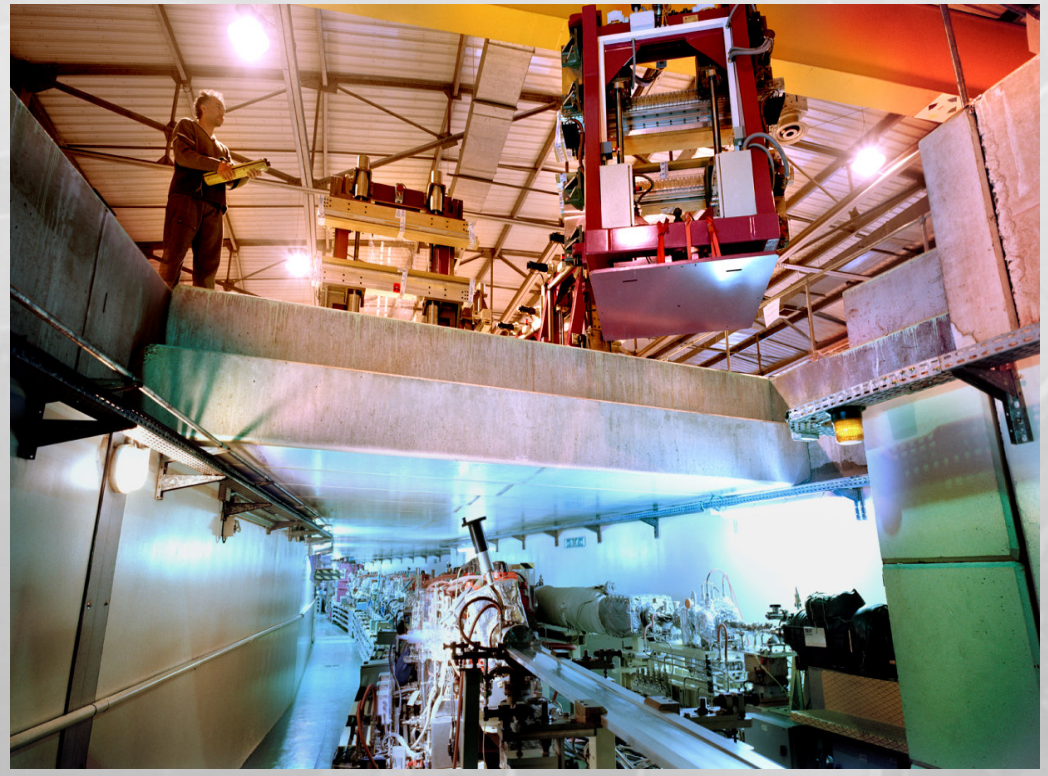
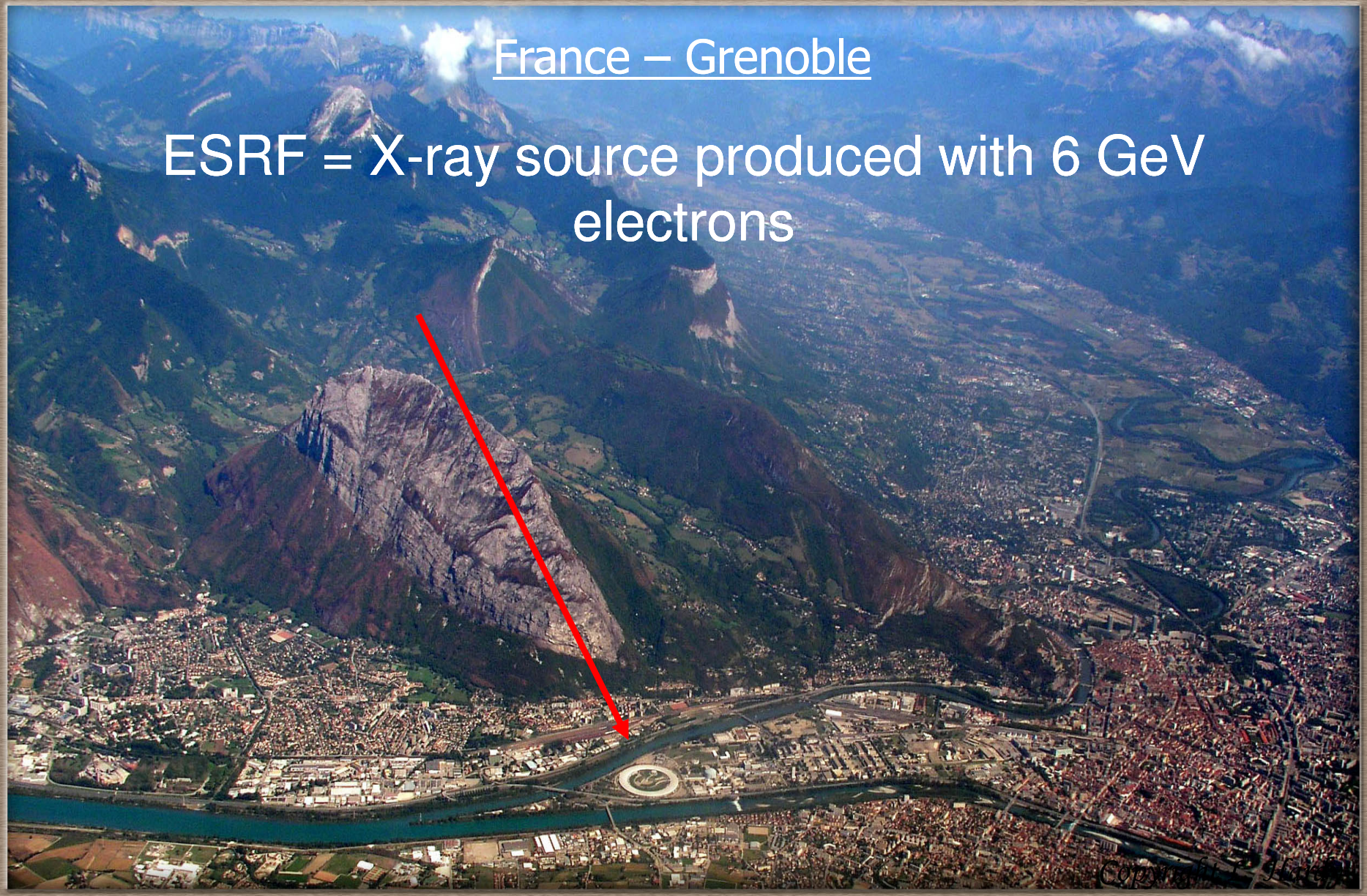


EVOLUTION OF THE ELECTRONIC LOGBOOKS AT ESRF

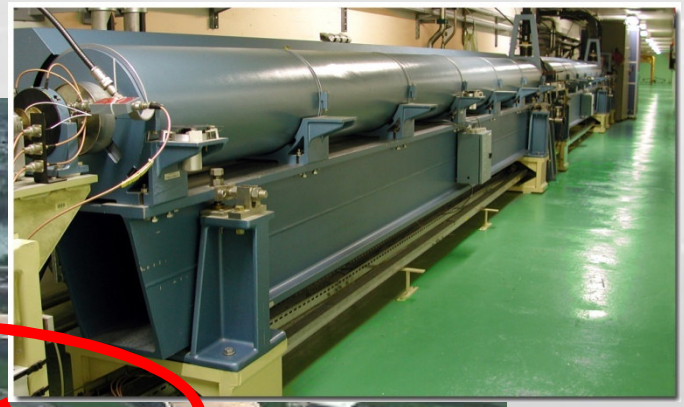
PCAPAC 2008 - SLOVENIA
Tuesday, 21st October 2008

