Performing and organizing Maintenance Days and Shutdown Periods at FLASH.

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Machine Coordination

1 Deputy

Scientists

• 1 Machine Coordinator

3 Supporting Machine



FLASH1/FLASH2

 $4.2 - 51 \quad 4 - 90$

<30 - 200

1 – 5

Courtesy of S.Schreiber and K.Honkavaara

headers

Reply Comment

with headers

Show

10 - 5000 $10^{11} - 10^{14}$

 $1 - 500 \quad 1 - 1000$

Abstract:

FLASH is DESY's free-electron laser user facility providing ultra-short femtosecond laser pulses in the EUV and soft-X ray wavelength. FLASH is also a pilot facility for the European XFEL project and a test bed for further research and development for linear collider related superconducting accelerator technologies. Since 2014 the FLASH Linac operates two separate beamlines, FLASH 1 and FLASH 2, in parallel. Currently a third beamline, FLASHforward, is under construction and installation. To keep the accelerator running and to provide time for installation work regularly maintenance and shutdown periods are needed. On behalf of the whole FLASH Coordination team, we describe the organization, the work flow of those periods and the hence resulting difficulties and pending issues.

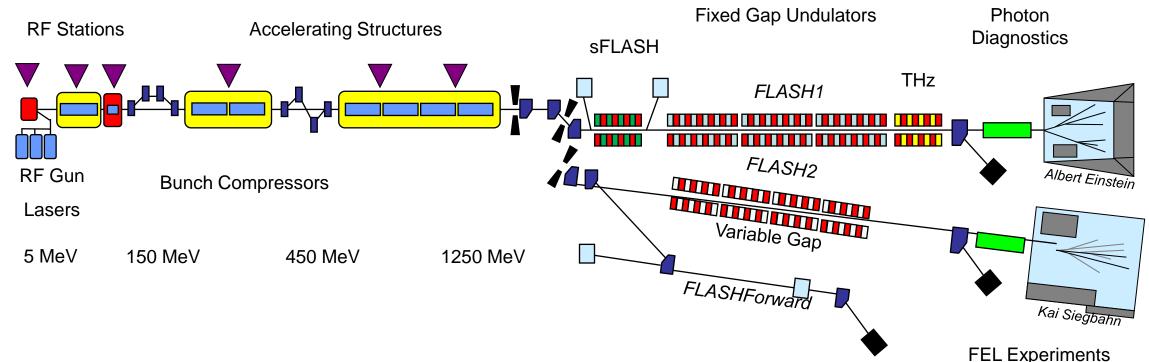
FLASH Organization:

- FLASH Run coordination meetings:
- Every Monday and Thursday: The Monday meeting is allocated to the run summary of the last week, reports User Run: on technical problems and issues, preparation and decisions on a possible 2 Operators (part of the overall shift crew present in maintenance day on Tuesday, and to an outlook of the program of the the DESY control room)
- upcoming week. The Thursday meeting concentrates on issues on the running 1 Machine coordinator available 24/7 experiment and machine performance of the ongoing week. As to the users experiments: - Is the machine behavior/performance OK?
- Are urgent schedule changes required?
- Minutes are available in the weekly overview of the FLASH e-logbook.

FLASH in a nutshell:

FLASH - user facility since 2005

- Single –pass high-gain SASE Free –Electron Laser Photon wavelength range from XUV to soft X-rays Femtosecond range pulses with high brilliance
- A third electron beamline is under construction



[rt #832775] Elogbook Email: vmeacc56 broker

Fri Sep 07 08:33:04 2018: Request 832775 was acted upon.

From: "tc-flash" <tc-flash@desy.de>

To: ("RT at DESY" <bitbucket@desy.de>

Transaction: Ticket created by elog@desy.de

Subject: Elogbook Email: vmeacc56 broker

Oueue: tc-flash

Requestors: elog@desv.de

FEL Radiation Parameters

Average single pulse energy uJ

Wavelength range nm

Pulse duration (FWHM)

Pulses per second

Photons per pulse

Peak power

Beam time allocation Two user calls per vear

> 4500h/a FEL Studies/Photon beamlines and user preparation: 2500h/a **User experiments:** Accelerator R&D: 750h/a

> > Actions ▼

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fl2collpos.xm

1 photon coordinator on users side as local contact

working hours

1 LLRF expert on call available 24/7

1 SASE expert on call available 24/7

• 3 8 hours shifts per day, 24/7

Technical Coordination

1 Technical coordinator available throughout regular

Several on call experts for various subsections

4 Technical Coordinators

Maintenance/Shutdown operation workflow:

(I): Machine Coordination decides if and when a maintenance day is required. Usually maintenance days takes place once a month. Longer shutdown periods, usually up to 4 weeks long, will only be on special needs e.g. machine upgrade, major modifications or requests from external e.g. electricity supplier. Typically these periods takes place twice a year (winter and summer).

