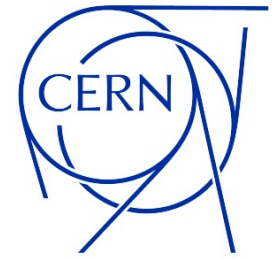




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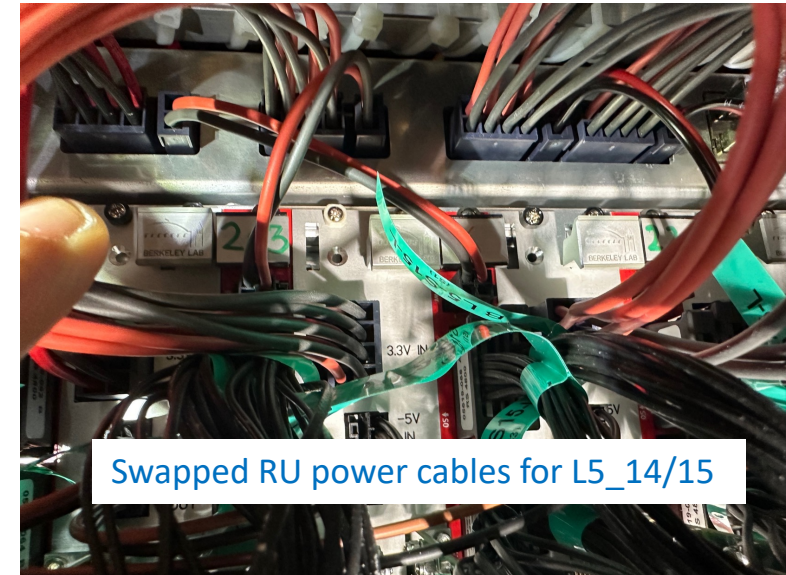
ITS Technical Coordination Report

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Interventions

- May 6th
 - [L6_00](#): stave undervoltage on April 30th → CAEN power supply board (A3009B) replacement
 - [L5_15](#): RU CAEN trips on April 12th and April 29th → replaced the power patch cords and swapped the RU power channels
 - [L3_22, L3_23, L6_12, L6_16 and L6_23](#): significant PU/trimmer offsets → Power Board (PB) patch cord replacements
- May 8th
 - [L6_16](#): RU trip → RU power cable replacement
- June 10th (during TS1)
 - [Reflashing RU scrubbing images](#) in TS1
- June 13th (during TS1)
 - [L5_15/L5_14](#): no trip found since May 8th, reverted the swapped RU power cables
 - [L4_03, L5_07, L6_10, L6_31 and L1_01](#): PB patch cord replacements
 - L4_03, L5_07, L6_10, L6_31: significant PU/trimmer offsets
 - L1_01: two HIC/PU trips in the previous few weeks



DCS



- CRU monitoring
 - CRU monitoring now directly uses the Kafka library
 - Significant performance improvements achieved through modified configuration and code
 - Error-increase variables in link monitoring allowing differentiate transient and persistent issues
 - No more EOR checks based on CRU data (replaced by real-time alarms on persistent issues)
- Auto-recovery
 - Issue where recovery was not running on all lanes for a stave – fixed
- Persistent Timebase loss of lock errors during clock transition – fix in place, to be checked with next clock transistions
- Prepare-For-Run (PFR)
 - Always force reconfiguration between runs (simplifies FSM, in practise reconfiguration was always used)
- ITSComm database interface
 - Stuck in LOADING when changing detector configuration – ongoing
- WinCC/FSM
 - CRU link counters available in RU counter panel
 - Improved handling of PFR in FSM to avoid blocking in CONFIGURING
 - Bug fixes related to loading of mixed DB versions after ITSComm being stuck
 - Enhanced transition states: MONITORING_OFF state color changed to yellow

Thanks to the FLP and central DCS teams for their ongoing support!