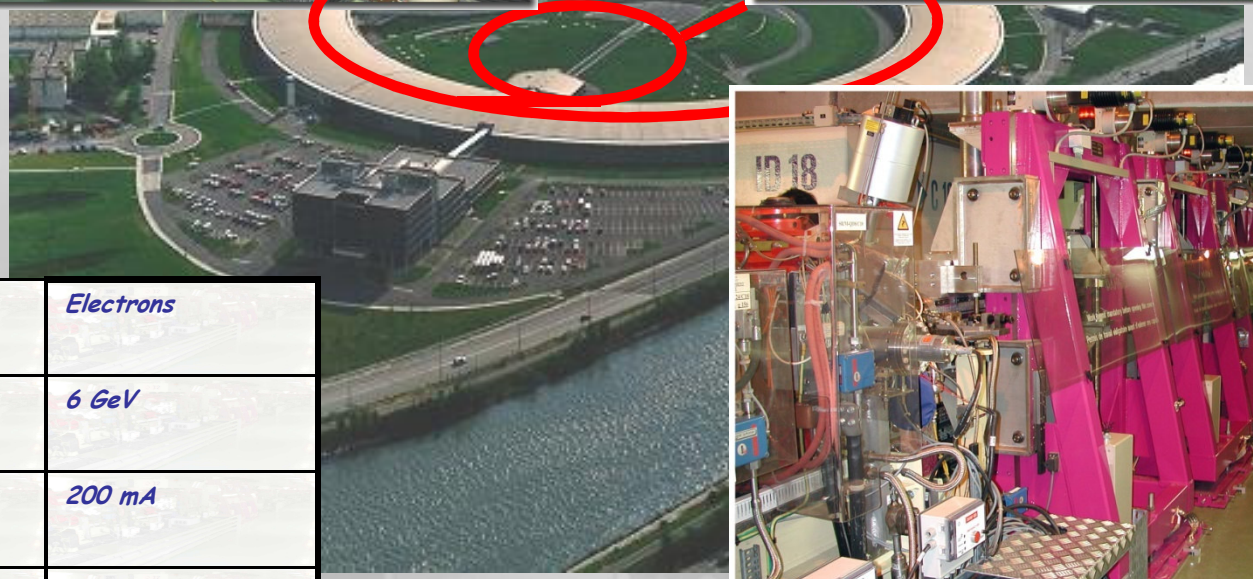
Electronic Logbooks at ESRF

European Synchrotron Radiation Facility



Electronic Logbooks at ESRF





Particles	Electrons
Energy	6 GeV
Intensity	200 mA
Hours/year	5600

Electronic Logbooks at ESRF

Electronic Logbooks at ESRF

1. WHY GET RID OF PAPER? …

- The Control Room has accumulated 30 logbooks / year ! =>
- No easy way to find information: mostly based on memory
- No way to filter the information
- Sometimes difficult to read handwritten information !
- Generally no room to write « post event » information or add a post comment
- « Never » available when you need it !
- And … no online (and fast) information flow to a group

Electronic Logbooks at ESRF

2. 2004: Three-level (in time) SPECIFICATIONS FOR NEW E-LOGBOOKS

The decision to move to an electronic logbook was based on us being able to obtain All SPECS of LEVELS 1 & 2

LEVEL 1 : WHAT WE WANTED IMMEDIATELY – the minimum required

- Accessibility from any PC/station at the ESRF on a Web Browser or from anywhere outside the ESRF (provided the user has an ESRF account !...)
- No nominal licence and no software to install / run to access the e-Log
- Must be be easily configured by a non-expert in programming
  - add the fields you want where you want
  - a list of options in a field could depend on another option in another field without any limits (equipment – sub equipment – sub sub …)

  = parent – children structure

Electronic Logbooks at ESRF

- Must have powerful filter criteria possibilities
  - one or more fields
  - keyword(s)
  - indexation in a pdf file
  - a part of a word in a field
  - and a mixture of the above possibilities
- Attachments: ANY file with any extension can be attached

MY USER'S – (future) ADMINISTRATOR'S - POINT OF VIEW :

- **A LOGBOOK DESIGNER SHOULD NOT ENTER IN ANY CODE:**
  A USER-FRIENDLY INTERFACE IS NEEDED FOR CONFIGURATION
- **THE « administrator » SHOULD NOT BE AN EXPERT IN DATABASES:**
  THE DATABASE SHOULD BE TRANSPARENT (or almost !).

Electronic Logbooks at ESRF

LEVEL 2 : WHAT WE WANTED BUT CAN WAIT for 'some time' TO OBTAIN

- **A powerful mailing system:**
  - **an automatic email of the log could be sent to one or more predefined person(s) DEPENDING on one or more options in one or more fields.**

  ***Examples*:**

  'meyer@esrf.fr':"Keyword='Software' and Beam_Line='ID14-3'

  Jens Meyer will receive all logs concerning software problems on ID14-3 only

  operation@esrf.fr': "Event='Failure (NO BEAM)

  The Operation Group receive an email when the beam is lost.

- **Screenshots: easy to get into the log and visualise it as a thumbnail**

- **Modular enough to add any future possibilities on request (tailored to ESRF requirements !)**

Electronic Logbooks at ESRF

LEVEL 3 : IT WOULD BE NICE IF ….

- Many logbooks could be structurally organized in tabs – sub - tabs etc
- A log could contain sub-logs (to put related events together)
- A log in a logbook could be linked to another log in another logbook

- A log could be AUTOMATICALLY created when a predefined criteria is matched (ex: if lifetime drops by 20 %, record pressure / gaps / intensity / etc)
- A log could be AUTOMATICALLY created every X hours (all beam parameters at the beginning of a shift)

→ Which means a link to TANGO

Electronic Logbooks at ESRF

3. Who will do it ?

- Software available from other Institutes ?
  - We investigated this option but our requirements couldn't be met
- Develop it internally ?....
  - Will it ever be finished according to the specs ? …
  - Will it be documented ? …
  - Who will maintain / upgrade with newer platforms ?...
  - 2 programmers / 1 year =~ 80 000 euros. Is it a good idea ??

We concluded that this kind of software must be provided by a reactive company.

Only 1 small company offered such a software application for which most of the constraints were already being taken into account and the remaining constraints could be easily added on request :

ST James Software in South Africa (14 people).

Experience of e-logbooks for Control Rooms for large energy Power Plant + Airport + Mines, etc

Electronic Logbooks at ESRF

4. The JLogBook (version 4 : from 2004 – still used at the ESRF end 2008)

FIRST IMPRESSIONS? **EXCELLENT !**

- **Download 20 Mb of .zip files + nice looking documentation.doc. FREE for 1 licence !**
- **Unzip and install 4 files.exe (including Apache / Python libraries) : ~ 10 minutes**
- **Type « pchardy » in my URL Web Browser and …**

David Benedinal - PHQ 636 - Physique subatomique

Login for IndexPage

Username: hardy
Password: ******
Login

logged out

IT WORKS !!

(Excellent first impression for a non expert in soft. engineering !)

WHAT WE GOT IMMEDIATELY: a « template » ready to be modified

Filter 200 days 13/11/03 14:50:3 Print Form Options Help Logout logged in as **nobody**

Site Central | User Name washop | Log Date 15 Oct 03 | Time 10:59 PM

Area wash | Message Can't maintain the level on Washing Tank 2. I will have to switch the lines over to 3. Doing this now.

Stream 2

Equipment Settling Tanks

Priority 2 | Attachment (no attachment) | Audit 20031015230023-log audit.log

Page 1 of 1. Print

Day	Log Date	Time	Area	Stream	Equip	Message	Site	Prty
Wed	15 Oct, 03	10:59 PM	wash	2	Settling Tanks	Can't maintain the level on Washing Tank 2. I will have to switch the lines over to 3. Doing this now.	Central	2
Sun	21 Sep, 03	05:39 PM	precip	4	Auxiliaries	Our seed size has gone way over the acceptable size. I am shutting down bank 4	Central	3
Thu	04 Sep,	11:26 AM	dig	1	Flash Tanks	We need to change the flash tank refurbish procedure to take account of the new failures.	Central	4

Each field clearly identified with all its characteristics

System Database Indexer Resource Categories Options Users logged in as **hardy**

Add Category Copy Category Delete Category

Name: Area # 1 | DB Format: STRING | Default | Read Only | Modify Action: Replace

Form: True | Label: Area | Column: 1 | Row: 2 | Width: 1 | Height: 1 | Type: MultiCombo

Grid: True | Heading: Area | Column: 3 | Width (%): 9 | Format: None | Merge: False

Tooltip: The Area in the site | Main Area: True | Color: True | Color Category: MAIN