(II): At the TC meeting pending issues are discussed resulting in work orders to the machine groups which are announced in the Run coordination Meeting. Requests from the machine groups and beam users concerning maintenance, repair and/or upgrade are communicated in this meeting as well. A detailed schedule is created and passed on to all involved parties.

Exemplary procedure of a common Maintenance day;

- 1. Maintenance day is declared and released in the operation schedule
- 2. Involved parties announces access requests in the e-logbook. ■ 3. Maintenance day starts at 07:00 a.m. with end of the nightshift
- Experiments are informed, beam is blocked
- Radiation measurement and clearance has to be done. This takes about 1 hour to be done.
- At around 08:00 a.m. the accelerator tunnel is opened for all staff members with a work order.
- About noon the TCs collects information about done/undone work

Logbook entry: /TTFelog/data/2017/44/02.11 M

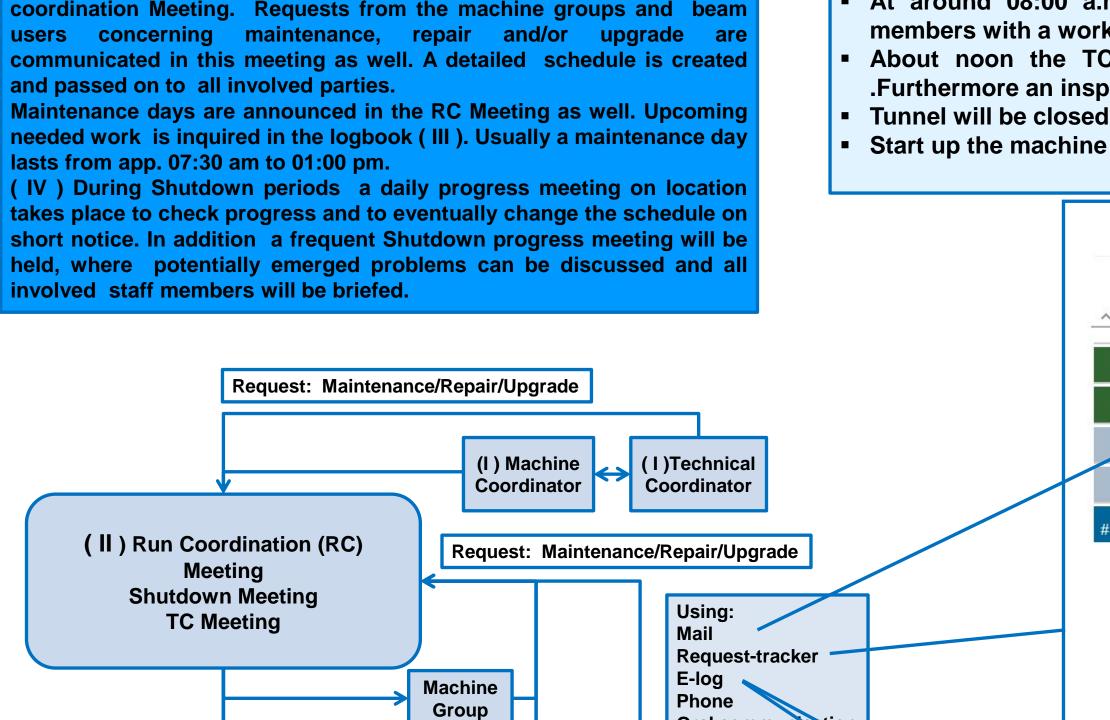
This elogbook entry was sent to following experts:

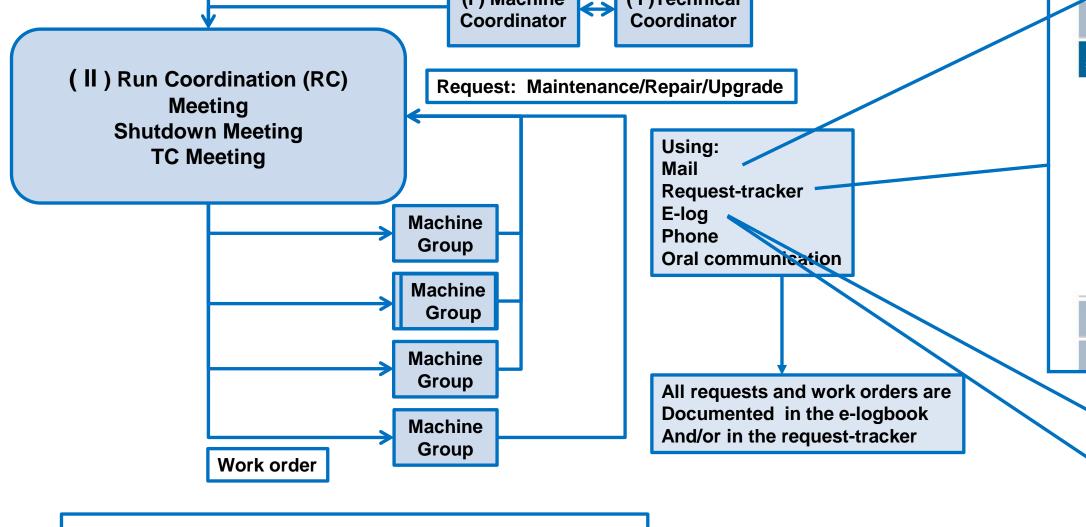
Server give not a response of Value.

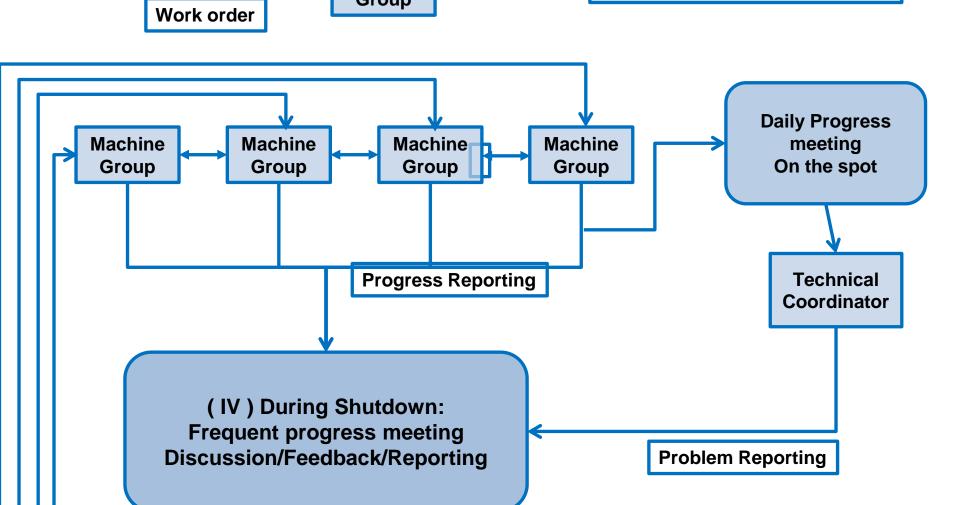
32.11.2017 07:16 FLASH2

DOOCS mailing list

- .Furthermore an inspection round is done by the TCs.
- Tunnel will be closed, Interlocks set



