



**Information And Communication in
Operation At GSI**

Uwe Scheeler

operation department

GSI Helmholtzzentrum Darmstadt

Germany

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Outline:

1. The relevance of communication
2. Rough sketch of GSI operation
3. Involved groups in operation
4. Making information available
5. A platform of communication
6. How we want to improve
7. Conclusion

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1. The relevance of communication :

Transportation of

- information
- directives and guidelines
- motivation

Fundamentals:

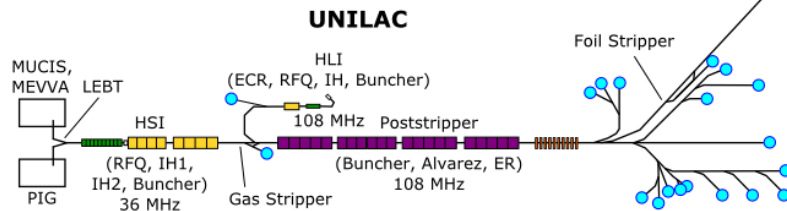
- you need to have contact
- sending and receiving messages
- communication is more than exchanging words
- might be necessary to form a decision

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2.1. GSI accelerators:

UNILAC

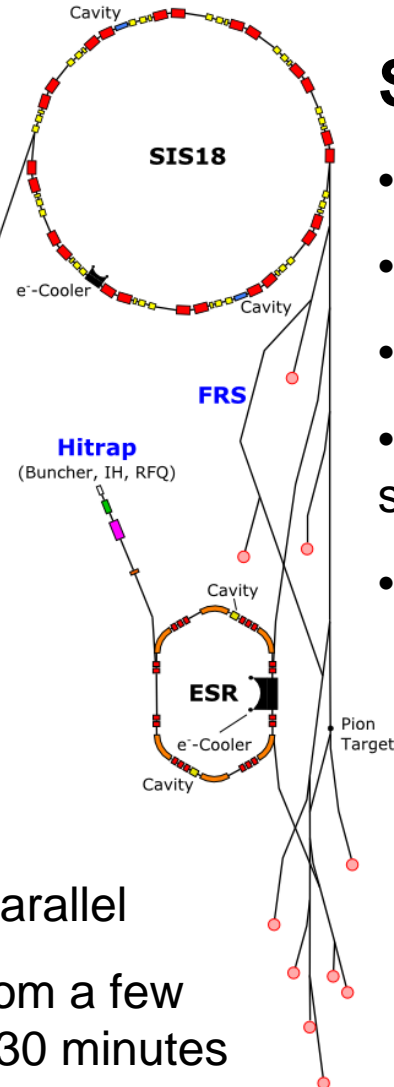
- 50 Hz repetition rate
- 3 ion sources
- 16 experimental caves



0 25 m
A.Bloch-Sp ath, 2011

ESR

- Operation in parallel
- beam pulse from a few seconds up to 30 minutes



SIS18

- max. rigidity 18Tm
- slow extraction
- fast extraction
- beam pulse 1µs-10 sec.
- 10 experimental caves

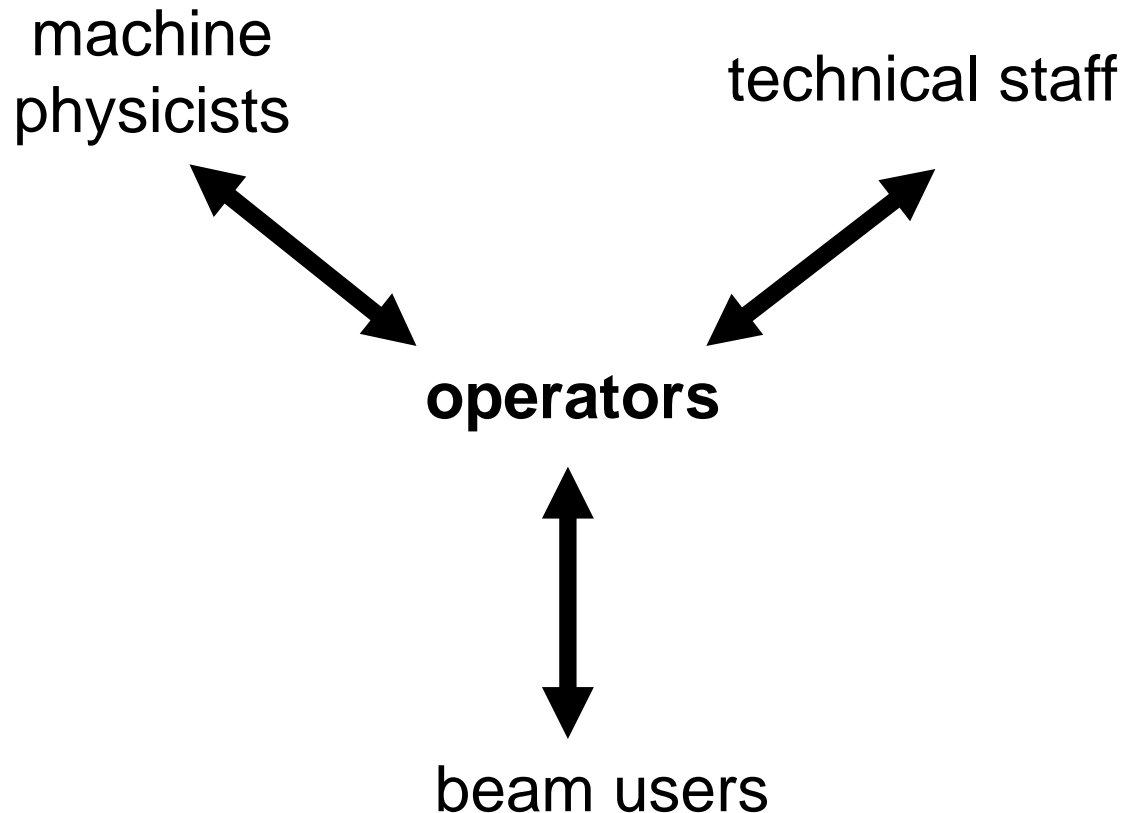
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2.2. GSI operation:

- 3 accelerators: linac, synchrotron, storage ring
- up to 6000 operations hours per year
- 3 operators on shift and about 30 people on call
- about 130 people are involved in the machine operation in general
- up to 6 experiments with 3 isotopes and different energies and intensities can run in parallel

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3. Involved groups :



Operators have 2 tasks concerning communication:

- gather or distribute messages
- be the link between the other groups

They are supported by the operation coordinator to manage these things.

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4. Making information available

- beam time schedule -> request of users
- machine status -> availability of the accelerator
- operation meeting -> report and analysis

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Beam time schedule:

-published in the internet

-contains the sequence of approved beam requests of the experiments

-daily meeting for discussing and organizing details

-protocol for the shift crews is provided

2 / 2012					August 2012										Schedule as of 27-Jun-2012															
Week 31					Week 32					Week 33					Week 34					Week 35										
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
U258, Düllmann/Düllmann, 50Ti(PIG), 5.5-6.5 MeV/u, 1-2 particle-microAmps in X8, 50 Hz / >= 5 ms, X8 TASCA																														
U277, Heinz/Heinz, 238U28+, 6 MeV/u, 1 mA, 1 Hz, no, Z7										a)										U272, Rosmej, O/Rosmej, O., Ti, 4-7 MeV/u, 100pnA, 5Hz 10-15 min/2hours, no, Z6										
UBIO, Friedrich/Scholz, Ti, 11.4 MeV/u, einige					UMAT, Severin/Bender, Ti, 4.8, 5 ms, 5Hz, M3										UBIO, Friedrich/Scholz, U, 11.4 MeV/u, einige TnA, 1 Hz, M-branch					b)										
S411, Dendooven/Purushothaman, 238U, 1000 MeV/u, 1000 /s, slow extraction					c)					S388, Mukha/Litvinov, 38Ar (MUCIS, enriched), 1000 MeV/u, 3e10/spill, 4 s extraction, EPS					d)					S415, Tabei/Simon, Kelic, 238U MEVVA, 1000 MeV/u, 1E9 /spill, 10 s extr., EPS/MTC					SBIO, Bert/Scholz, 12C EZR, 100-600, 1e3 - 1e8/spill, therapy conditions (Cave M), HTA/HTM					
SMAT, Schuster/Trautmann, 238U, 150-250 MeV/u, 5e8/spill, 1s extraction																														
E090, Hagmann/hagmann, 238U92+, 50-100 AMeV, einige 10**8 ESR										E089, Buesmann/Winters, C3+, 122 MeV/u, 100 micro Ampere, ESR					E090, Hagmann/hagmann, U92+, 50-100 AMeV, einige 10**8, ESR															

- a) U252, Roth/Blazevic, 12C EZR, 3,6 MeV/u, 2 µA, Z6
- b) UBIO, Friedrich/Scholz, C, 11.4 MeV/u, 1 Hz, M-branch
- c) SESA, Scholz/Scholz, Ti, 1 GeV/u, 1e8 / spill, slow (5s) extraction, HTA
- d) SESA, Scholz/Scholz, Ti, 1 GeV/u, 1e8 / spill, slow (5s) extraction, HTA
- e) S401, Heuser/Kis, 84Kr Mucis, 1.4 GeV/u, 1e9/spill, long extraction, 10 s, HTB

Burkhard Kolb, Phone +49-6159-71 2667, E-Mail: beamtime@gsi.de

4 rows UNILAC
3 rows SIS
1 row ESR

27.06.12 11:09

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Electronic Log Book

Events / colors:

