Shift Leader Training
Part 1

v.18

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25th February 2015

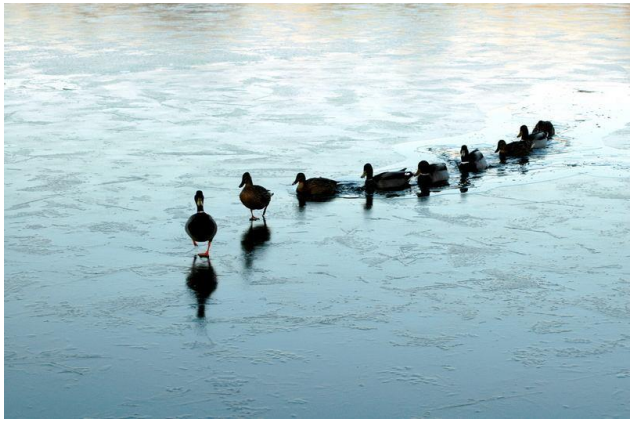
Acknowledgements:
Thilo, Stephanie, etc.

Outline:

- Instructions
- Duties
- Links and Documentation

Main Shift Leader Tasks

- "pre/early" M9: Coordinate sub-detector commissioning & integration
- M9: Lead shift crew to efficiently take data of good quality
  - focus and ensure common sense
  - Make sure people in the control room communicate!
- Implement daily plan
  - combined running
    - Maximize use of combined partition
  - calibrations, tests
    - Follow closely test/debugging of subsytems



- Check basic parameters of operation
  - trigger/DAQ and detector configuration, trigger and output rates, deadtime, detector status, data quality, etc.
- Interact with shifters, experts, run coordinators, system run coord.
- Identify and follow up on problems, failures and alarms
- **Log the progress of ATLAS operation**

Training for Shift Leaders: What's next?

- Complete today's training sessions …
- Ask questions
- Do 2-3 training shifts with an experienced shift leader "shadow shifts"
  - best done immediately after shift training
  - ideally includes at least one injection permit and one warm start
  - inform Alessandro/Alex, once shadow shifts are completed, so that we add you to the shifter list and allow you to book your shifts (if not already done)
    - If needed we can add you beforehand so that you can plan your presence long-term. Either way you are committing to taking the shift and shadows/training beforehand!

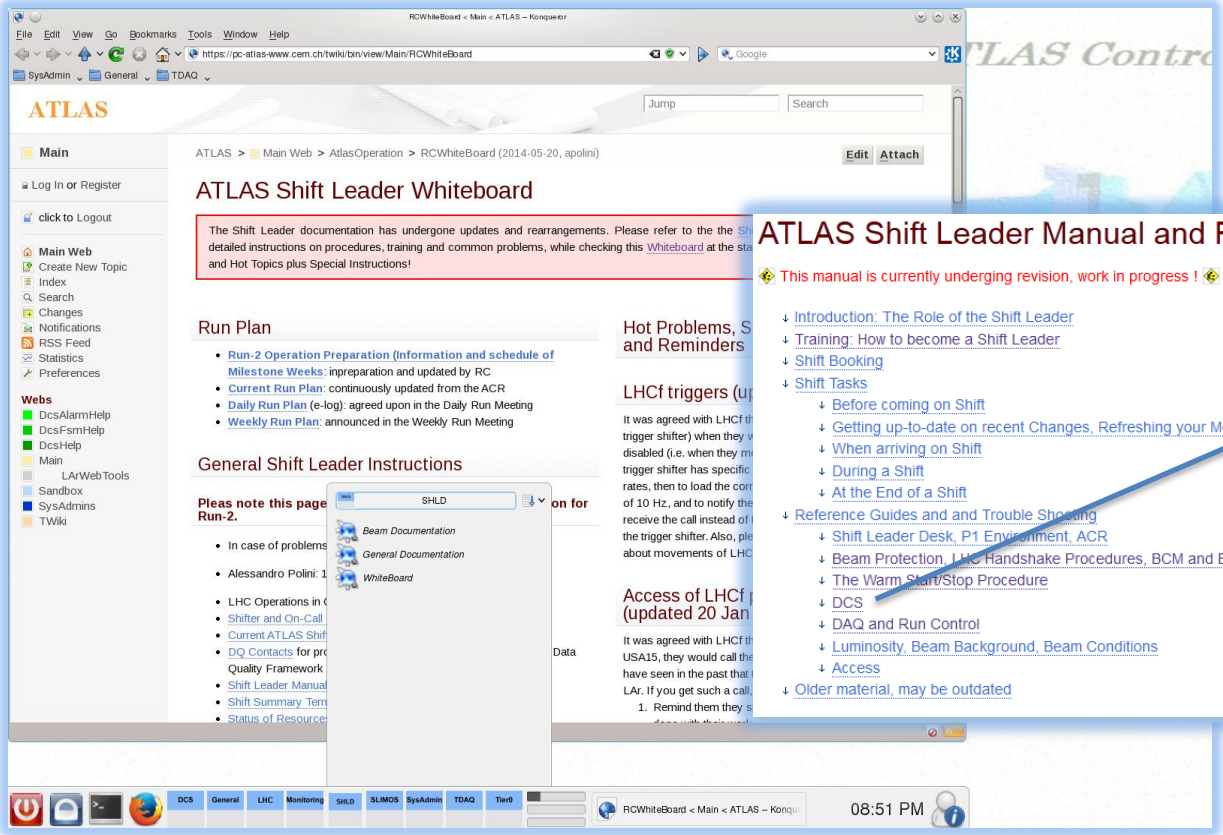
Less restrictive: no proper beam conditions yet...
~1 shift

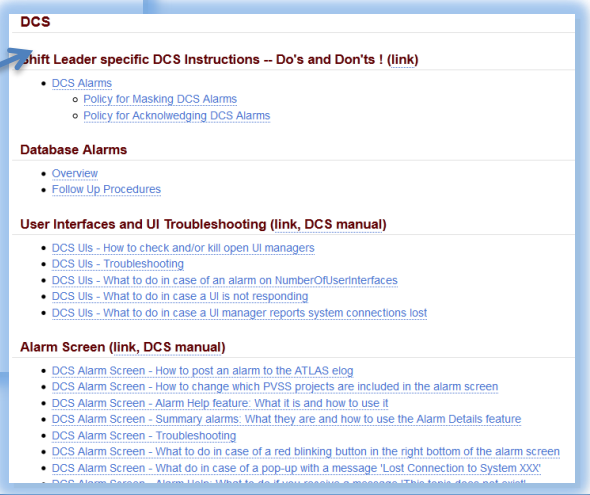
ATLAS Operation @ M9

- ATLAS Combined Running
- Preparation for Combined Run
  - essential to establish asap the required conditions for your tasks
  - Report promptly problems to shift leader & relevant syscoord.
- After beam dump quiet LHC time
  - Magnet ramp up-down
  - pilot test beam
  - Systems are normally using that time for standalone calibrations, and tests.

