

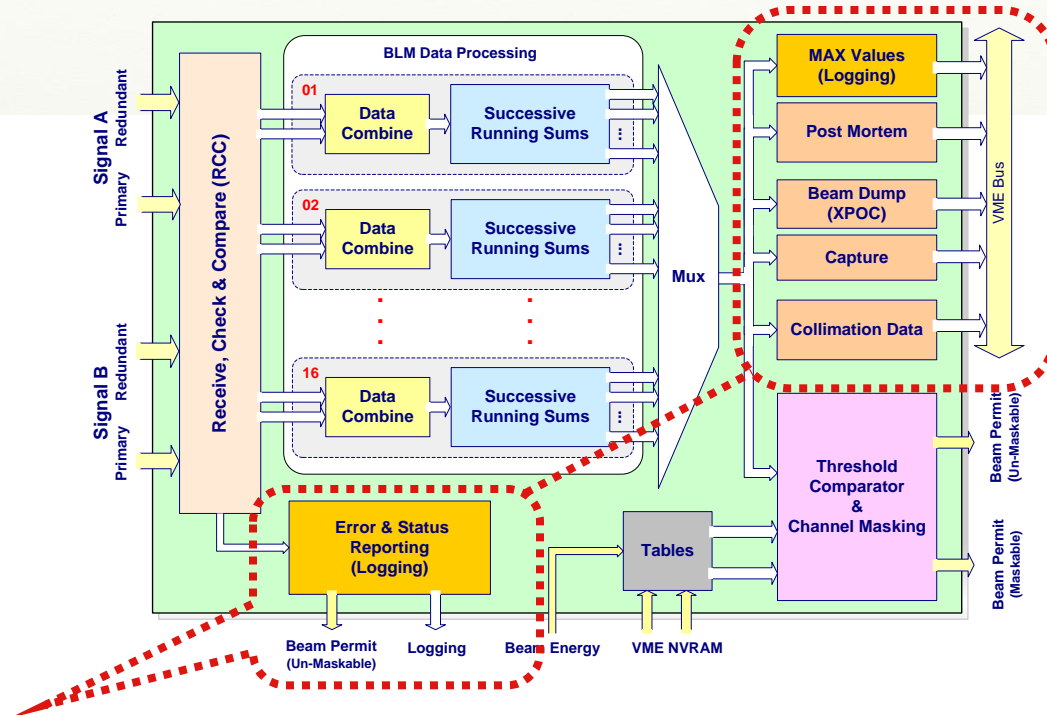
Beam Dump Requests

A decorative graphic consisting of several overlapping, wavy lines in shades of blue and cyan, flowing horizontally across the middle of the slide.

LHC BLM system audit – 08-11/11/2010

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Data Processing Overview



Preparation & Storage of data for external systems

- Produces an error and status report for the whole system.
- Calculates the max beam loss values for each channel.
- Keeps long buffers of acquired data.
- Keeps various buffers of integrated losses.

Database of events description

- Events are stored with
 - timestamps and IDs
 - LHC mode and classification

EVENT_CLASSIFICATION
 - MULTIPLE_SYSTEM_DUMP
 - SINGLE_SYSTEM_DUMP
 - OPERATOR_SWITCH

EVENT_CATEGORY
 - EMERGENCY_DUMP
 - PROGRAMMED_DUMP
 - PROTECTION_DUMP

- Operations have to sign each event and explain the results before continuing.

#	OPERATOR_COMMENT	SESSION_OPERATOR	PMA_CLASS	FIRST_BIC_in
260	Programmed dump after 19 h of stable beams. Dump was clean. The BLMs triggered due to sanity check timeout as soon as the beam permit was gone.	vkain	GPM1	First USR_PE
261	Power converter trip of RQ6.R5B1 during stable beams	vkain	GPM1	First USR_PE
262	Beam dump self trigger. Vacuum interlock on MKB due to bad vacuum acquisition.	vkain	GPM1	First USR_PE
263	Beam Losses due to uncaptured beam on MSK channel in IR2 during injection, triggered dump when crossing safe beam limit.	zerlauth	GPM1	First USR_PE
264	Injection losses with beams above safe limits.	stefano	GPM1	First USR_PE
265	Dump with RF off. RF was switched off for hump study.	vkain	GPM1	First USR_PE
266	Multiple FMCM triggers on electrical network glitch.	jwenning	GPM1	First USR_PE
267	Dump with OP switch at the end of physics fill.	stefano	GPM1	First USR_PE
268	Beam losses for B2 triggered by bad orbit during squeeze, due to a problem with the OFB	stefano	GPM1	First USR_PE
269	LHCb gave ready in ADJUST handshake, but was not ready. Velo was not fully out yet and dumped the beam.	vkain	GPM1	First USR_PE
270	was 4th inj beam1	papotti	GPM1	First USR_PE
271	bad orbit during squeeze	papotti	GPM1	First USR_PE
272	Funny loss in P2 with pilot circulating. Also one BPM in P8 had a high reading	wventuri	GPM1	First USR_PE

