
Plans and Resources Needed for Follow-up of LBDS UPS Powering Review

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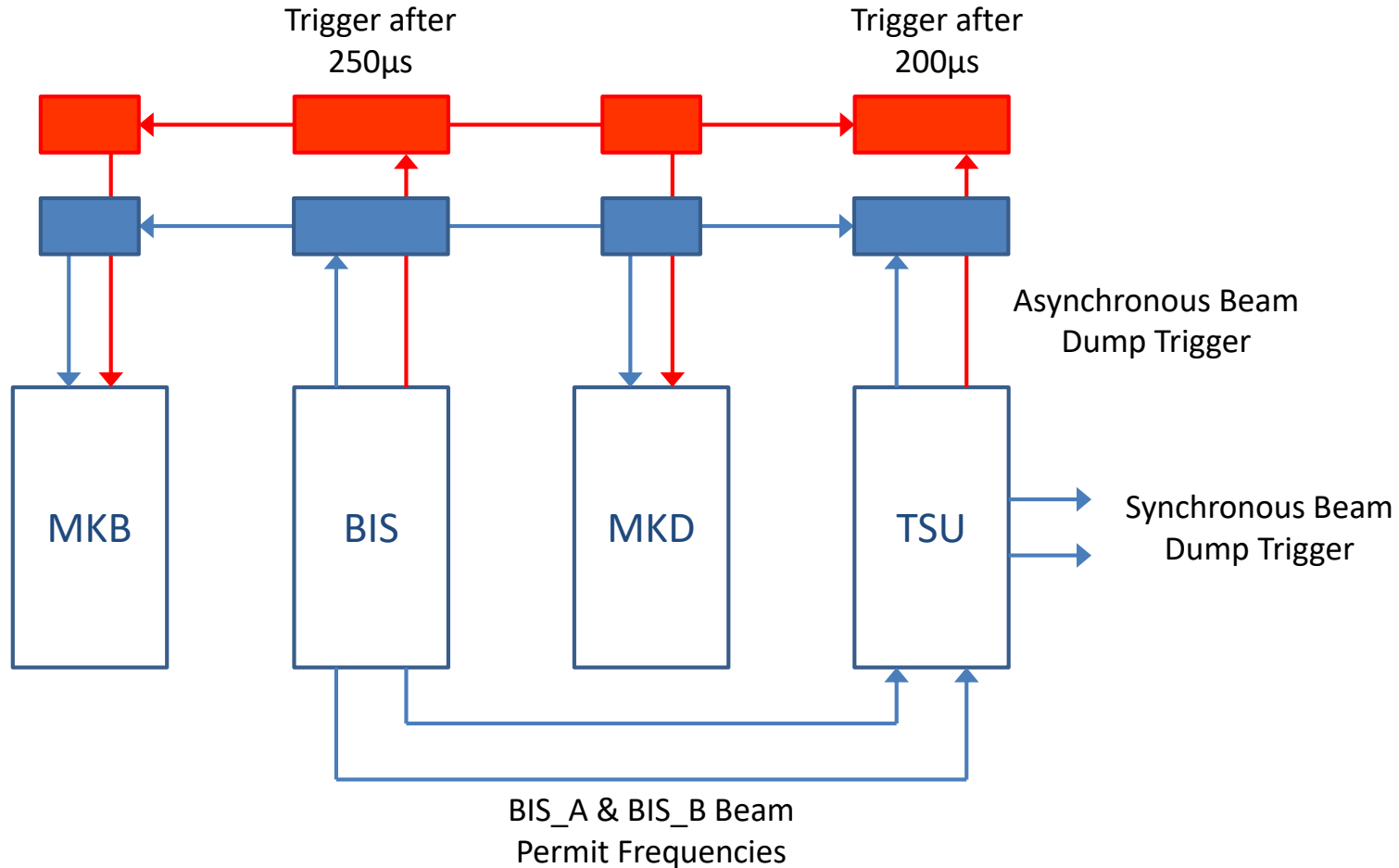
TE/ABT