Documentation

- These training slides, for basics and and overview
- The Shift Leader Twiki Whiteboard https://atlasop.cern.ch/twiki/bin/view/Main/RCWhiteBoard
  - Lates News, Default Configurations, Hot Topics
- The Shift Leader Twiki Reference Manual https://atlasop.cern.ch/twiki/bin/view/Main/IShiftLeaderInstructions
  - Restructured: Reference Guide





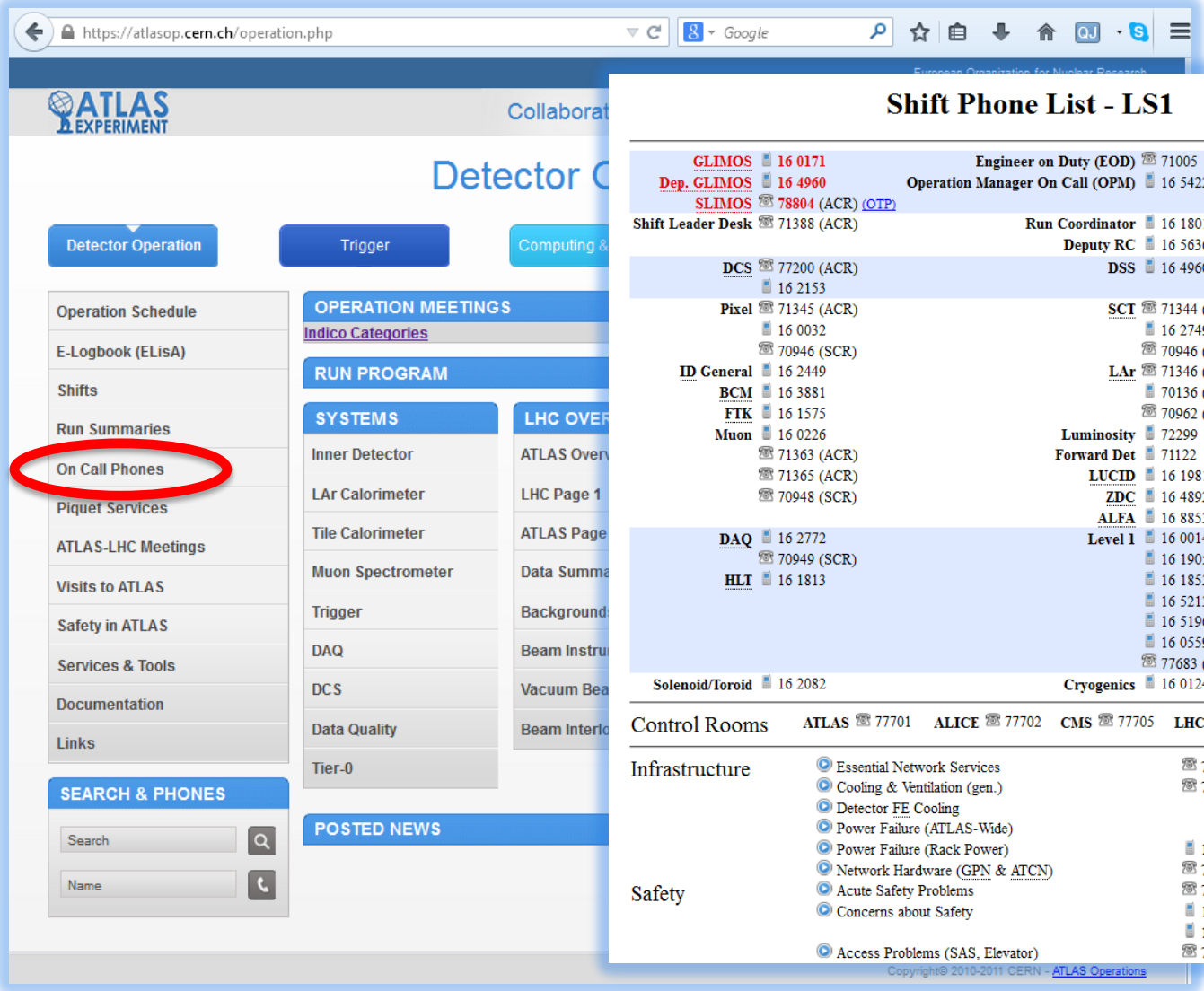
Bear in mind that there may be legacy Run I / obsolete / imperfect documents: help us improve in your spare time!

Who to interact with

- Normal issues:
  - sub-detector, run control, trigger, DQ shifters:
    - Be on-top of what is happening in the CR!
    - Make sure they follow instructions/expert guidelines
      - routine tasks
      - liaise with experts & system run coordinators
  - encourage people in the control room to communicate!
- Serious issues: **call run manager phone** (75870) [→ run coordinators], involve system run coordinators
- Technical Infrastructure and Safety issues: SLIMOS, OPM in case of major problems or SLIMOS absent
- Better call once too often than not enough!!