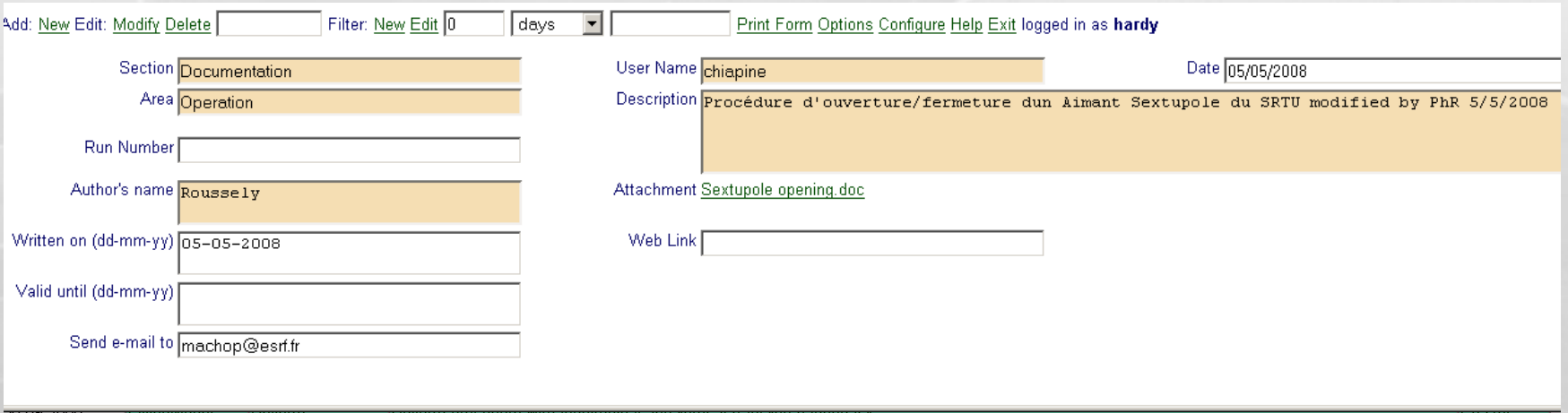
Modify Category

Area Options

Name	#	DB Format	Default	Read Only	Modify Action	Form:	Label	Column	Row	Width	Height	Type	Grid:	Heading	Column	Width (%)	Format	Merge	Tooltip	Main Area	Color	Color Category
Area	1	STRING			Replace	**True**	Area	1	2	1	1	MultiCombo	**True**	Area	3	9	None	False	The Area in the site	True	True	MAIN
Main	2	STRING				**True**	Section	1	1	1	1	Combo	**True**	Section	2	8	None	False	The main section	True	True	MAIN
LogDateTime	3	DATETIME		True		**False**	Date	4	1	1	1	Update	**False**	Date and Time	12	15	General Date	False		False	False	
Message	4	TEXT				**True**	Description	2	2	2	3	Text	**True**	Description	4	10	None	False	The Knowledge Description you want against this event.	True	True	MAIN
Author	5	STRING				**True**	Author's name	1	5	1	1	Text	**True**	Author	5	6	None	False	The procedure author's name	True	True	MAIN
UserName	6	STRING		True		**True**	User Name	2	1	1	1	Combo	**False**	User Name	6	10	None	False	The user name of the person who logged	True	True	MAIN

FIRST TEST ! Let's create a logbook to store all Control Room Procedures !

From the template, this first logbook was created in two hours (it would now take 30 mins !)



30-09-2008	FillingModes	Uniform	Uniform procedure with longitudinal and vertical transverse feedback.	Chazot Ledrappier
16-09-2008	FillingModes	4 * 10 mA	Procedure 4 times 10mA Run 2008-4	Jodar
11-09-2008	Meeting	Operators meeting	Operator's meeting held on 11/09/2008	Chiappinelli
03-09-2008	Documentation	Diagnostics	What to do in case of connection problem with D4 and D19 purity measurement devices ?	Robinson
02-09-2008	Forms	Miscellaneous	Accelerators startup protocol. Check list	Hardy
28-08-2008	Meeting	Operators meeting	Operator's meeting held on 28/08/2008.	Ledrappier
27-08-2008	FillingModes	16bunch	16 bunch run 2008-4	GARNODON
25-08-2008	Procedures	Magnets	A new and slightly modified procedure to open a SR quadrupole has been saved today to check the continuity of the coils loop of the quadrupole before tagging IN this device.	roussely
14-08-2008	Meeting	Operators meeting	Operator's meeting held on 14/08/2008.	Garnodon
12-08-2008	Procedures	Diagnostics,Vacuu	Entered by Hardy:What to do if a stripline or shaker thermocouple reaches alarm level	ROBINSON
24-07-2008	Meeting	Operators meeting	Operator's meeting held on 24/07/2008.	Niclas
10-07-2008	Meeting	Operators meeting	Operator's meeting held on 10/07/2008.	Ledrappier
24-06-2008	FillingModes	7/8 + 1	RUN 2008_3 Change cavities' configuration...."with cav 5 in passive mode"	
09-06-2008	FillingModes	7/8 + 1	7/8 +1 procedure for Run 2008-3	

Second test ! A logbook to gather technical information within a group.

In the Power Supply Group, a record of who has done what on which equipment can be retrieved in a second, years later !

A different colour is triggered depending on the option chosen in a field (« event » = « fault » here → red)

Add: New Edit: Filter: New Edit 0 days Print Form Options Configure Help Exit logged in as **hardy**

User Name : falaise
Area : SRDC
Equipment : Hazemeyer
Mode : USM
Event : FAULT
Email to :
Images (no attachment)

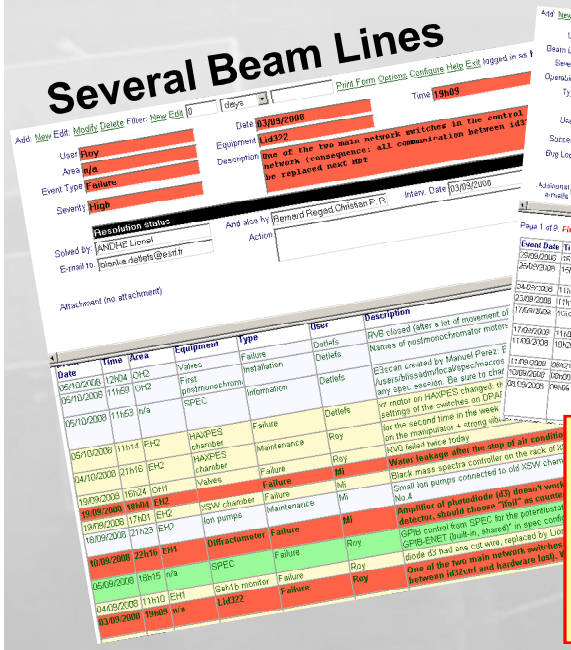
Event Date : 21/07/2008 Event Time : 09h34
Message : Suite au creux réseau (voir CTRM LogBook), QD3 est en défaut "Active filter fuse". Sur place, un seul fusible est percuté. On redemare sans ce fusible.
La réparation est prévue lors des interventions de demain matin.

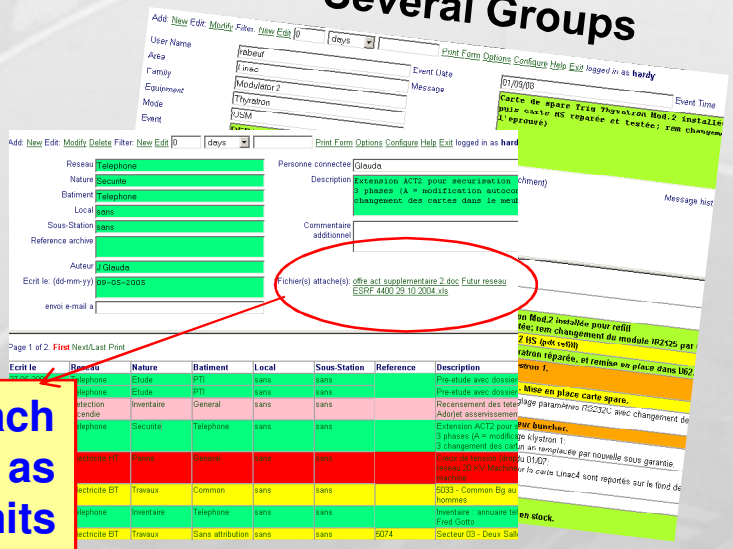
Attachment : (no attachment)
Log History : (no attachment)

28/07/2008	16h03	None	Blank	Blank	Compte rendu du 17/07/2008	INFORMATION	bulstra
22/07/2008	16h30	MDT	SRDC	Hazemeyer	L'alim QD3 est de retour sur ces aimants (voir message de Steph du 22/07). Merci SRUPS !	INFORMATION	falaise
22/07/2008	14h00	MDT	SRDC	Hazemeyer	Reparation du ballast de QD3 (voir message du 21/07/08). Le fusible percute (F107) et les 6 transistors 15024 du 4ieme module (en partant du haut) sont changes. Lors des tests de remise en route, je m'apercois que la resistance 1K ohm du driver du 2ieme bloc (en partant du haut) est noire. Le test des transistors 15025 correspondants montre qu'ils sont en court-circuit collecteur-base. Echange des 6 transistors 15025. Mise en marche de l'alim avec 100 A de sortie et test que tous les transistors (+ et -) du ballast debitent --> OK.	REPARATION	falaise
22/07/2008	11h11	MDT	Blank	Hazemeyer	S. LAGARDE: the "faulty" earth link with vigitherm on S6/C25 is due to the lost kapton. A new one has been placed and a high voltage insulation is performed on S6 family (220Kohms under 1KV). QD3 magnets are switched on SRUPS due to lake of time intervention. A switching to normal configuration could be planned by Opertors this afternoon after Falaise P. confirmation.	REPARATION	lagarde
21/07/2008	09h34	USM	SRDC	Hazemeyer	Suite au creux réseau (voir CTRM LogBook), QD3 est en défaut "Active filter fuse". Sur place, un seul fusible est percuté. On redemare sans ce fusible. La réparation est prévue lors des interventions de demain matin.	FAULT	falaise
20/07/2008	18h09	USM	SRDC	Hazemeyer	Alim S6 en "Earth fault". Plusieurs démarrage donne le meme défaut. Le faisceau est toujours présent mais avec une durée de vie de quelques heures ! Le faisceau est tué pour accéder à la grille de commutation. Depuis la grille, il y a 24 Vdc entre la terre et la chaine des aimants. En mettant hors tension les racks "Magnet & Vacuum cooling" dans la galerie technique, on trouve que le défaut se trouve en cellule 25 (plus de 24 V dès que le rack est arreté). En entrant dans SRTU, on trouve le vigitherm en défaut (en haut face à nous). Ce vigitherm est remplacé par un strap dans la chaine d'interlock. Nota: Ce sextupole revient de réparation (voir message du 03/06/08) !	FAULT	falaise
11/07/2008	16h00	USM	SRDC	Bruker	Suite au message du 09/07/08 dans CTRM LogBook, "B. Ledrappier: Important difference beetween set and read values on CV1. JM. Koch is informed.", dépannage de CV1 (TL2). La mesure du shunt (TP11A), donne la bonne valeur du courant de sortie; tandis qu'en sortie de l'ampli opérationel U62 (TP8B) la tension n'est plus bonne	REPARATION	falaise