Ion source serv.: brown

Set up: yellow

Beam on target: green

Breakdown: red

Standby: light blue

Two experiments:

Alles (ohne alte Mängel) >> aufsteigend

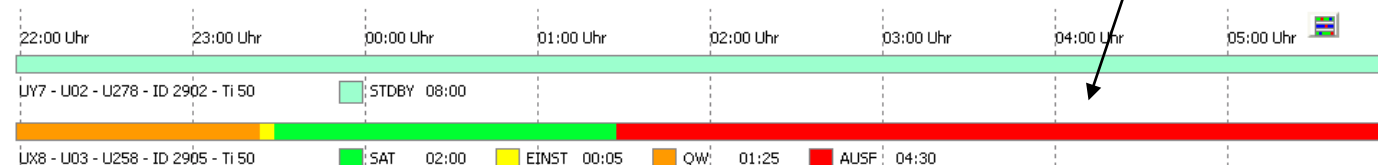
Nachtschicht So 17.06.12

Start Ende	Experimente	Ereignis Gerät	Info	ID	
17.06.2012 23:25 17.06.2012 23:30	UX8	Einstellung - Experiment	Kontrolle der Gitterbilder und der Energie	19441	[edit] [print] [share] [status]
18.06.2012 01:30 20.06.2012 11:05	UX8	Ausfall - Vakuum/Strukturen UA2BA2A, UA2BB5, UA2BA2B externes Interlock	Druckmessung UA2VW1 zeigt $1,81 \cdot 10^{-5} \Rightarrow$ RB	19442	[edit] [print] [share] [status]

Listing of details for the breakdown event

- 18.06.2012 01:45 Druckmessung
- 18.06.2012 02:00 Kühlaggregat für die Pumpen läuft. Zugang in den UNILAC-Tunnel nötig => RB Sist + 2. Vakuum-RB
- 18.06.2012 02:20 Das Vakuum wird schlechter => Druckmessung
- 18.06.2012 03:00 UNILAC-Tunnel wird geöffnet
- 18.06.2012 03:50 Im Vorvakuum der Driftröhren ist Kühlwasser. => RB-UNILAC
- 18.06.2012 04:00 RB-EET zwecks Freischaltung gerufen.
- 18.06.2012 04:05 Die Fehlersuche kann noch mehrere Stunden andauern. => PIG-Quelle abgefahren
- 18.06.2012 10:45 Einkoppelschleife von UA2BA2A defekt
- 18.06.2012 11:40 Alle Magnete ausgeschaltet
- 18.06.2012 17:00 Schleife getauscht und es wird angepumpt
- 19.06.2012 07:30 Zuschaltung Ionengerterpumpen
- 19.06.2012 11:30 Unilac-Tunnel wird geschlossen
- 19.06.2012 13:05 Freischaltung für HF und Magnetnetzgeräte aufgehoben
- 19.06.2012 16:50 HSI, A2A & A2B auf Rechner. Pulslänge (3ms) und Amplituden über Nacht so lassen.
- 20.06.2012 09:50 Amplitude von UA2BA2A ist auf Sollpegel (4,19V). Pulslänge ist noch auf 3ms begrenzt. PIG-Quelle wird angefahren
- 20.06.2012 11:45 Pulslänge auf 5ms gestellt

major breakdown, which lasts 2 days



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Operation meeting:

- every Wednesday morning meet the technical staff, machine physicists, beam time coordinator, operation coordinator
- long term survey of the repair technical problems
- reports from all accelerators about operation of the last 7 days
- report of the experiments
- > possibility to discuss all operation events
- > analysis of break downs and fails
- > decisions for service breaks and performance improvements

Keep it as short as possible and make decisions as fast as possible.

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5.1 A platform of communication :

- Main Control Room

Beam setup for users provides the opportunity to learn from each other.



Relocate noisy discussions to a separated corner.

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5.2 A platform of communication :

Main Control Room and visitors

- relation to the public is very important, that's why the GSI- MCR is part of the visitor tour
- operators sometimes felt disturbed by the visitor groups and argued about the poor explanation of their work
- they demand an announcement of each group by the tour guides, this is done by a simple phone call
- now sometimes operators join the presentation and support the tour guide with interesting information

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6. How we want to improve:

- control of the information flow (beam time scheduling)
- ask for explanation to assure understanding (beam set up)
- use official nomenclatures (break down)
- explain decisions (daily work tasks)

Instead of complaining about missing information – provide information!

7. Conclusion

- distribute information
- organize f2f contact between the groups
- talk in one language, establish moderation
- care about the people who are not involved in discussions/
meetings

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Thank you for your attention!

Further information:

email: u.scheeler@gsi.de

web: www.gsi.de