On-call phone numbers

- List accessible from main ATLAS operations page



Shift Phone List - LS1

Expert Phone List

GLIMOS 16 0171	Engineer on Duty (EOD) 71005	Fire Brigade 74444 (Emergency)
Dep. GLIMOS 16 4960	Operation Manager On Call (OPM) 16 5422 (OTP) (24/7)	74848 (Information)
SLIMOS 78804 (ACR) (OTP)		
Shift Leader Desk 71388 (ACR)	Run Coordinator 16 1801 (A. Polini)	RPE 16 1870
	Deputy RC 16 5636 (A.Cerri)	LACS 77600 (Access)
DCS 77200 (ACR)	DSS 16 4960	Sysadmin 16 4851
16 2153		Netadmin 16 2773
Pixel 71345 (ACR)	SCT 71344 (ACR)	TRT 71343 (ACR)
16 0032	16 2749	16 0547
70946 (SCR)	70946 (SCR)	70946 (SCR)
ID General 16 2449	LAr 71346 (ACR)	Tile 71408 (ACR)
BCM 16 3881	70136 (RC)	16 2581
FTK 16 1575	70962 (SCR)	70954 (SCR)
Muon 16 0226	Luminosity 72299	Expert Desk 76007 (ACR)
71363 (ACR)	Forward Det 71122	Online DQ 79720 (ACR)
71365 (ACR)	LUCID 16 1981	Event Display 16 1094
70948 (SCR)	ZDC 16 4892	
	ALFA 16 8853	
DAQ 16 2772	Level 1 16 0014	Offline DQ 16 1809
70949 (SCR)	16 1905 (L1-TGC)	Offline Reco 16 1996 (PROCs)
HLT 16 1813	16 1853 (L1-RPC)	Tier-0 Ops 16 1928
	16 5213 (L1-Calo)	
	16 5196 (L1-Recv)	
	16 0559 (L1-CTP)	
	77683 (SCR)	
Solenoid/Toroid 16 2082	Cryogenics 16 0124	Gas System 16 2516

Control Rooms — ATLAS 77701 | ALICE 77702 | CMS 77705 | LHCb 77708 | CCC 77600, 70480 (beam-related)

Infrastructure

- Essential Network Services
- Cooling & Ventilation (gen.)
- Detector FE Cooling
- Power Failure (ATLAS-Wide)
- Power Failure (Rack Power)
- Network Hardware (GPN & ATCN)
- Acute Safety Problems
- Concerns about Safety

75011 – Computer Center Operator
72201 – CCC/Technical Infrastructure

Safety

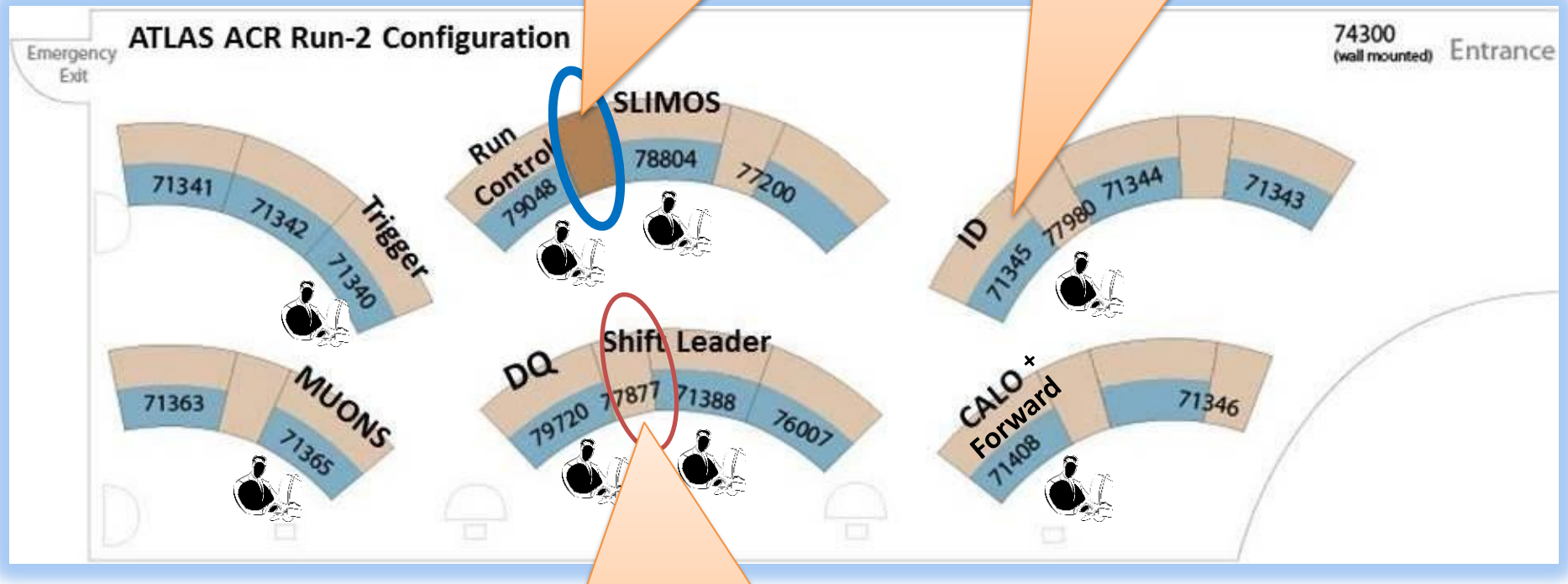
- Access Problems (SAS, Elevator)

16 5422 – OPM
74927 – Netops
74444 – Fire Brigade
16 0171 – GLIMOS
16 4960 – Deputy GLIMOS
72201 – CCC/Technical Infrastructure

ACR Layout and Desks, Shifters

Rack with safety systems interlocks including beam operation + emergency measures (SLIMOS training)