CRU Link counter

Status	Packets processe	Packet protocol E	Corrupt SOI	Corrupt EOI	Corrupt RDI	Length mismat	CRC mismat	Unexpected inde	Packet link ERR F	Packet link ERR DA	Oversize	FEC	Glitch	SOR orbi	Error Inca	PHY erro	Age	Dela
0	1	0	0	0	0	0	0	0	0	0	0	0	335 46925668	0	0	0	1	3
1	1	0	0	0	0	0	0	0	0	0	0	0	1115 30070929	0	0	0	1	3
2	1	0	0	0	0	0	0	0	0	0	0	0	803 17431167	0	0	0	0	2

CRU/RU



- Discarding of packets with corrupted RDH is now available in CRU (thanks to the central CRU team)
- RU PU controller power interlock [ongoing]
 - No power interlock triggered when a SEU induced bit flipping of a back-bias channel occurs
 - Solution: turn off the channels chained to the same BIAS channel and set the power interlock
 - Pull request merged; a new RU firmware version to be released

To be monitored

- L1_01: HIC/PU tripped twice in the previous weeks → will be further monitored
- L4_01: RU tripped last week. This is the first occurrence, and the current trend is stable → will be further monitored
- Cooling
 - No new visible issues developed since last intervention in February
- PU and trimmer voltage offsets
- SEU protection in RU FW
 - Data corruption currently our main EoR reason
 - To be better understood with the help of the new CRU monitoring
 - Upset rate for Pb-Pb operation at 50 kHz to be estimated once pp operation is consolidated
- Threshold and fake-hit rate (refer to Jory's report for the detailed detector (IB) recalibration)

ITS2 ToDo list

- A dedicated [ToDo list](#) being prepared and maintained by (D)TC
 - Issue/task updates will be discussed in the weekly ITS2 TC meeting
 - Includes summary table, detailed tables for each topic, and links to detailed notes for each issue/task

1	Topic	Summary	Assigned to	Priority	Status	Last update	Remarks
2	Operation	Threshold scan: Not-OK lanes in several (~5) IB staves	Artem, Jory, Ivan	High	In pro...	03/6/2024	TS1, tests; retuning detector first
3	Operation	SOR and EOR can't be propagated to daughter nodes if the half-stave/layer is in MIXED state	Sergey, Artem, Jory	High	In pro...	03/6/2024	TS1
4	Operation	Several staves stuck in NOT_SAFE when moving to SAFE	Sergey, Artem, Jory	High	In pro...	03/6/2024	TS1
5	Operation	Voltage stability during PHYS runs	Artem, Jory, Markus, Felix	High	In pro...	03/6/2024	
6	Operation	IB chips constantly in ERROR	Artem, Jory	High	In pro...	17/6/2024	TS1, DTU settings
7	Operation	Decoding errors related to auto-recovery	Artem, Nicolo', Markus	Medium	In pro...	17/6/2024	
8	ITSComm	CRU Monitoring with Kafka (including performance problems)	Markus, Sergey	Urgent	In pro...	10/6/2024	TS1, tests
9	ITSComm	Hard-RU in-run recovery (XKCU re-program)	Markus, Sergey, Felix	High	In pro...	03/6/2024	TS1
10	ITSComm	Soft-RU in-run recovery (reset everything but power control)	Markus, Sergey, Felix	High	In pro...		
11	ITSComm	ITSComm database interface	Sergey, Markus	High	In pro...		
12	ITSComm	EOR checks	Markus	Medium	In pro...		
13	ITSComm	Additional data points to be added to ADAPOS	Markus	Medium	In pro...		
14	ITSComm	Short dry run before SOR	Markus, Sergey	Medium	Open		
15	ITSComm	Automatic pixel mask refresh	Markus	Medium	In pro...		
16	ITSComm	Flashing RU FW images	Markus, Felix	Low	Open		
17	ITSComm	Use CRU DMA status in calibration scan instead of 60s wait	Markus	Low	Open		
18	WinCC	Panels lost during UI update and WN splitting	Sergey	High	In pro...		
19	WinCC	Review of the alerts in WinCC	Sergey, Markus, Artem, Jory, Felix, Jian	High	In pro...		
20	WinCC	Error on RU and PU trip	Sergey	High	In pro...		
21	WinCC	Transition states during Safe/R	Sergey	High	In pro...		
22	WinCC	Fail PFR without failing the environment creation	Sergey	High	In pro...		
23	WinCC	Clear indication of staves that failed SOR or EOR	Markus, Sergey	High	Open		
24	WinCC	Safe mechanisms	Sergey, Markus	High	In pro...		

