5-08	14,97	BM02/30A/30B/32	18,76	842,54	12.2009	2)
01-5-09	25,30	BM 30B	20,99	1593,15	12.2009	
03-5-12	12,60	BM 01	18,46	697,80	06.2006	
03-5-15	15,10	BM 01	18,46	836,24	06.2006	
03-5-16	87,33	BM 01	18,46	4836,26	06.2006	
03-5-13	17,41	BM 01	20,99	1096,01	12.2009	
03-5-14	15,05	BM 01	20,99	947,70	12.2009	
07-5	154,98	OGG	20,93	9731,49	06.2009	
07-6-06	30,01	BM 07	18,46	1661,82	06.2006	
07-6-02	16,50	BM 08	18,46	913,77	06.2006	
07-6-03	48,12	BM 08	18,46	2664,84	06.2006	
07-6-03A	11,40	BM 08	18,46	631,33	06.2006	
10-5-02	36,99	BM 16	23,98	2661,42	07.2012	
10-5-03	36,99	BM 16	23,98	2661,42	07.2012	
10-5-05	45,49	BM 14	23,98	3272,53	07.2012	
10-5-06	16,00	BM 14	23,98	1151,04	07.2012	
10-5-07	13,00	BM 14	23,98	935,22	07.2012	
21-1-20	24,96	BM 25	18,31	1371,05	10.2008	
21-1-21	10,59	BM 25	18,31	581,71	10.2008	
21-1-22	21,42	BM 25	18,31	1176,34	10.2008	
21-1-23	7,00	BM 25	18,31	384,51	10.2008	
21-6-02	49,44	BM 20	18,46	2738,02	06.2006	
21-6-02A	15,54	BM 20	18,46	860,39	06.2006	
21-6-02B	16,83	BM 20	18,46	938,05	06.2006	
21-6-03	16,94	BM 20	18,46	869,75	07.2012	
21-6-04	23,29	BM 20	18,46	1289,82	07.2012	
21-6-05	28,16	BM 26	18,46	1559,50	07.2010	
21-7-07	17,00	BM 25	17,10	872,10	10.2008	

21-7-07A	36,00	BM 25	17,10	1846,80	10.2008
21-7-07B	7,00	BM 25	17,10	359,79	10.2008
30-5-02	48,50	BM 26	18,46	2685,93	06.2006
30-5-02A	19,01	BM 26	18,46	1052,77	06.2006
30-5-02B	14,00	BM 26	18,46	775,46	06.2006
30-5-02C	24,88	BM 26	18,46	1378,13	06.2006
30-5-02D	14,83	BM 26	18,46	821,56	06.2006
30-5-04A	14,81	BM 26	18,46	820,02	06.2006
30-5-05	29,00	BM 28	18,46	1606,02	06.2006
30-5-05A	18,51	BM 28	18,46	1024,86	06.2006
30-5-05B	13,11	BM 28	18,46	725,80	06.2006
30-5-05C	10,41	BM 28	18,46	576,29	06.2006

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1) payment shared as follows: EUR 288,53 per quarter by BM 30B
EUR 288,52 per quarter by BM 32

2) payment shared as follows: EUR 2141,90 per quarter by BM 02, 30B and 32
EUR 2834,10 per quarter by BM 30A

3.2.2 Network connection

1Gbps connection	at equipment cost
100 Mbps connection	currently included in 3.1.5

3.2.3 Extended user account on NICE to allow use of existing NICE software including 500 GByte of data storage regularly backed up

Price for each participating CRG: 6 790 € /year

The standard account on NICE for CRG staff allowing access to the NICE and Email system including data storage capability of 500 MByte is currently free of charge.

3.3 ***Services offered by the ESRF to the CRGs (see § 5.7 General Conditions).***
These services already exist at the ESRF and their use by the CRG is entirely optional. Services not used will not be charged for. However, if any service is used at least once during the year, the full annual charge will be applied.