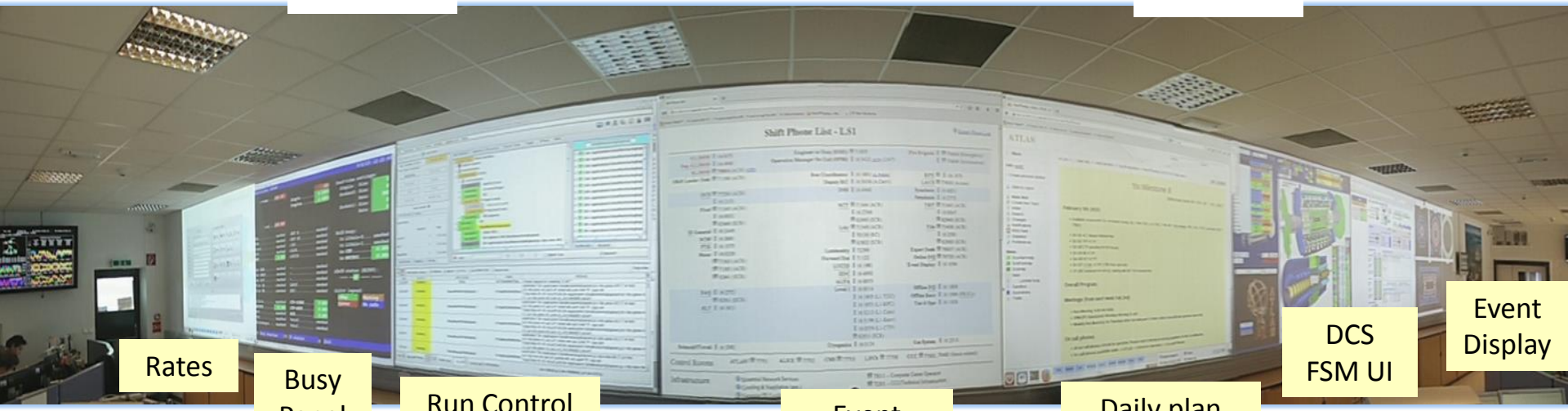
ID shifter:
- Pixel shifter takes care of BCM/BLM
- SCT takes care of ID environment



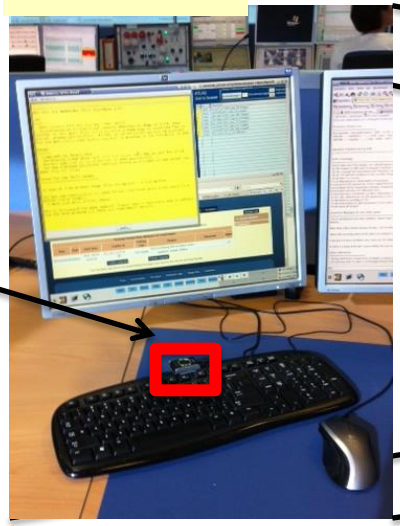
Single monitor with keyboard controlling the 8 screens on the wall, including wall event displays

ATLAS Projectors

- Keep the following open and displayed on the 8 projector displays ...



Switch between screen 1 and 2



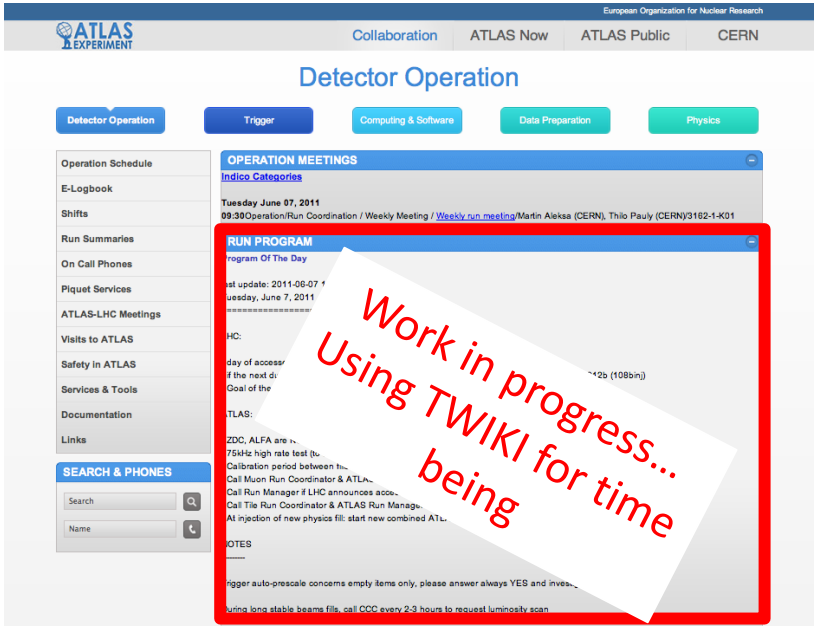
Start of Shift (1)

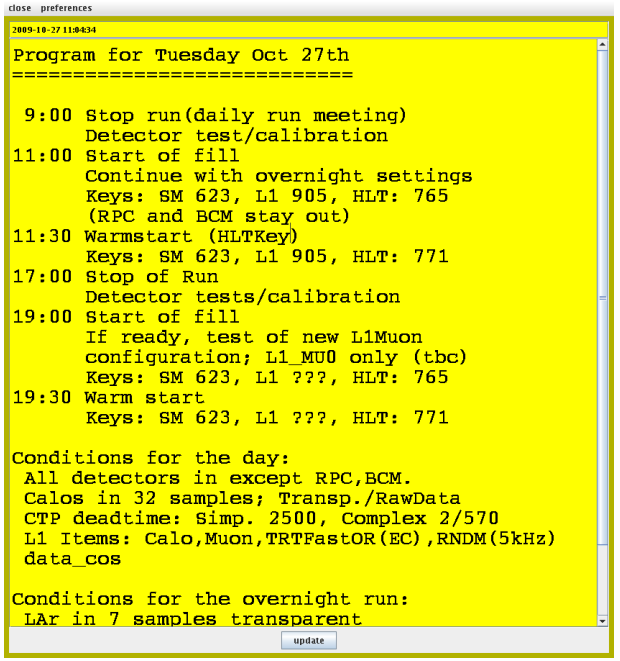
Be prepared:

- Prior to your shift:
  - Read the Shift leader Whiteboard
- Come to the control room ~20 minutes before the start of your shift and discuss with the previous shift leader:
  - run plan
  - ATLAS conditions (Run Control IGUI state, DCS state, alarms, errors, ...)
  - Integration status and plan for the coming shift
- Read the previous shift leader summary
- Check for new instructions on the shift leader whiteboard

Start of Shift: Run Plan

- Updated by the run coordinators after the daily meeting.
  - SL: Post to elog “Run Plan for Day”
- Keep it up to date throughout the day:
  - remove completed items
  - note changes
- Up-to-date information on trigger keys/menu: refer to Trigger Whiteboard!