MPP – 17/08/2011

Outline

- Connection of BIS to LBDS Re-Trigger Lines
- Consolidation of UPS Electrical Distribution within LBDS
- Modification of TSDS Architecture and Study of WIENER Power Supplies Replacement
- Implementation "secondary" voltages surveillance
- Others

Connection of BIS to LBDS Re-Trigger Lines (1/3)



BEAM1
BEAM2

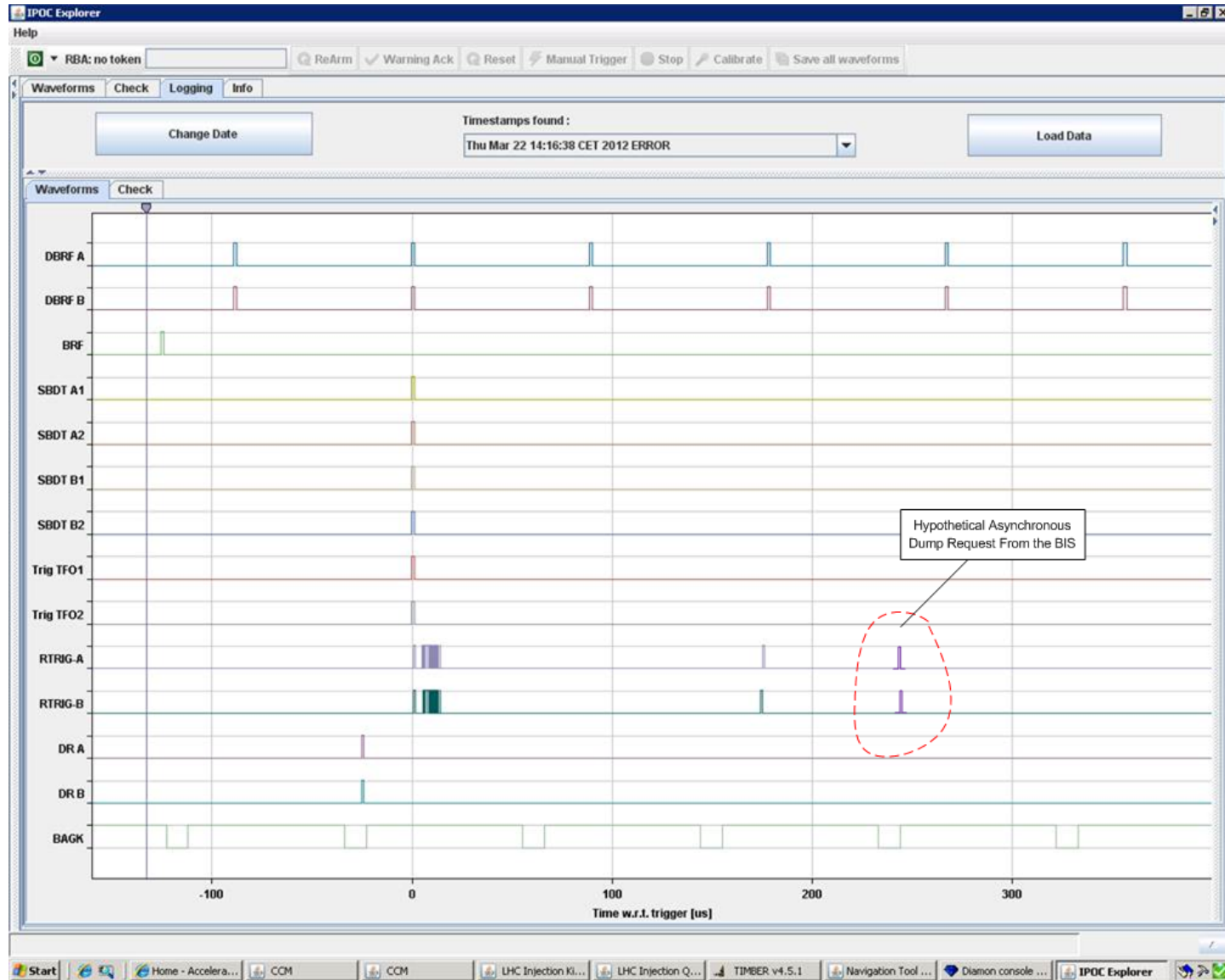
UA67
UA63

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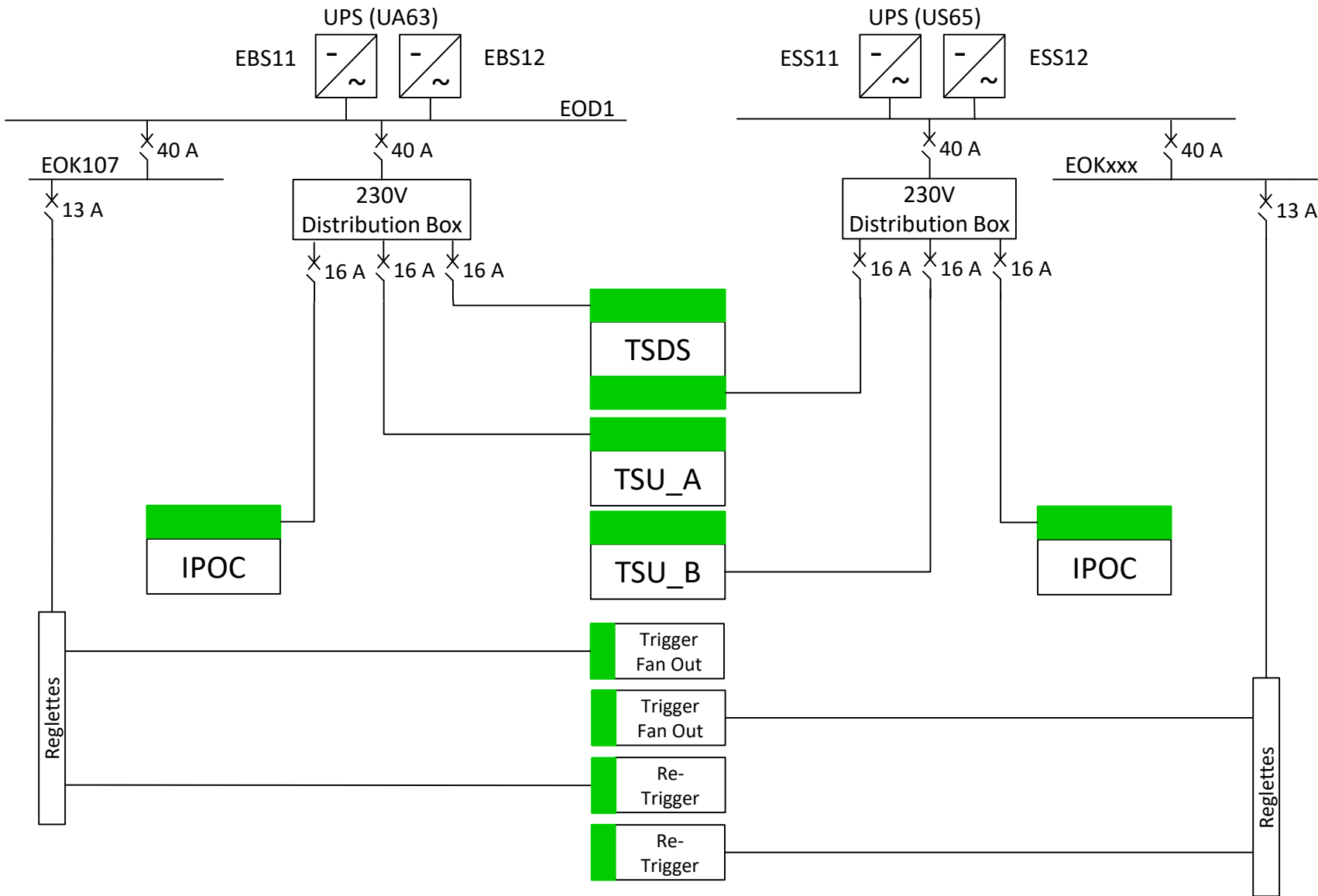
Connection of BIS to LBDS Re-Trigger Lines (2/3)