Operation ID	Summary	Assigned to	Priority	Date of entry	Status	Description	Last update	Remarks	JIRA (if applicable)
1	Threshold scan: Not-OK lanes in several (~5) IB staves	Artem, Jory, Ivan	High	31/5/2024	In pro...	retuning detector first => debug the problematic staves	03/6/2024	TS1, tests; retuning detector first => dedug the problematic staves	
4	SOR and EOR can't be propagated to daughter nodes	Sergey, Artem, Jory	High	31/5/2024	In pro...		03/6/2024	TS1	
5	Several staves stuck in NOT_SAFE when moving to SAFE	Sergey, Artem, Jory	High	31/5/2024	In pro...		03/6/2024	TS1	
8	Voltage stability during PHYS runs	Artem, Jory, Markus, Felix	High	31/5/2024	In pro...		03/6/2024		
2	IB chips constantly in ERROR	Artem, Jory	High	03/6/2024	In pro...		17/6/2024	TS1, DTU settings	
3	Slave stuck in CONFIGURING when processing PF	Sergey, Artem, Jory	High	31/5/2024	In pro...				
9	Decoding errors related to auto-recovery	Artem, Nicolo', Markus	Medium	17/6/2024	In pro...				
6	Noisy OB staves with updated DCol DB	Ivan, Artem, Jory	Urgent	31/5/2024	Closed				
7	EOR gets stuck when the Kafka information isn't available	Markus, Artem, Jory	High	31/5/2024	Closed				

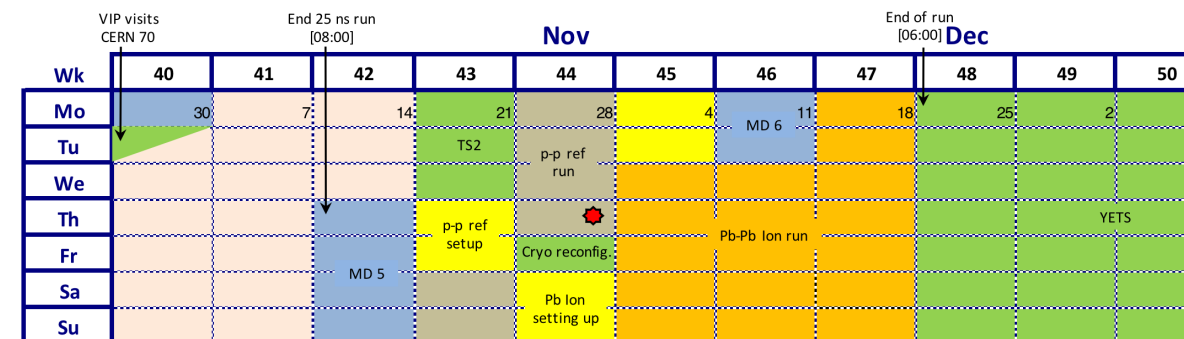
Threshold scan: Not-OK lanes in several (~5) IB staves (Assigned to: Artem, Jory, Ivan, Priority: High, Status: In progress) [Operation:ID:1]

Notes:

- 20240603: retuning detector first => debug the problematic staves
- 20240614: Successfully retuned IB to 100e- and 120e-
- No no unsuccess in THR scan
- Some chips still could be in NOK, primarily from L2_12/L2_14

Plans

- No major interventions are planned for now
- Investigating a few IB problematic chips during data taking and threshold scans
- Major development and maintenance activities include:
 - Optimizing in-run recovery procedures and tools
 - Stability of PFR/SOR/EOR
 - Improvement on detector safe mechanisms
 - Restoring lost WinCC panels
 - A short dry-run before data taking to check data path integrity
- TS2 scheduled from Oct. 21st to 23rd before pp ref and Pb-Pb runs
- YETS starts on Nov. 25th:
 - Reassessing the cooling leak on L5_19 (OB53)



Summary

- Several interventions on PU/RU cables and the CAEN power module
- Significant developments and progress in DCS
- Successful tests and improvements during TS1
- Many further developments are needed to enhance data taking stability/efficiency and to better protect the detector