Start of Shift (2)

- Introduce yourself as the shift leader to the shift crew
- Check that the shift crew is complete
  - Make sure that the previous system shifters do not leave before their replacement has arrived
  - If [next shifter is late > 15'] ⇒ ask current shifter to call their system's ON CALL phone who is expected to either find a replacement or come in themselves.
    - For missing shift leader ⇒ call the run manager (no answer ⇒ run coordinators).
- Log-into DCS FSM and alarm screen (→ DCS session) and remote access tool (M8: access will be open, test the tool though!) to see immediately whether you have the necessary privileges
- Close any unused or duplicate panels and windows on the shift leader desk
- E-log entry with status and plans for your shift
- Refresh whiteboard
- Start following up items and ongoing activities ASAP

Start of an ATLAS Combined Run
(General Considerations)

- Make sure most systems are included
  - Exceptions: explicitly specified in run plan
- Your responsibility:
  1. problems are followed up
  2. documented in the ELOG, by you or relevant shifter even during the start of the partition
- ATLAS run should start asap
- Make sure the priority and focus are kept
  - Evaluate priority of the requests
  - Not in daily plan → understand what they they are:
    - calibration updates are usual tasks
    - changes to software should only if agreed in run meeting or with RC
    - check with the run coordinators if in doubt
    - Access requests → see with Run Manager and SLIMOS

Start of an ATLAS Combined Run (2)

1. Decide settings of the new combined run considering:
   - run plan
   - info on the SL whiteboard
2. Ask all shifters (if system is participating in the run) to prepare for the run and check the configuration
   - problems → discuss with the shifter of the relevant desk → prioritize, document, follow up
3. Check with the Trigger Shifter about the trigger menu (→ trigger part)
   - Super Master Key SMK can only be changed before starting a run!

Start of an ATLAS Combined Run (3)

4. Ask run control shifter to bring up the ATLAS partition IGUI and check the configuration
   - Run control shifter → make sure that the proper segments are ENABLED
     - if not sure, check with sub-system shifters
   - DQ shifter → check that the DQ and monitoring segments are ENABLED
   - SL → Check trigger keys
   - In case of segment modification involve the shifter of the particular sub-system
   - check project tag (→ DAQ part, normally data14_cos, see WhiteBoard) and that recording is enabled
5. Ask the run control shifter to cycle through the DAQ FSM until we are RUNNING
6. Problems ⇒ check with sub-detector shifters, make sure on-call experts are involved if necessary
   - have sub-det shifters promptly call their experts if needed!
   - Call run manager if shifter and expert think the problem cannot be solved on time for beam

Checklist

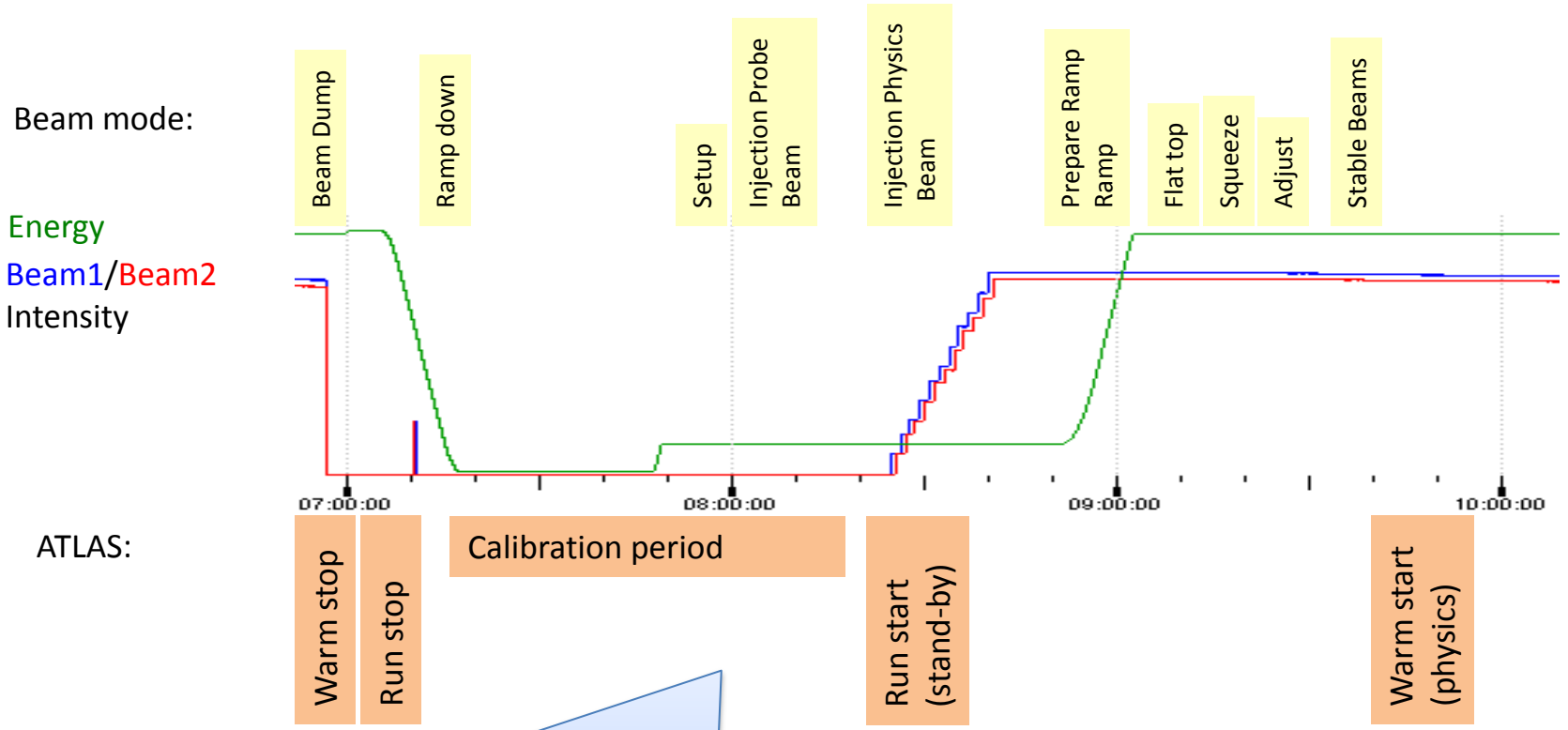
- Your friendly task reminder!
  - Beware: not all of your tasks are listed
  - Your duties are not limited to checking the checklist!
- Open your checklist as soon as you take over the RC desk
- Make sure you regularly check and address the indicated tasks
- Still work in progress: help us improve it!