Electronic Logbooks at ESRF

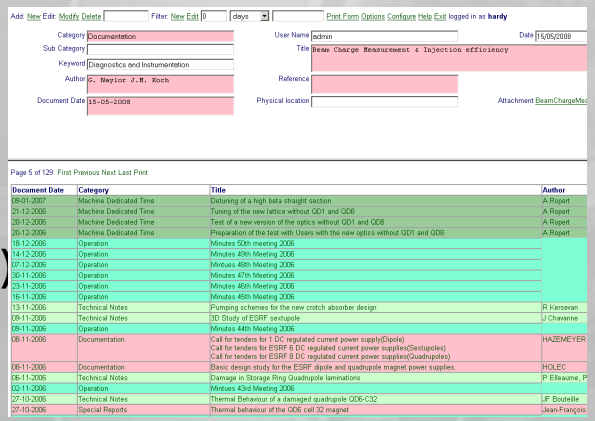
And … many other examples ! The introduction of the JLogBook at ESRF was such a success that most groups wanted their own logbook !





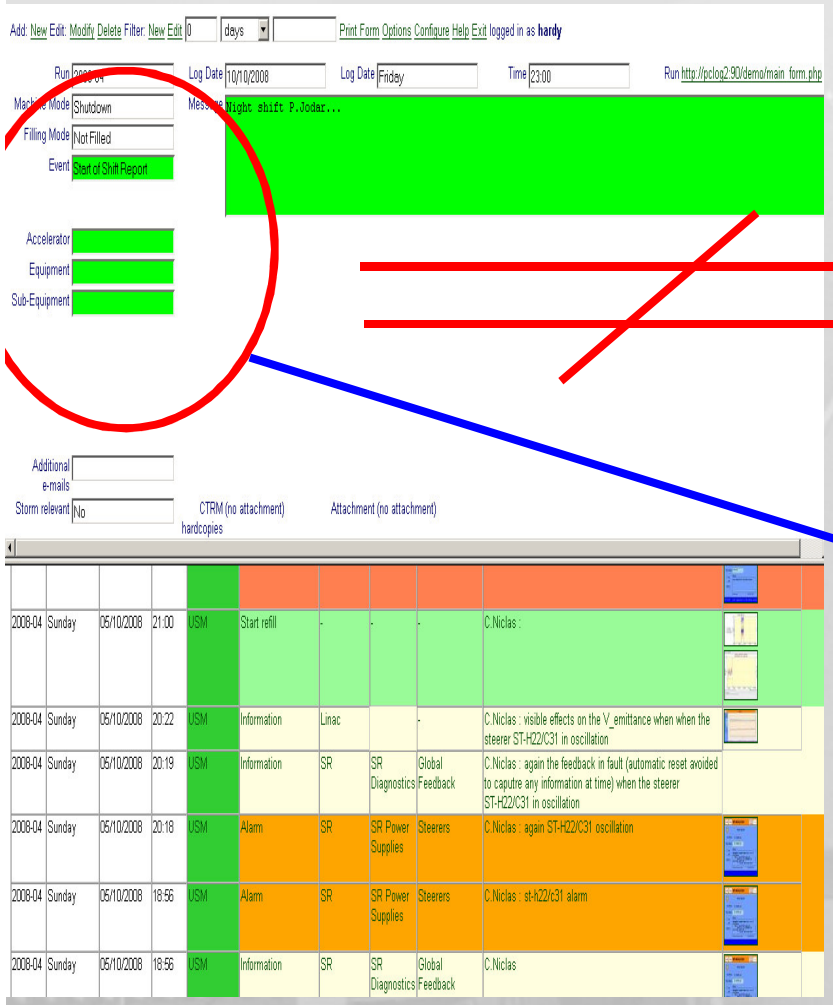
Attached documents : Attach WHAT YOU WANT and as many as you want. No limits on size or extension files !

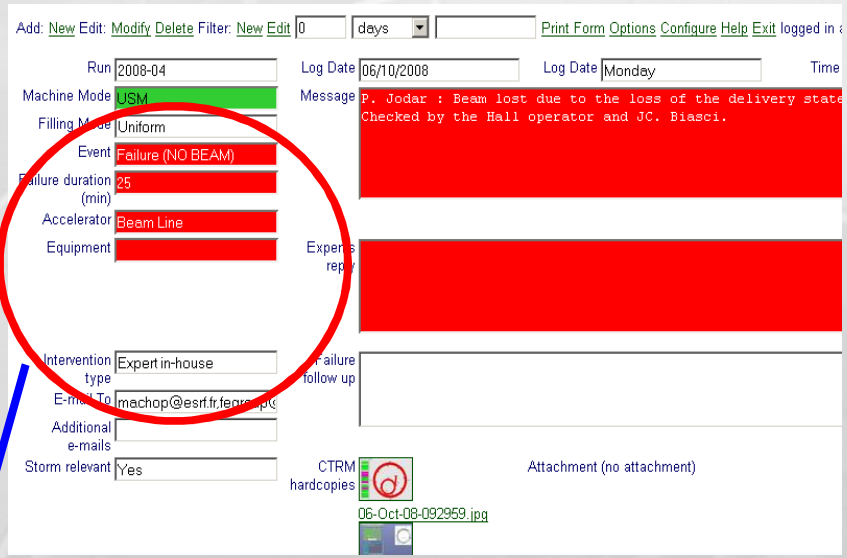
The Accelerator Division to store ALL technical notes / lectures / conf. / papers / minutes of meetings / etc (3000 docs)



➔ Versatility is the great advantage of this e-logbook software which can be adapted to ANY need !

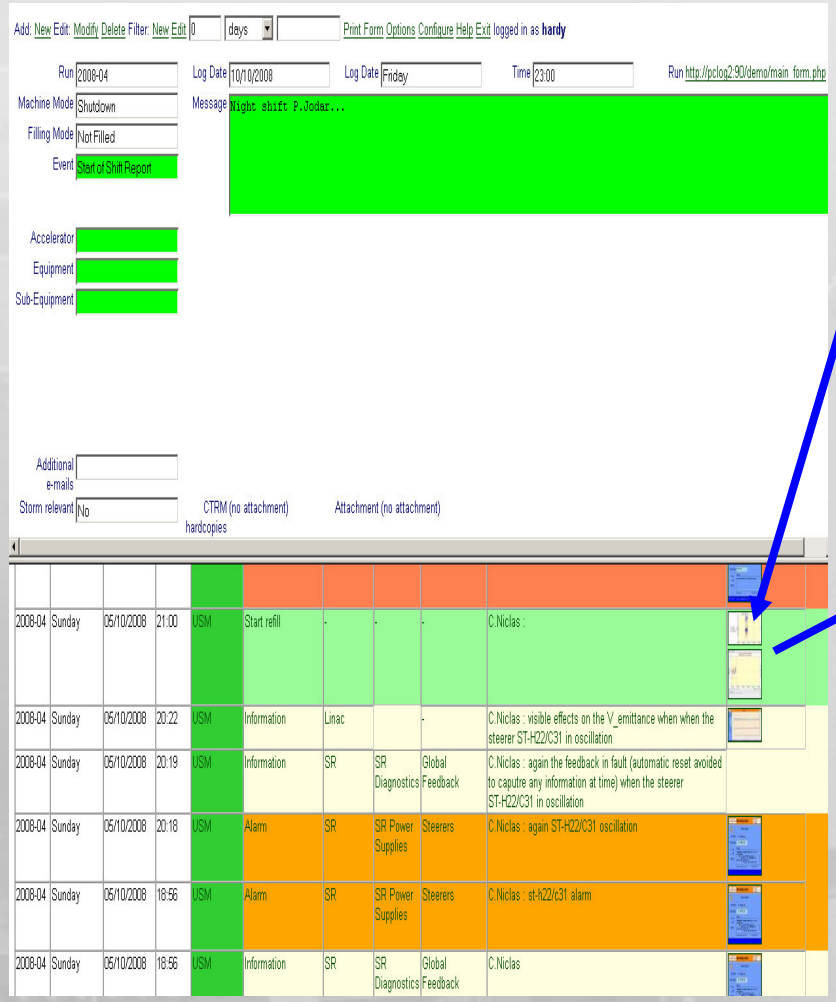
2006, the final step: the Control Room e-logbook including all sophisticated functionalities !