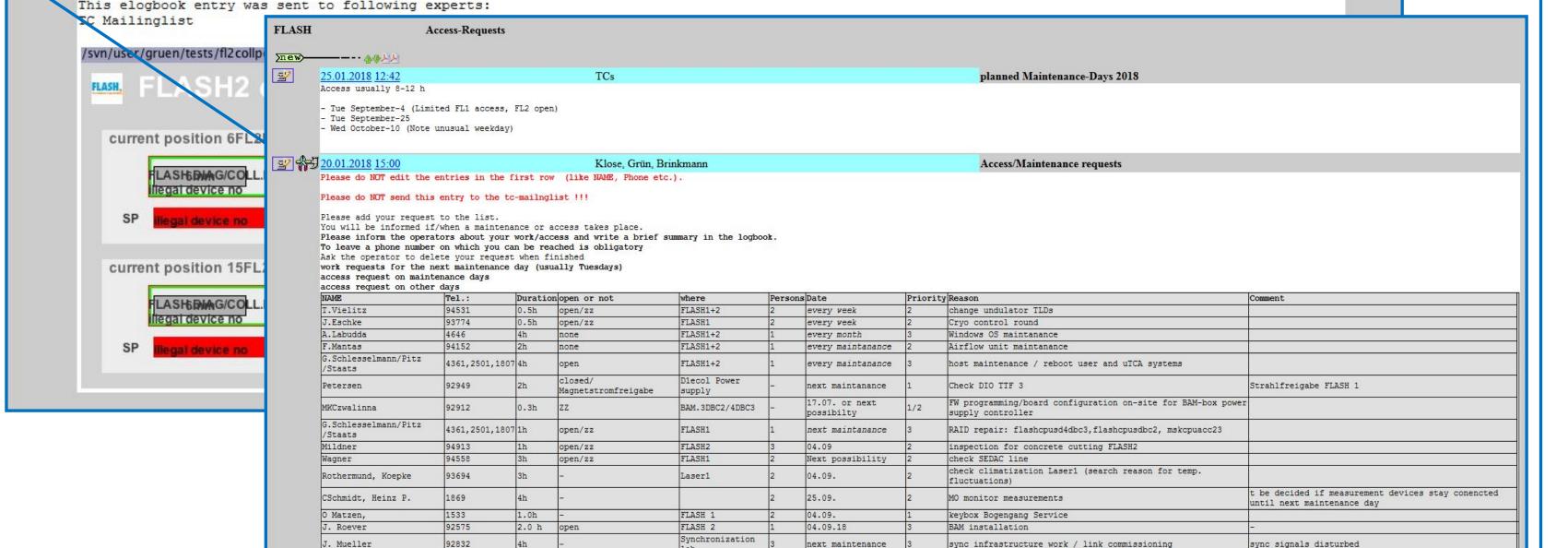




Ticket URL: https://rt-system.desy.de/Ticket/Display.html?id=832775 nen the RB ch 🏲 the CPU vmeacc56 is broken, the hard disk seems to be the problem. I don't know, wether it is possible to repair it now or if it kills the coupler interlocks ?! This elogbook entry was sent to following experts: Goessel 1 TC Mailinglist Sep 09 14 🏲 https://ttfinfo.desy.de/TTFelog/show.jsp?dir=/2018/36/07.09_M&pos=2018-09-07T08:29:41 ASH Tunne 50 2018: F 🏲 Tue Sep 04 04:02:33 2018 Klose, Karsten <karsten.klose@desy.de> - Merged into #831220: Reparatu Tue Sep 04 04:02:33 Klose, Karsten <karsten.klose@desy.de> - Ticket #829800: - Merged into #831220: Reparaturarbeiten Kaltwassersatz Reinraum Geb. 28 (Repair work at the water chiller cleanromm Bldg. 28 31 13:15:30 2018 The RT System itself - Outgoing email recorded ri Aug 31 13:15:30 2018 The RT System itself - Outgoing email recorded Date: Fri, 31 Aug 2018 13:15:29 +0200 (CEST) Subject: Reparaturarbeiten Kaltwassersatz Reinraum Geb. 28 (Repair work at the water chiller cleanromm Bldg. 28 To: "tc-flash" <tc-flash@desy.de> as mentioned before, we plan to repair the water chiller for the cleanroom in Bldg.28 on Sept.04. MKK2 will switch off the VE watersupply at 08:00am. Water will be back at around

Gerdt, Hoffmann, Duhme

This device is connected to the Ethernet switch in Container16, which is broken by now.



Pending issues, difficulties and required solutions:

solutions/improvements/questions Information from machine groups about repair/maintenance sometimes ► Announcing work only possible until a certain strict deadline. But work also has to be done. Will a more rigorous administration comes on (too) short notice. ► The Coordination Team has to collect information in time improve the technical condition of the accelerator over time? Due to DESY regulations a controlled access to the accelerator area ► No more practical solution found up to now. (with door interlock set) has to be a an exception. Therefore the area is open for everyone. ► Unannounced work maybe done or just even started.

Sometimes announced work starts too late,

Feedback

► As a consequence the maintenance day lasts longer as intended.

Planned work sometimes is not accurately described. Even minor changes in the set-up may influence the operation in negative manner.

► Start Up takes more time than expected. Feedback from responsible person about status of completed and/or unfinished work sometimes not given.

► The Coordination Team has to collect information in time

► Maintenance personnel has to observe the announced time duration much more strictly.

► Allocation of certain timeslots for each lot and dedicated temporary access may be a solution. But will maintenance be flexible enough then for reacting on contingencies?

► Urge personnel to use the request-tracker more intensive and oblige involved people to come to meetings before shutdownperiod/maintenance days.

► Urge personnel to use the request-tracker and other communications tools more intensive.

Summary and outlook:

It is obvious that large scale equipment like particle accelerators benefits from maintenance and shutdown periods on a regular basis. Upcoming work of different subsections can be planned in time and non-elective appointments can be well coordinated. If everything is handled in an accurate and straightforward manner, the machine will be in a better condition afterwards. This requires a carefully and accurate planning and a controlled execution and monitoring of announced (and not announced) work. Of course it becomes apparent that operational interaction of many diverse technical groups and involved people not always runs so smoothly as it could. It turns out that an adequate communication is the most important thing while processing such projects. We provide several tools, like logbooks, tracker and meetings, to ensure a proper communication, but we can also see that this not might be sufficient and we have to think about further options to ensure a correct and in time execution.