Instruction	Status	Comments
(Last Update 24-11-2014 Milestone 7) Please note that this checklist is still a draft form. It will be soon be automatically triggered by the shifter assistant to display the general part and a run related checklist. For the moment it is considered as general guidelines for a good shift during M7. Comments and sugestions are welcome. Thanks A+A	Not Done / Worked / Failed	Browse... No files selected.
Introduce yourself to the Run Control shifter and to the SLIMOS.	Not Done / Worked / Failed	Browse... No files selected.
Check that the Control Room shift crew is complete.	Not Done / Worked / Failed	Browse... No files selected.
Check the Plan of the Day. This page should be present on the 3rd projector window from the right. Onn request of Run Coordinator you might edit it to reflect changes in the planning for the day Help	Not Done / Worked / Failed	Browse... No files selected.
Log in to the Access Manager Roles Tool. Make sure you also log in on the wall display so you hear the doorbell sound. Help	Not Done / Worked / Failed	The Access Manager Roles Tool can be opened from the "SysAdmin" menu. Browse... No files selected.
Read recent messages on the ATLAS Shift Leader Whiteboard. Do not forget to update it during your shift. Help	Not Done / Worked / Failed	The Run Control Whiteboard can be opened from the "SHLD" menu or by clicking on the question mark. Browse... No files selected.
Log in to the ATLAS e-log and read all recent entries. Help	Not Done / Worked / Failed	The ATLAS e-log can be opened from the "General" menu or by clicking on the question mark. Browse... No files selected.
For each start of a Combined Cosmic Run please make sure the Run Checklist is followed Help	Not Done / Worked / Failed	The Run Checklist can be opened from the help link given Browse... No files selected.
Log in to the DCS Alarm Screen. Warn subsystem shifters about persistent alarms. Make sure they are followed up by experts.	Not Done / Worked / Failed	The DCS Alarm Screen can be opened from the "DCS" menu. Log in by clicking on the key icon. Browse... No files selected.
Watch the DSS Alarms. Make sure that the SLIMOS is aware of them. Report them in your e-log shift summary. Help	Not Done / Worked / Failed	The DSS Alarms can be opened from the "SLIMOS" menu or by clicking on the question mark. Browse... No files selected.
Systems Affected: ALFA (RPO) BCM Beam Conditions CSC Counting Room Cryo DAQ DCS DSS DataQuality Event Displays GAS HLT ID Gen. (IC) LArg LVL1 Lucid MDT Magnets Monitoring Network OnlineDB Other Pixel RPC Radioprotection RunCoord Info SCT Safety SysAdmins TGC TRT Tech. Infra Tier0 Tile ZDC		

Username: Password:

Submit E-Log

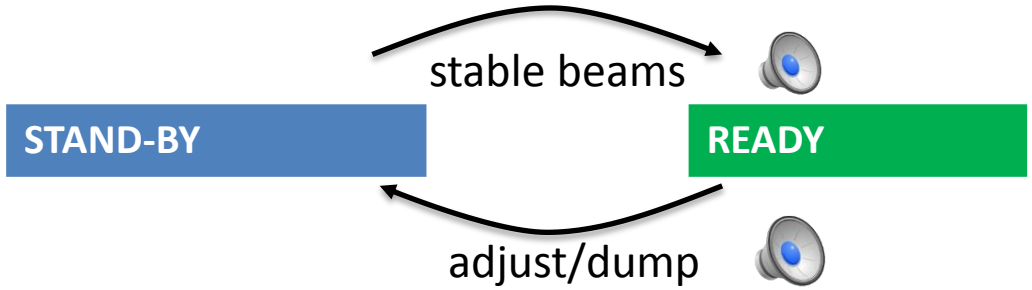
LHC cycle and ATLAS Run



Please note that although we are in M8 and have no beam, we will test and try all of these procedures during M8

Typical 2011-2012 time estimates	
Injection	>20 minutes
Ramp	~20 minutes
Squeeze	>10 minutes
Adjust	>7 minutes
Pre-cycle	~45 minutes
Dump to stable beams	>127 minutes

Warm Start, Warm Stop



Pixel/IBL	No HV, pre-amps off to reduce occupancy		HV on, pre-amps on
SCT	lowered HV (50V instead of 150V), larger noise occupancy		physics HV
Muons (RPC, TGC, MDT, CSC)	lower HV, lower efficiency		physics HV
Trigger	standby menu		physics menu, new lumiblock

- On reaching stable beams, check that:
  - PIX HV ramps and PIX pre-amps turn on (both are normally automatic)
  - PIX READY in DCS → Automatic warm-start done by DAQ **Check this happens !!**
- After warm start check muons and SCT get to READY as well (but do not wait for them!)