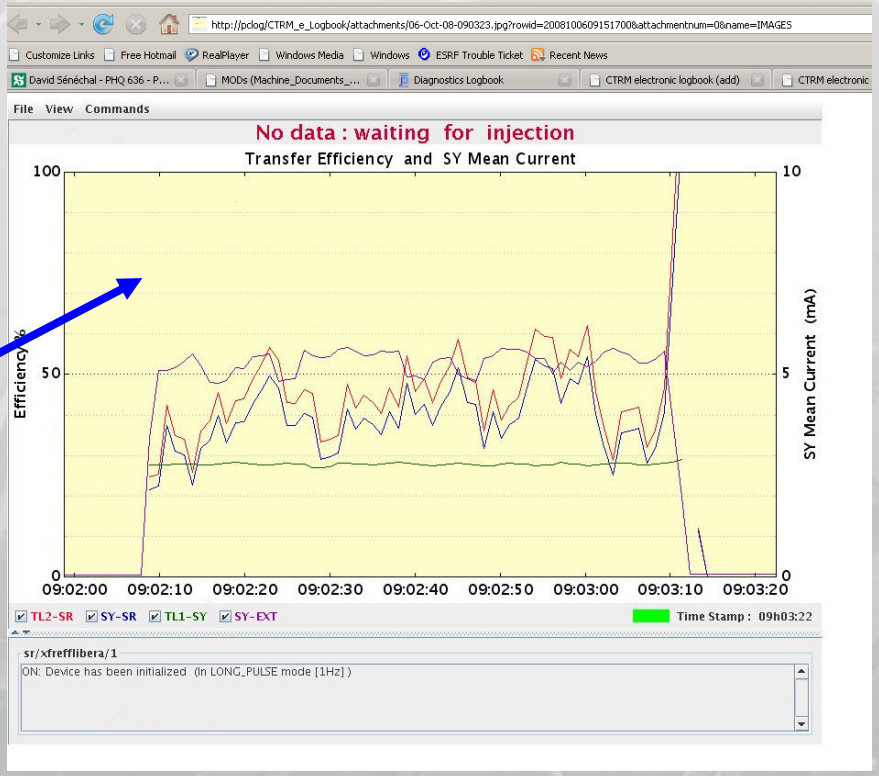


- **DYNAMIC FIELDS: ONLY relevant fields will appear, depending on the option chosen in a parent field: Users are not bothered with irrelevant fields !**

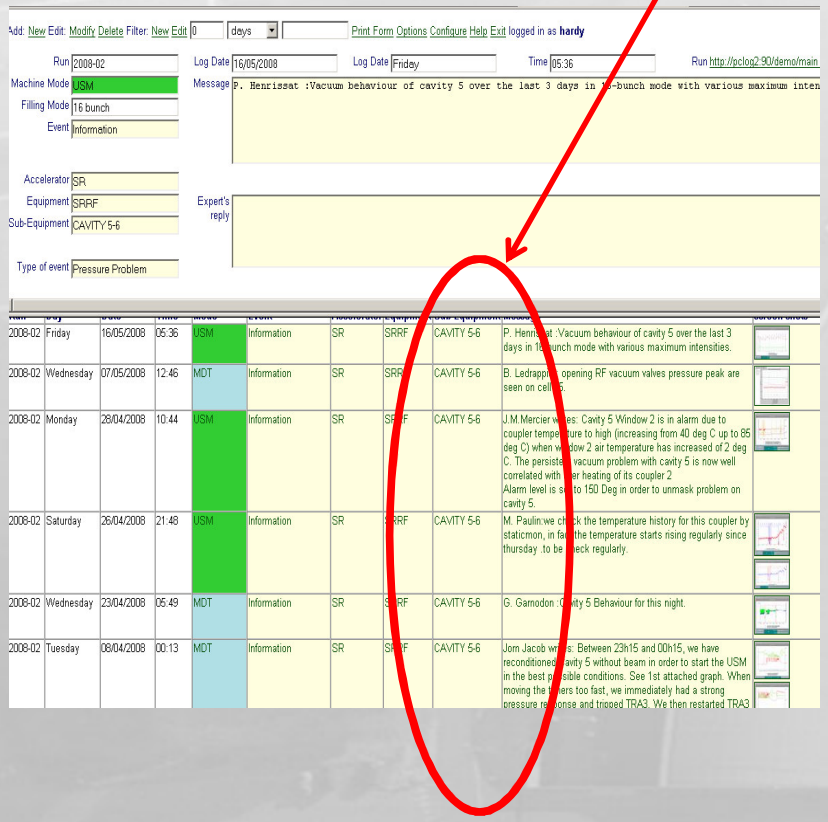
Electronic Logbooks at ESRF



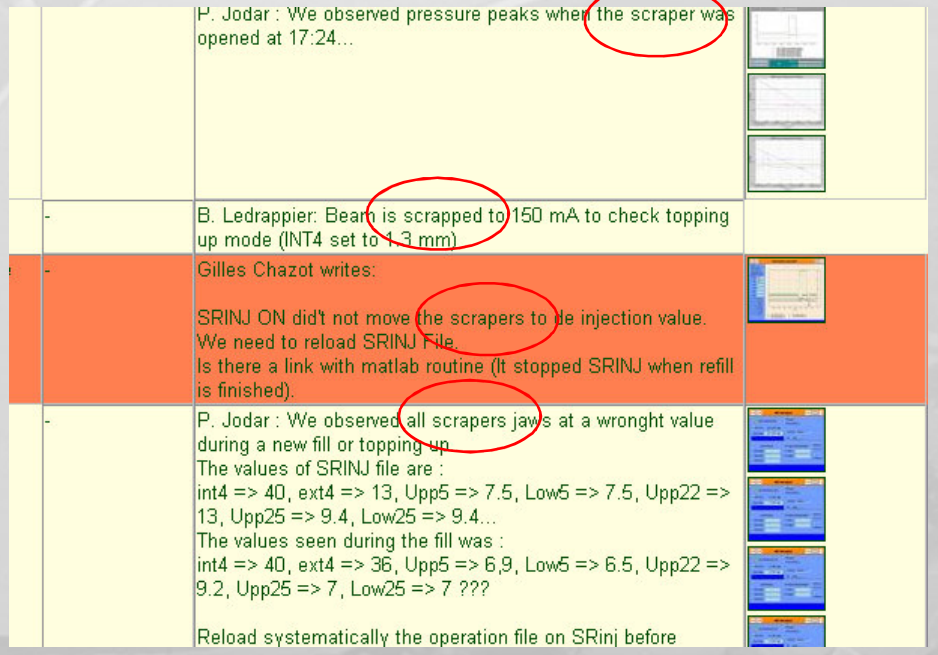
• **Screenshots**: Attach as many as you want in the same log. They will appear as clickable thumbnails.



• **Powerful filters: Retrieve anything which has been logged concerning « Cavity 5 » for n years**



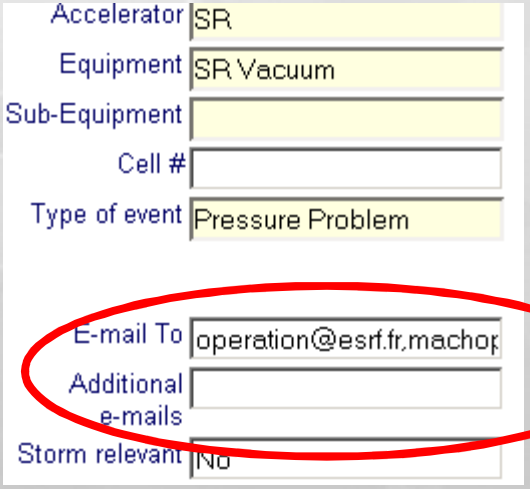
Or retrieve all logs where a part of the word 'scraper' has been mentionned …



Or any tricky combination of filters you want !

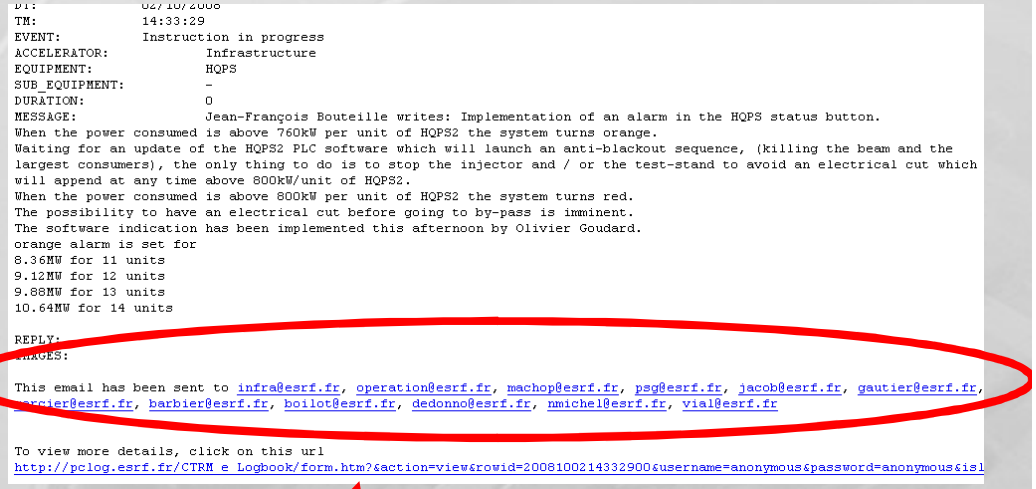
Electronic Logbooks at ESRF

• **Powerful mailing system**: The operator can decide to mail a log to one or several persons (or predefined groups of persons)



Or the 'designer' decides that an email of the log will be sent automatically to: (examples !)