Connection of BIS to LBDS Re-Trigger Lines (3/3)

What	Who	When
Study possible implementation and integration of redundant asynchronous triggering of the LBDS directly from the BIS.	TE/ABT TE/MPE	10/2012
Produce re-trigger crates with 250us delay (4 + 2 crates).	TE/ABT	03/2013
Modify cables routing of re-trigger lines at the level of the BIS racks in UA63 & UA67 in order to include BIS dump request in the chain.	EN/EL	09/2013
Install cables between BIS and LBDS racks for monitoring of re-trigger crates within BIS.	EN/EL	09/2013
Generate "trigger pulse" from BIS to re-trigger crates for TRUE to FALSE transitions of the BIS frequencies.	TE/MPE	TBD
Add channels in LBDS master PLC surveillance for additional re-trigger crates.	TE/ABT	09/2013
Modify TSU-Ipoc analysis for detection of re-trigger pulses coming from BIS 250us after dump request.	TE/ABT	03/2014

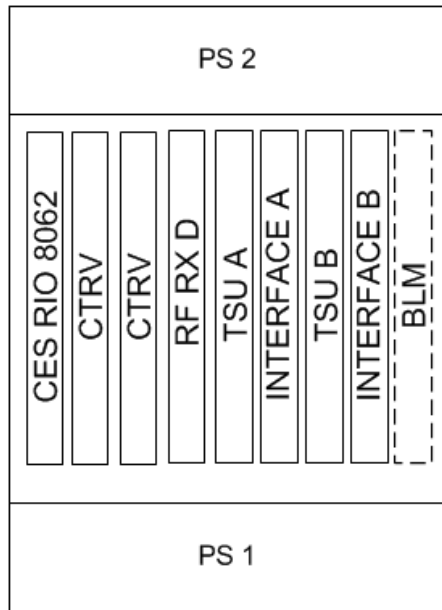
Consolidation of UPS Electrical Distribution within LBDS (1/2)



Consolidation of UPS Electrical Distribution within LBDS (2/2)

What	Who	When
Install redundant UPS powering from UPS in US65 to LBDS general purpose racks (MYDGPxx to MYDGPyy) in UA63 and UA67.	EN/EL	09/2013
Implement correct redundant UPS power distribution system for LBDS general purpose racks.	EN/EL	09/2013
Define specifications and implement power distribution boxes inside racks housing VME & cPCI crates.	BE/CO EN/EL	09/2013
Check correct selectivity of UPS distribution system.	EN/EL	09/2013
Remove temporary LBDS UPS connection to F4 line (QPS) in UA63 & UA67.	EN/EL	09/2013

Modification of TSDS Architecture and Study of WIENER Power Supplies Replacement (1/2)