During data-taking in combined run

- ~10’ into a stable run ask all shifters to assess sub-detector data quality status
- Check with trigger shifter:
  - Trigger rates consistency: expected ⇔ measured (L1, L2, EF, recorded)
  - Correct trigger keys are used, check bunch group set, pre-scales in L1 and HLT
  - Streams are populated with the expected ratios
- Make sure that event displays are updating
  - problem ⇒
    1. ask DQ shifter to investigate (e.g. run on “wrong” triggers)
    2. Troubleshooting instructions are on DQ shifter twiki: ask DQ shifter to act!
    3. Event display on-call
- Follow up on alarms, failures, errors
  - DCS: Monitor DCS status and alarms on the DCS Alarm Panel. More in the DCS session
  - DAQ: Make sure that ERROR and FATAL messages are documented and investigated
    - Task for the run control shifter and subsystem shifters
    - Known warnings/errors/fatals can only be ignored if these are known messages...
    - WARNINGs should also be investigated
- For serious failures, consult run manager
    - make an e-log entry ASAP: people depend on this to follow from outside without calling in

During combined data-taking
What to do in case of problems

- **Reminder:**
  - the **emphasis is data-taking**, not debugging.
    - Sometimes, sub-detector experts are not aware of this and need to be reminded.
    - Should not spend >5 minutes on a problem if stopping the run and re-configuring the sub-detector fixes it.
  - make sure to involve the run coordinator early, as soon as the problem arises
- **Constant busy, stop-lessly removed/recovered:**
  - assess how much of the detector is disabled
  - Consult guidelines on SL whiteboard, whether one can continue or should stop the run
  - if above threshold
    - IF Detectors supports TTC restart ⇒ use
    - ELSE: stop/restart run
- **Persistent constant busy from a sub-detector**
  - notify the sub-detector shifter → if busy cannot be cured within a couple of minutes, proceed:
    - Do a TTC restart for systems supporting it, otherwise stop the run
    - Call run manager
    - re-start the sub-detector segment only
      - pre-warn the run control shifter that s/he does not accidentally re-configure all of ATLAS.
      - S/he should only right-click on the sub-detector segment and re-start the sub-detector segment
    - start a new run

Warm Stop Procedure: Physics → Standby

	Unscheduled dump	Adjust Handshake	Dump Handshake
Trigger/DAQ	Automatic on Post-Mortem (PM) reception	Automatic on LHC WARNING message (SL must publish PREPARE)	Automatic on LHC WARNING message (DCS publishes PREPARE automatically)
Pixels	Automatic on PM reception. Once the STABLE BEAM flag disappears, Pixel would switch-off abruptly.	Automatic on LHC WARNING If STANDBY is not reached within 5 minutes, PROBLEM will be published automatically to avoid the beam dump.	Automatic on LHC WARNING
SCT	Automatic on STABLE BEAM=false (few minutes after dump)	Automatic on WARNING, with a small delay	Automatic SCT ramp down (with a delay).
Muons	Automatic on STABLE BEAM=false (few minutes after dump). RPC HV will stay on for additional 20 minutes.	Automatic on WARNING	Automatic on STABLE BEAM=false (few minutes after dump). RPC HV will stay on for additional 20 minutes.
Shift leader	-	Publish READY as soon as SCT, Pixels and Muons are in STANDBY (don't worry if an automatic PROBLEM is published after 5 minutes).	After 5 minutes the beams will be dumped, unless we publish PROBLEM before (please call the run manager and the CCC in this case, to explain which problem we have).

Covered later in the part on LHC Interactions

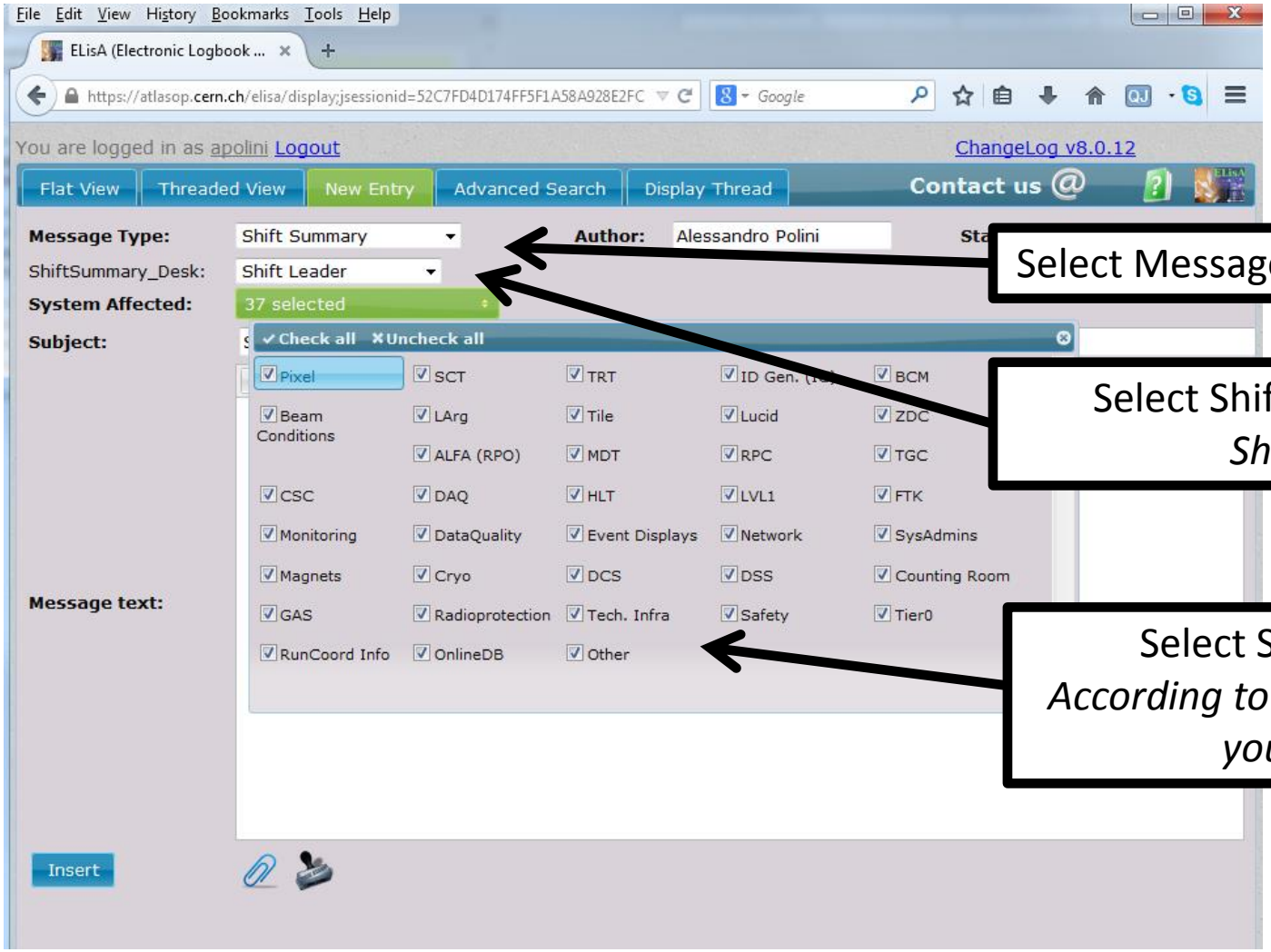
Will validate these procedures during M8