- **Operation managers for all failures**
- **RF engineer for all RF failures**
- **'J. Meyer' for all computing failures which occur on the beamline ID14 only, etc .**



```
DT:             02/10/2008
TM:             14:33:29
EVENT:          Instruction in progress
ACCELERATOR:            Infrastructure
EQUIPMENT:              HQPS
SUB_EQUIPMENT:          -
DURATION:               0
MESSAGE:                Jean-François Bouteille writes: Implementation of an alarm in the HQPS status button.
When the power consumed is above 760kW per unit of HQPS2 the system turns orange.
Waiting for an update of the HQPS2 PLC software which will launch an anti-blackout sequence, (killing the beam and the
largest consumers), the only thing to do is to stop the injector and / or the test-stand to avoid an electrical cut which
will append at any time above 800kW/unit of HQPS2.
When the power consumed is above 800kW per unit of HQPS2 the system turns red.
The possibility to have an electrical cut before going to by-pass is imminent.
The software indication has been implemented this afternoon by Olivier Goudard.
orange alarm is set for
8.36MW for 11 units
9.12MW for 12 units
9.88MW for 13 units
10.64MW for 14 units

REPLY:
IMAGES:

This email has been sent to infra@esrf.fr, operation@esrf.fr, machop@esrf.fr, psg@esrf.fr, jacob@esrf.fr, gautier@esrf.fr,
mercier@esrf.fr, barbier@esrf.fr, boilot@esrf.fr, dedonno@esrf.fr, nmichel@esrf.fr, vial@esrf.fr


To view more details, click on this url
http://pclog.esrf.fr/CTRM e Logbook/form.htm?&action=view&rowid=20081002143329O0&username=anonymous&password=anonymous&isl
```

Just click on the link to access the log as a 'guest' (no need to login / use password)

Electronic Logbooks at ESRF

• **Powerful USER RIGHTS:**

All Users can be attributed extremely powerful User rights at a glance (many more combinations than in the most expensive industrial software applications !)

Examples:

- Operators are forced to read the latest instructions in progress when they login (automatic filter on login) but not other people' s.

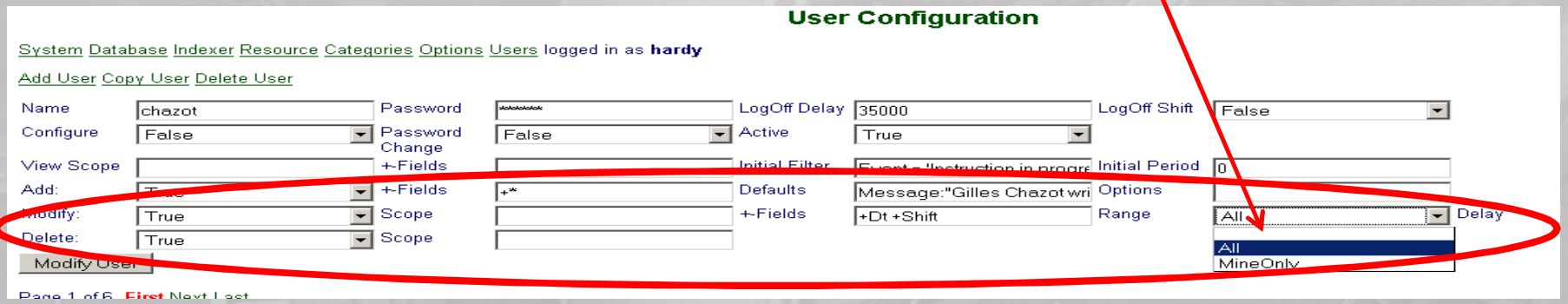
- User 'alpha' can access logbooks for which only he is authorized.

- User 'alpha' has or doesn't have the right to access some fields

- User 'alpha' has or doesn't have the right to access some options in some authorized fields

- User 'alpha' can modify / delete what he or others have entered,

- Etc without any limits !



Electronic Logbooks at ESRF

ESRF operators now consider that a kind of « ideal » Control Room logbook has been achieved. The function most appreciated by the operators is the powerful filter possibility which allows information on any sub-equipment to be retrieved in a second and also the attachment of screenshots in a click.

But … it would be ideal if …

- **All logbooks could be organized in tabs / sub-tabs , etc**
- **A record in a logbook could be Web-linked with another record of another logbook**
  - **Ex: link a failure of in the 'Control Room' logbook with a procedure in the 'Procedure' logbook.**
- **A record could contain sub-record(s). Ex: after a failure, track everything which was done concerning THAT failure.**
- **An interface could be done with our TANGO control system in order to:**
  - **trigger automatic logs every 8 hours (intensity / lifetime / emittances / etc)**
  - **trigger « on-event » data. Ex: IF lifetime drops by 30 % ➔ create a log with this and that parameter and attach a graph of the RF voltage vs time (ex !)**

Here comes the latest logbook generation « J5 » out since 2008

Electronic Logbooks at ESRF

5. The JLogBook version 5 (j5) was released in 2007-2008.

- **Improved organization in the case of many logbooks**

J4 (until 2007)