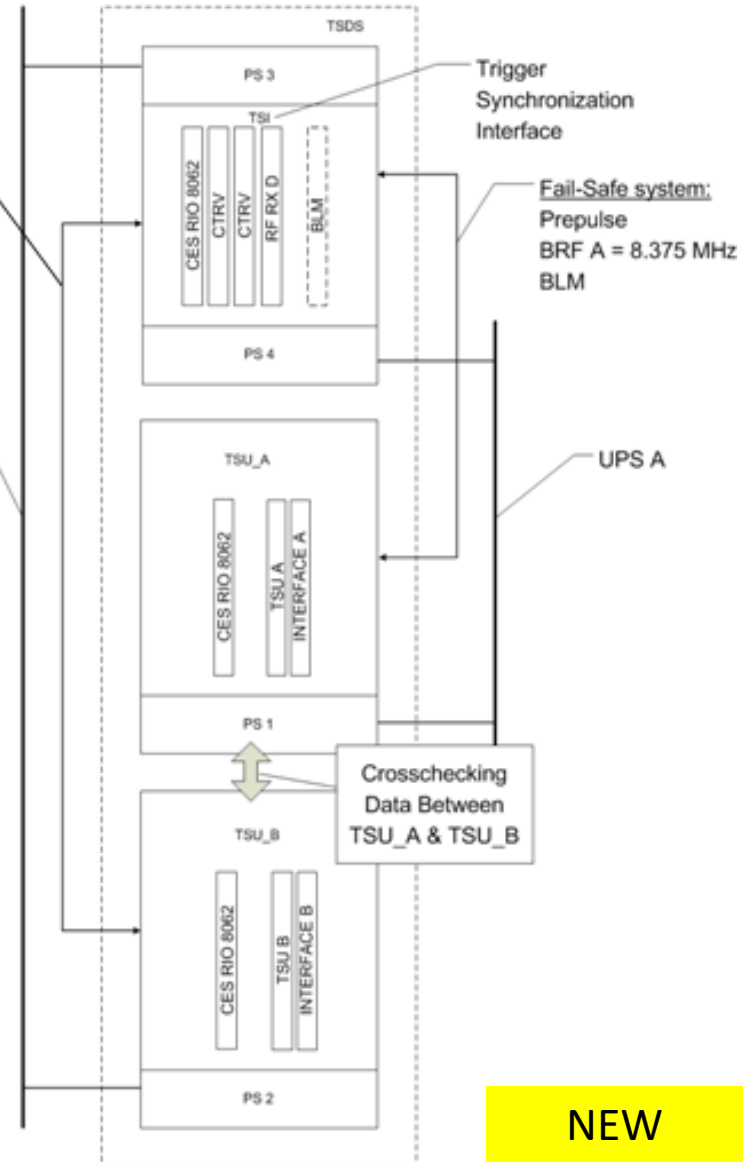


OLD



Fail-Safe system:
Prepulse
BRF B = 9.375 MHz
BLM

UPS B



NEW

Modification of TSDS Architecture and Study of WIENER Power Supplies Replacement (2/2)

What	Who	When
Study the option to replace the actual single FEC housing the two redundant TSUs by separate and fully redundant FECs.	TE/ABT	11/2012
Add diode in the +5V and +12V powering circuit at the input of the TSU & increase capacitance level at the cathode side of the diodes in order to increase hold-on duration in case of global powering failure.	TE/ABT	11/2012
Add internal surveillance of +12V and +5V within the TSU. Generate an INTERNAL_FAULT condition in case of detection of one voltage out of tolerance (typ. -10%) and request a DUMP_TRIGGER through the redundant TSU.	TE/ABT	11/2012
Study the impact (reliability, powering, failure mode...) of replacing the WIENER FECs with new ELMA FECs.	BE/CO TE/EPC PH/ESE	12/2012
Install ELMA FECs in LBDS (1 redundant and 2 simples).	BE/CO	09/2013

Implementation “Secondary” Voltages Surveillance

What	Who	When
Develop (and produce) secondary voltages surveillance modules for G64, VME and TFO crates.	TE/ABT	12/2012
Connect G64, VME and TFO secondary voltages surveillance modules to LBDS ASIbus. Integrate surveillance within safety part of LBDS master PLC. Generate synchronous internal dump request in case of failure.	TE/ABT	09/2013
Implement REMOTE surveillance of VME and cPCI crates. Connect REMOTE surveillance to LHC SIS (INJECTION PERMIT or BEAM PERMIT).	BE/CO	06/2014 (ongoing)

Others

What	Who	When
Review integration of BLMDD within TSDS system. Check possible failure scenarios.	TE/ABT BE/BI	03/2013
Study impact of new TSDS configuration on reliability & availability of LBDS after modification.	TE/ABT	06/2013
Perform a study which predicts the consequences of different type of powering failures (MAINS, UPS and individual secondary voltages).	TE/ABT	06/2013
Define test procedure for a full re-commissioning of the LBDS powering (NORMAL and UPS) after LS1 and after major maintenance activities.	TE/ABT EN/EL	12/2013

Acknowledgments

Many thanks to the reviewers^(*) for their time and effort to look into this important matter and for their valuable recommendations.

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(*) Gerard Cumer (EN/EL), Fabio Formenti (TE/MPE), Wieslaw Iwanski (PH/ESE), Hugues Thiesen (TE/EPC), Benjamin Todd (TE/EPC), Jan Uythoven (TE/ABT) & Marc Vanden Eynden (BE/CO)