Calibration Runs

- Minimum dump → stable beams time: 2h07’ in 2011
  - allow for some head-room for configuring and starting the ATLAS partition in case of problems (~0.5-1h, to be judged)
  - typically leaves ~1h for sub-detector calibrations between fills
- After beam dump during ramp or stable beam, stop run and go into a 1-hour calibration period (announce on elog and to all shifters)
  - All detectors stay in safe mode during one hour calibration period.
  - If longer break (>3 hours) foreseen, contact run manager 75870.
- Ask shifters whether they need to do calibrations
  - ask for how long they need and give them an appropriate dead-line when they should be finished
- After the calibration period is over, check with shifters on the calibration progress and completion
  - give additional time if needed and available

End of Shift

- Prepare the Shift Leader Shift Summary – here a snapshot from the new Elisa Logbook



Select MessageType=*Shift Summary*

Select ShiftSummaryDesk = *Shift Leader*

Select Systems Affected *According to what is concerned by your summary*

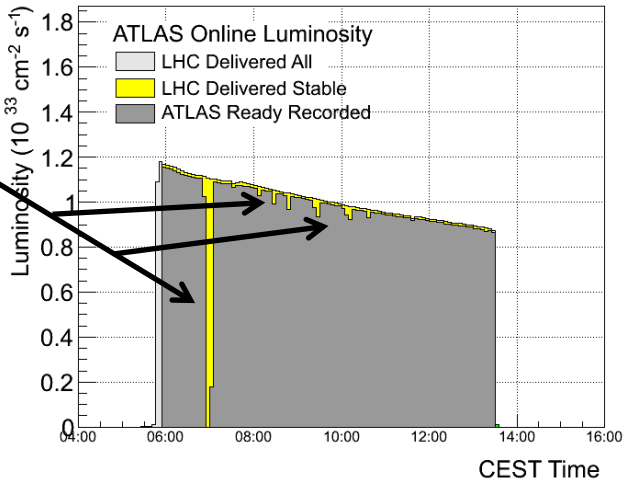
Contents of Shift Leader Summary

- Shift report = entry in the ELOG written at the end of the shift, containing the following information
  - template available: https://atlasop.cern.ch/twiki/pub/Main/IShiftLeaderInstructions/ShiftLeader_Summary_Template.txt

```
Start of Shift
==============
LHC Status:

ATLAS DCS Status:

ATLAS DSS Alarms:

ATLAS Alarm Screen:

Daily Run Plan
==============
Link to Run Coordination e-log when available

Summary of Long Runs
====================
Run Number - Recorded Events - SMK - L1 PS - HLT PS - BGK - Project Tag

Operation Problems during Shift
===============================

Shift Chronology
================

Important Messages for next Shift Leader
========================================

Other Information
=================
```

- It is your responsibility that the list of runs is documented in a shift summary report
  - with run number, approximate duration, run type, luminosity at start of run, good/bad run, ...

- List of encountered problems: with the DAQ, DCS, infrastructure, …
- Report on machine transitions: injections, ramps, and dumps.
  - Post Mortems: were they clean?
- Comments from your experience, suggestion, things which according to you are missing...
- Read and learn from previous shift summaries



P1 Computing Access Management (P1 Roles)

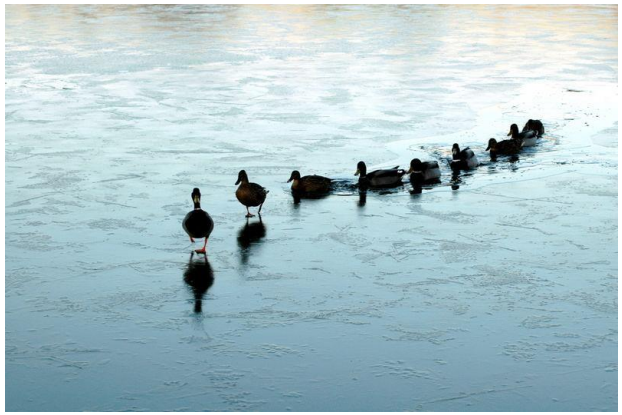
- During data taking periods **the Shift Leader** controls who can access P1 computers from remote
- During an LHC fill only grant access if you know that the intervention is totally harmless for data taking (checking log files is ok, but NO new patches, installations, etc.)
- Call the person who requests remote access in case of any doubt before you confirm the request!
- Make sure sub-detector shifters know about interventions from their experts

If in doubt, deny the request and check with the run manager or system run coordinator

Thank You!

During Run-2

- Lead shift crew to efficiently take data of good quality
  - focus and ensure common sense
  - Make sure people in the control room communicate !



- Implement daily plan
  - combined running in sync with LHC
    - handshakes (injection, adjust, abort)
    - warm start/stop
  - calibrations, tests
- Check basic parameters of operation (trigger/DAQ and detector configuration, trigger and output rates, deadtime, detector status, data quality, etc)
- Interact with shifters, experts, run manager, run coordinators, system run coordinators, CCC
- Follow up on problems, failures and alarms
- Log the progress of ATLAS operation

Training for Shift Leaders: What's next?

- Complete today's training sessions …
- Ask questions
- Do 2-3 training shifts with an experienced shift leader "shadow shifts"
  - best done immediately after shift training
  - ideally includes at least one injection permit and one warm start
  - inform Stephanie/Thilo, once shadow shifts are completed so that we add you to the shifter list
    - Exceptionally can also be done before having completed shadow shifts if you already want to sign up for shift leader shifts and commit to them "in blood"