3.3.1 Access to Self Service Workshops

Price for each participating CRG: lump sum 1 700 € /year

3.3.2 Alignment service

Price for each participating CRG: lump sum 1 700 € /year

3.3.3 Occasional use of ESRF specialist laboratories (in the central building, PLUOs, etc.)

Price per laboratory for each participating CRG: lump sum 1 700 € /year

A current list of accessible laboratories is available from the CRG Liaison Engineer.

3.3.4 Optional Administrative Services

- Social welfare: Assistance in housing (temporary or permanent) and in schooling (for children of non-French staff).

The ESRF charges each participating CRG a lump sum for use of these services of 2 545 € /year

- Language courses:

Price : actual cost

3.3.5 Access to equipment in the ESRF detector, mechanics, electronics and sample environment pools

Price for each participating CRG: lump sum 7 850 €

This amount covers access for two years. At the end of this two-year period, a lump sum of 10% of the initial amount (i.e. 785 €) will be charged annually. The payment is not intended to cover the repair of items borrowed from the pools. These will be invoiced at cost. A list of available items can be obtained from the CRG Liaison Engineer.

4. Operating costs

According to § 7.1 of the General Conditions *"...during operation, the CRG will finance the maintenance of the beamline (except as provided for in § 5.11)"*. § 5.11 stipulates that *"The ESRF will pay :*

- *the cost of consumables*
- *the repair costs of any damage to the beamline*
- *the cost of any replacement items*

needed as a result of its use of a CRG beamline..."

4.1 Cost of consumables

The costs under this heading are those necessary to:

4.1.1 Operate the beamline,
e.g. electricity, fluids (water, compressed air, liquid nitrogen, etc.).

4.1.2 Carry out experiments,
e.g. films, glassware, rubber gloves, etc.

To reimburse the CRG for costs incurred under § 4.1.1, the ESRF will pay from the start of the CRG operation contract 1/3 of the actual costs, 1/3 of an extended NICE account (500 GByte storage), if opted for by the CRG, and 1/3 of the CRG's contribution to the Safety Group (article 2.13).

To reimburse the CRG for costs iuncurred under § 4.1.2., the ESRF will pay from the start of the CRG operation contract a lump sum of 3 235 €/year. For double beamlines, this sum may be increased pro-rata up to 6 470 €/year depending on the ESRF's use of the beamline.

If a specific ESRF user proposal requires the CRG to purchase individual items costing more than 1 607 €, then such expenditure shall be dealt with by the CRG making a request for funding to the ESRF, through the CRG Liaison Engineer. The ESRF shall subsequently make the appropriate arrangements with the proposer concerning the purchase.

4.2 Repair costs following any damage to or breakdown of the beamline and cost of replacement items

The ESRF will pay for repairs to, or replacement items for, the CRG beamline which are necessary as a result of damage caused by an ESRF user or breakdowns which occur during a scheduled ESRF experiment, provided that the breakdown is not a result of inadequate maintenance of the beamline by the CRG and is not provided for in the lump sum payment under § 4.1. above. The ESRF user will be required to sign a declaration that the beamline was damaged by him/her, or that the beamline broke down during his/her experiment. It is the responsibility of the CRG to obtain such a declaration from the ESRF user.

Annex 3 to the Contract between the ESRF and CRG/SNBL concerning the operation of the beam line BM01 at the ESRF

ESRF's TECHNICAL ANNEX

1. Introduction

A full description of all the technical aspects of building and operating a beamline would require a very lengthy manual. Rather than attach such a document to the contract, the following list of current documentation is provided as a starting point for the more detailed studies which will be required as work progresses. The ESRF also provides a range of technical information and useful contact names on the internet, http://www.esrf.fr, but interested parties are asked to contact the CRG Liaison Engineer in the first instance (the email address can be found on the CRG web page).