Logout logged in as **hardy**

CTRM e Logbook

ID32 Logbook

CTRM Documents

Linac

ALGE Logbook

Injection

Electrotechnics

MX Logbook

Machine Documents Database

Vacuum Documents Database

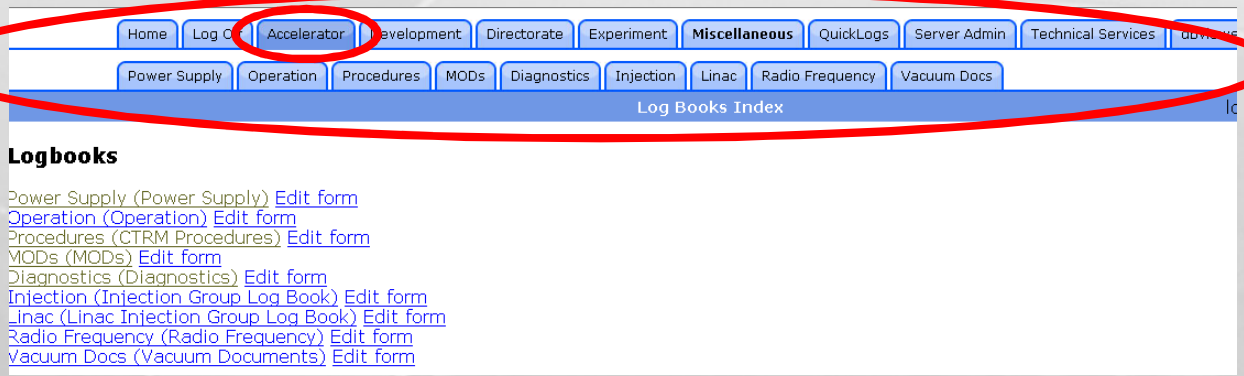
Safety Logbook

Front End logbook

Phototheque

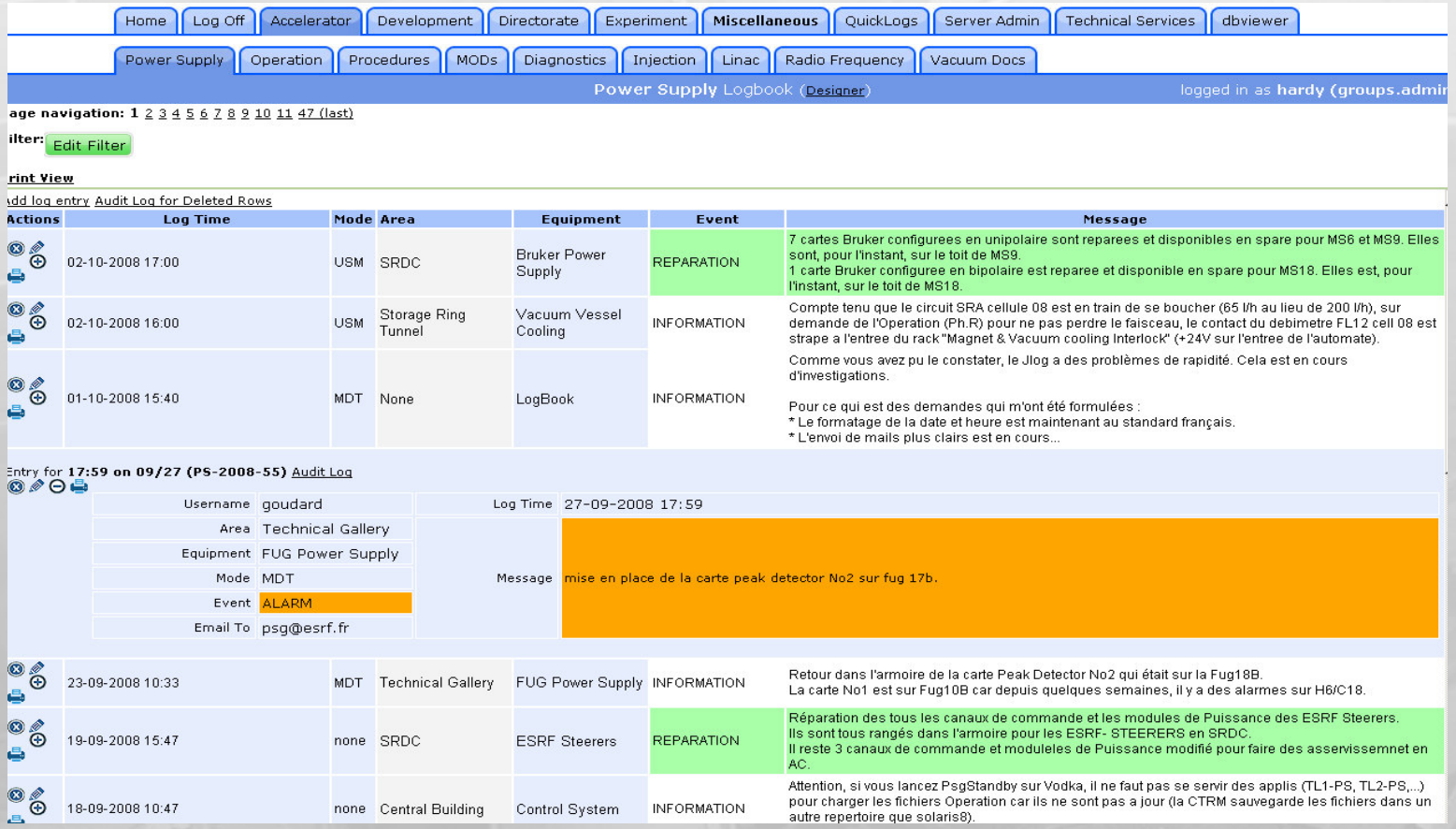
Power Supply

J5 (2007 onwards)



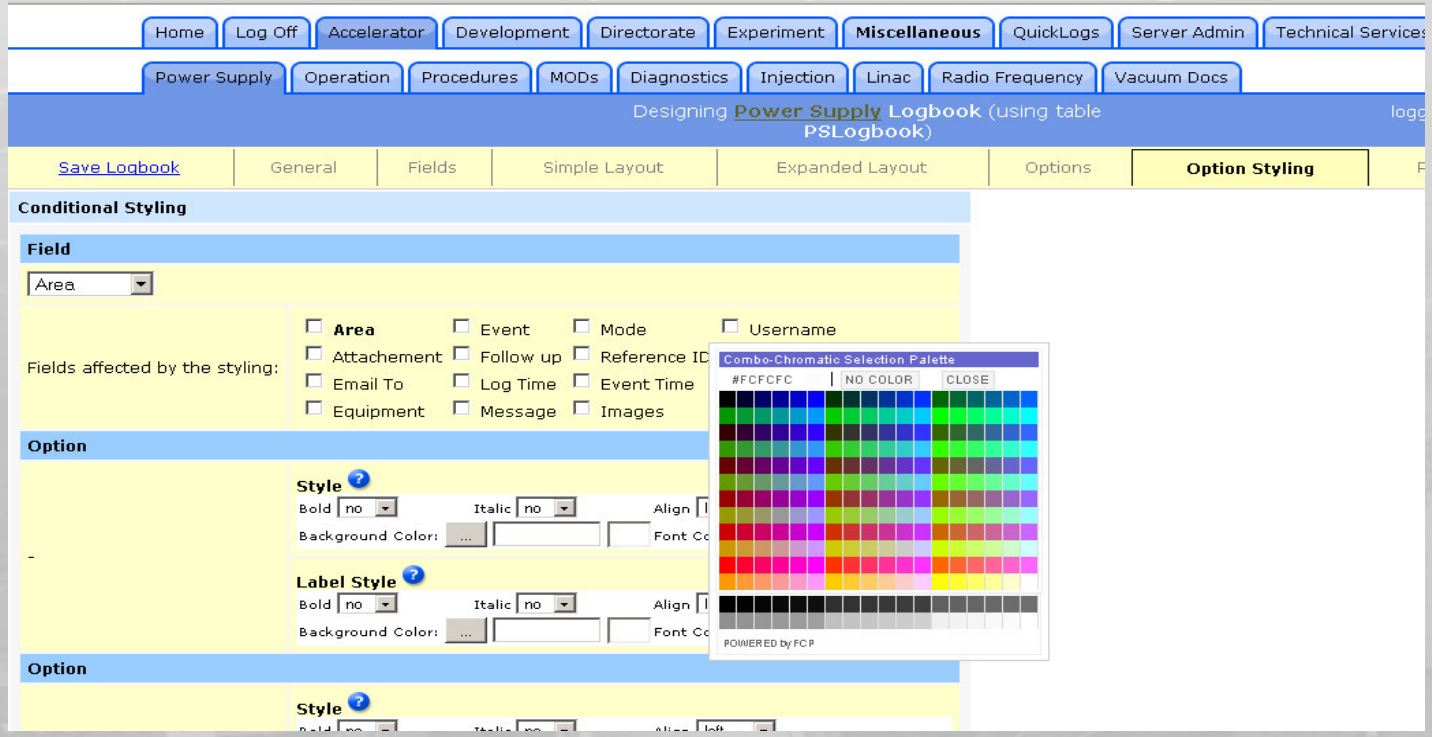
Electronic Logbooks at ESRF

- **Improved User interface**



Electronic Logbooks at ESRF

- An 'even-easier' interface for designers and administrators !
- And a possibility to clone logbooks which are very identical or similar (ex: it takes a few minutes to configure a logbook for a beamline which is very similar to another one … !)



Electronic Logbooks at ESRF

- **Sub-Logs are possible**

Entry for **22:09 on 08/27** Audit Log

Dept	Monomer	Round Name	South East Round Copy	Status	Expired	Due Date	2008-08-27 22:30
Description	Covers the area south of the tanks up to the storage Dam						
Comment / Followup							
Supervisor Comment							

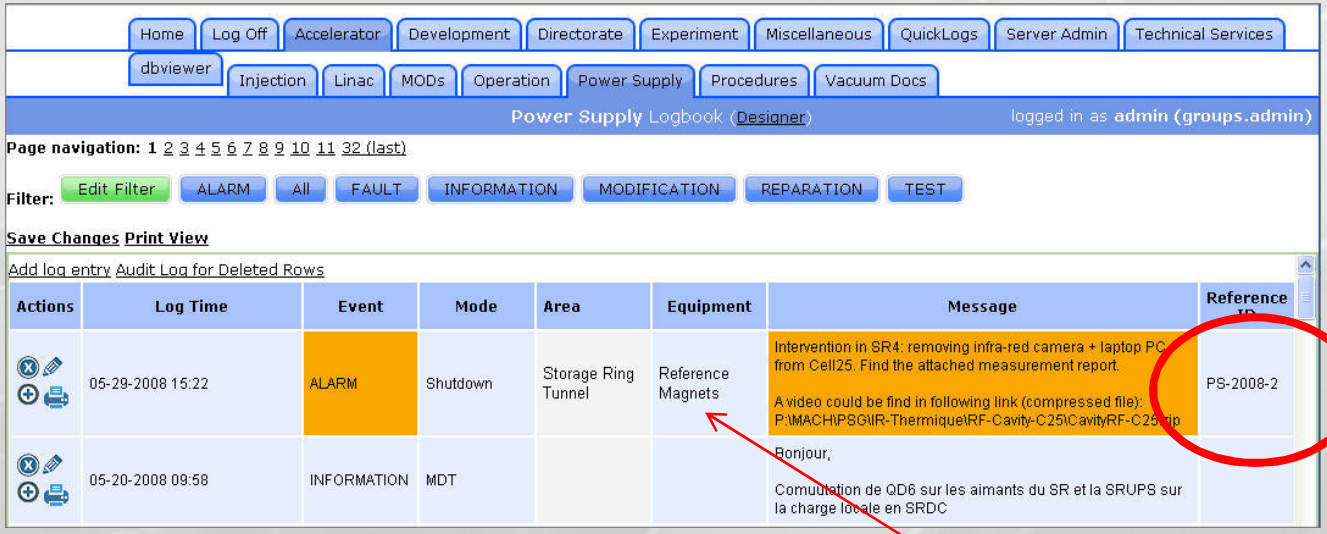
Sublogs associated with the main log

Add log entry Audit Log for Deleted Rows

Actions	Task Date	Task Order	Instruction	Tag Name	Task Value	Comment
	2008-08-27 22:09	1	Measure the value	T101	345	No problems today
	2008-08-27 22:09	2	Choose an option	S102	OK	
	2008-08-27 22:09	3	Select one	J343	Bad	Switch is hot...we need to get this fixed