2. Documents

Beamline PLC Interlock Systems

Standard Hardware and Software for Beamline Control and Data Acquisition

General Principles of Beamline Alignment

List of Specialist Laboratories

General Beam Parameters

3. General Technical Information

Architectural Drawings	of premises made available to CRGs (for offices and laboratories)
EXPH Floor Plan (showing the specific area of the EXPH available to the Beamline)	Drawing No 00.10.1001A
Front End Interface	Interlock Circuit Diagram
Electrical Power Available	86kW/beamline / 380V 3ph 125A
Fluids Available	Diagram of Terminal Box

4. Technical Standards

Experience with the first few CRG beamlines has lead to the conclusion that adequate standards, cost savings, and overall efficiency for both the CRG and the ESRF are most easily achieved when the beamline infrastructure and subsequent upgrades are purchased from and installed by companies currently working at the ESRF. For this reason the technical aspects are divided into mandatory and optional groups.

Visiting groups may be assured that the companies currently working at the ESRF have been selected as a result of international calls for tender, and that competitive prices have been negotiated. Cost estimates for the infrastructure will vary according to the complexity of the beamline and consequently are not given here. The CRG engineer will assist in providing further information and quotations for each CRG individually.

5. Mandatory

5.1 Radiation Safety

Hutch Specification	The ESRF requires that the hutch is constructed to a design which can be demonstrated to be radiation tight. This may be by use of an existing ESRF design, or by use of a system in operation at another laboratory having equally intense sources, subject to the approval of the ESRF.
Shutter Design	ESRF designs or ready built devices are available.
Personal Safety System	Standard systems must be purchased from and installed by the ESRF.
5.2 Electrical Installation.	After consultation with the CRG, the ESRF will provide a specification to ensure that the installation complies with in house requirements and that the work can be carried out by local contractors. A cost estimate will be provided for approval prior to the start of work.
5.3 Fluids Installation	As above
5.4 Survey and Alignment	Some hutches need openings for radial and circumferential surveys of the Experimental Hall.

5.5 Vacuum Interlocks	A standard system complying with the requirements of the ESRF Safety and Vacuum Groups will be specified by the ESRF during the CRG beamline design phase.

6. Optional

6.1 Beamline Control	Unix workstation, local ethernet, VME hardware, and extensive software is available.
6.2 Beamline Components	ESRF designs for standard components are available.

7. User Operation

Arrangements for the CRG private users, and for the ESRF public users during one third of the beamtime, are made by the CRG Liaison Office which can be contacted by email at : crg-off@esrf.fr

Annex 4 to the Contract between the ESRF and CRG/SNBL concerning the operation of the beam line BM01 at the ESRF

BEAMLINE TECHNICAL ANNEX

The ESRF delivers a 6mrad wide fan of synchrotron radiation to SNBL from bending magnet BM01. A water-cooled aperture plate at the entrance to the Optics Hutch (26m from the source point) divides this beam into two parts of width 2.5mrad and 1.0mrad, with a gap of 2.5mrad between the two beams. The fan of 2.5mrad width supplies the photons to BM1A, while the 1.0mrad beam provides the synchrotron radiation to BM1B. The beamline has been designed from the onset to allow both lines to operate simultaneously, and with a minimum of interaction between the X-ray optics, vacuum system, shielding and controls for each branch line.

The optical configuration of BM1A is a conventional arrangement of a vertically collimating mirror, followed by a double crystal Si(111) monochromator and a vertically focusing mirror. The beamline can be configured to operate without mirrors (in order to access higher X-ray photon energies, for example), although some manual realignment of the beamline components is necessary for the changeover. In normal operation, the Rh-coated mirrors provide vertical focusing and harmonic rejection while a sagittally bent second crystal focuses the beam horizontally. It is also possible to interchange the second crystal bending mechanism with a flat crystal mount, if a highly parallel beam is required.

The first crystal of the monochromator is water-cooled, as is the first mirror. The mirrors both have a fixed radius of curvature, and the optimum focal spot is roughly circular with a FWHM of about 300 microns. All optical components for BM1A are installed in the Optics Hutch, including the station shutter, which is positioned after the second mirror. This allows one to keep the X-ray beam on the optics when entering the Experimental Hutch, and hence improves the beam stability. The excellent mechanical and thermal stability of the X-ray optics (at least up to the present maximum current of 200mA) allows one to operate the beamline without a feedback mechanism. Most experiments are carried out in the spectral range from about 10 keV – 20 keV, although higher energies can be accessed if the mirrors are removed.

Both a Si(111) and a Si(311) channel-cut crystal are installed within the BM1B monochromator vessel, and a motorized mechanism allows either of the two crystals to be selected for a given experiment. This configuration enables the user to choose between the higher flux delivered by the Si(111) or the improved energy resolution, and higher energies, accessible from the Si(311).

BM1A Instrumentation

After passing through a set of secondary slits within the Experimental Hutch, the focused synchrotron beam can be delivered to either a multi-axis heavy-duty single crystal diffractometer (KM6 supplied by Oxford Diffraction Ltd, *née* KUMA Diffraction, Wroclaw, Poland) or to the MAR345 Image Plate set-up manufactured by MarResearch GmbH. The MAR345 instrument allows only a single rotation axis for the sample, and a slide provides variable distance between sample and detector. The diameter of the X-ray sensitive plate is 345mm, and a pixel resolution of either 100 or 150 microns can be selected by the user. The KM6 instrument is a κ-diffractometer

with the conventional 3 sample rotations (κ, ω and φ) and the detector angle θ. In addition, the diffractometer is mounted on two further rotation tables (ω' and θ') giving an additional degree of freedom to the orientation of both the sample and the detector.

The KM6 multi-axis diffractometer is equipped with both a point detector and a large area CCD detector onto the detector arm. The combination of movements available on the KM6 allows one to position the sample in an arbitrary orientation relative to the incoming synchrotron beam (and hence also to its polarization vector), and also to choose freely the angular coordinates of either of the X-ray detectors. This instrument provides a completely generalized platform on which to collect diffraction data. It can be configured either as a vertical or as a horizontal diffractometer, or indeed anywhere in between these scattering planes. Complete surveys of reciprocal space can be rapidly completed using the area detector, while the point detector provides the opportunity to investigate the profiles of individual reflections with high angular resolution. Information concerning the crystal orientation matrix and the diffractometer parameters can be passed smoothly from point detector to area detector configurations.

BM1B Instrumentation

The monochromatic beam in the BM1B Experimental Hutch passes through a set of secondary slits and can be delivered either to a high resolution powder diffractometer or to an EXAFS spectrometer. The powder diffractometer is equipped with an array of six motorized Si(111) analyzer crystals mounted on a rotation stage. The angular gap between individual analyzer crystals is 1.1°, and the normal data collection procedure is to scan all crystals through the entire range of interest in the powder diffraction pattern, and to sum together the data from each channel. Depending somewhat on the scattering power and volume of the sample, it takes about 4 – 6 hours to collect a complete, high quality powder pattern. Alternatively, a range of a few degrees of 2θ can be rapidly scanned, and the data from each detector pasted together. In this fashion, a selected range of about 10° of the powder pattern can be measured in a few minutes. Normally, the sample is contained within a spinning capillary, but a flat-plate texture attachment is also available.

The synchrotron beam can also pass by the powder diffractometer, and reach the EXAFS spectrometer positioned at the rear of the Experimental Hutch. Normally, a double-mirror assembly is inserted into the beam path for harmonic rejection. Various sizes of ion chambers which can be filled with sundry ionizing gases are used to monitor the flux incident on and transmitted by the sample, and, if necessary, also a reference sample. In addition to the equipment for transmission EXAFS, a 13-element multi-channel Ge solid-state detector is available for fluorescence data collection.