Electronic Logbooks at ESRF

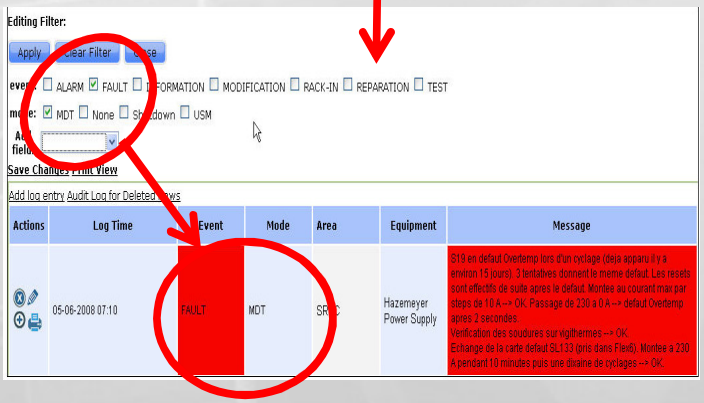
- **'Human readable' IDs can be created automatically at every log**

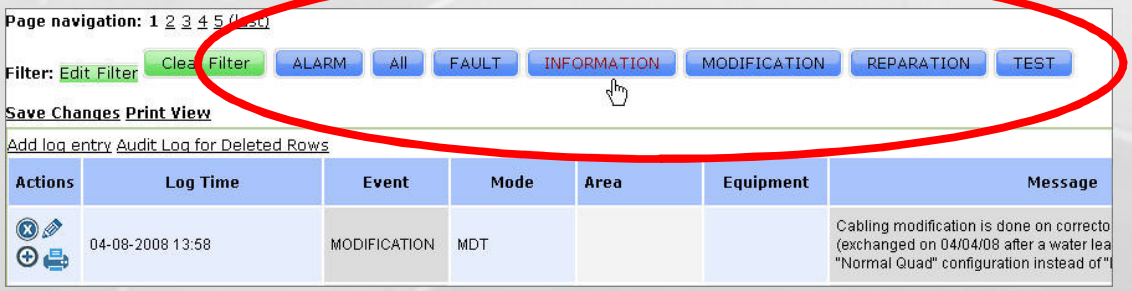


➔In another logbook (ex: control room logbook) where this ID is mentionned in a Weblink, clicking on it will open this log of the 'Power Supply logbook'.

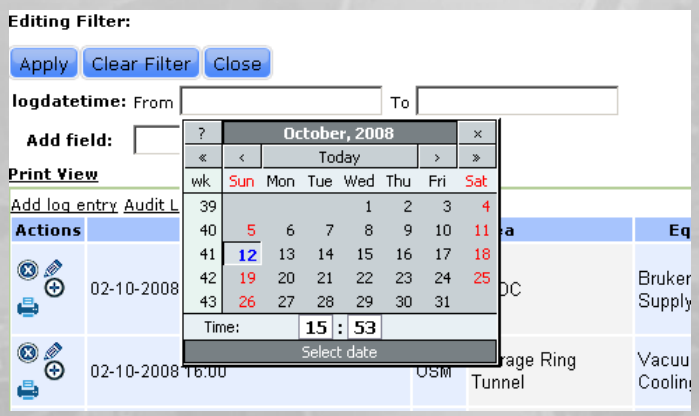
Very useful to link a failure with a procedure written elsewhere for example.

- **Improved filter interface + possibility of predefined filters**





- **The calendar widget avoids all problems of date / time format when recording or filtering !**

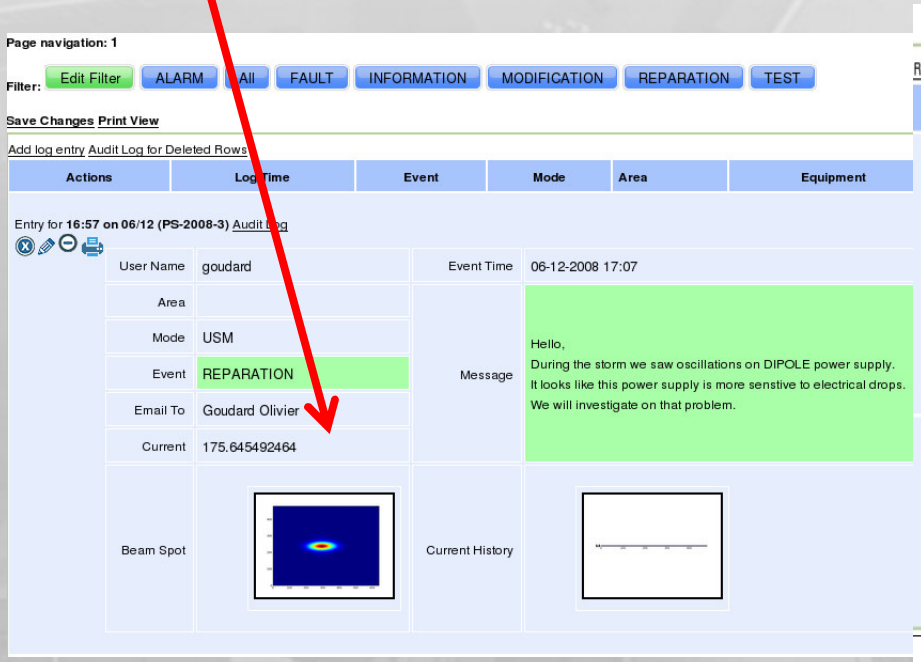


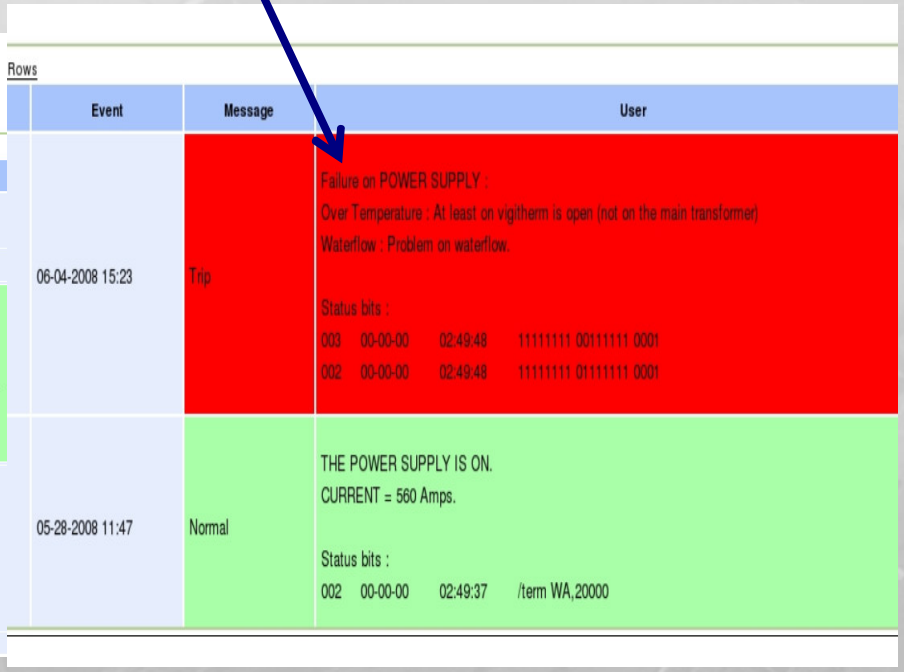
Electronic Logbooks at ESRF

- j5 (as j4) can be connected to any common database (MySQL, Access, PostReg, Oracle, etc)

- And last but not least, the interface to the TANGO control system to catch:

Automatic **or** **on-event data**





Electronic Logbooks at ESRF

But this is the subject of the next talk to be given by David Moore !

6. CONCLUSION

- Four years later, after having chosen to buy a commercial product from a small reactive company, we are fully satisfied with our choice.

- All specifications have been met (and even many more !)

- The price for ALL personalized developments +
  - PERMANENT site licence (+ an indefinite number of Users)

    is ~ equivalent to the price of one engineer/year !...i.e., much cheaper than an in-house development !

- reactive company means :
  - Solutions provided in a few hours (or days if programme development is necessary)
  - Platinium support (24/24 365/365) to help Users
  - They can connect to your system and do the job themselves if you do not feel competent to implement something.

7. Acknowledgements

- St James Software for their excellent and rapid response to our requirements
  - Nick Hurley
  - David Fraser
  - David Moore
  - Don Glass
- ESRF:
  - Olivier Goudard for his dedicated involvement over the last 4 years
  - Jean-Michel Chaize (head of computing software) for his great help and support
  - Gilles Chazot, operator, presently involved in designing beamline logbooks