Done, ran 1 of 1 statements. Selected 496 records Script: 0.047 Secs

Selecting PM Events

- All events from this year
 - The BLM System was involved
 - Exclude tests
- Total = 496

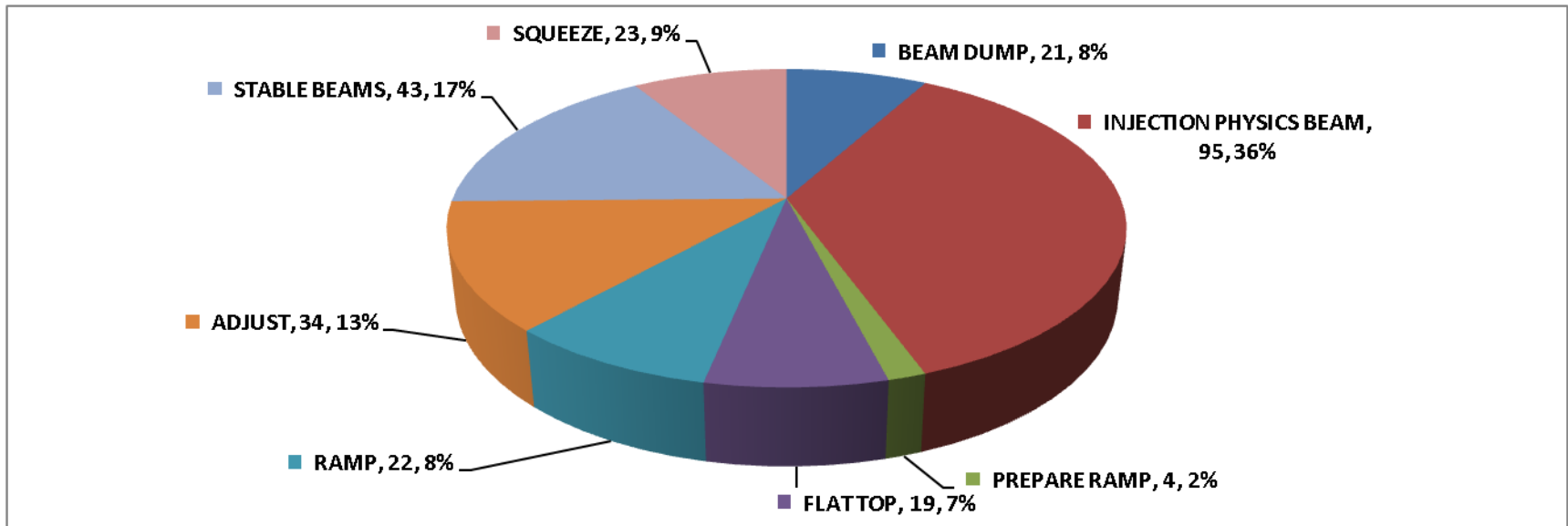
```
select * from PM_EVENT_OVERVIEW
where
    event_category not like 'TIMING_EVENT'          -- To exclude e.g. timing events, etc.. which are not real PM events but tests.
and EVENT_TIMESTAMP >= '28-FEB-10 02.24.19.243000 AM' -- Only use dumps of 2010 run
-- and
--         (TRIGGERED_BIC_INPUTS like 'Ch 4-BLM_%'
--         or TRIGGERED_BIC_INPUTS like 'Ch 11-BLM_%'
--         or TRIGGERED_BIC_INPUTS like 'Ch 4(BLM_%'
--         or TRIGGERED_BIC_INPUTS like 'Ch 11(BLM_%')
--         -- Choose only those where first was the BLM System
and
    (TRIGGERED_BIC_INPUTS like '%Ch 4-BLM_%'
    or TRIGGERED_BIC_INPUTS like '%Ch 11-BLM_%'
    or TRIGGERED_BIC_INPUTS like '%Ch 4(BLM_%'
    or TRIGGERED_BIC_INPUTS like '%Ch 11(BLM_%')
    -- Choose only those where the BLM System was involved

--and TRIGGERED_BIC_INPUTS not like 'Ch 4-BLM_MSX(L6.B1)%' -- Exclude those where the DUMP monitors are first
--and TRIGGERED_BIC_INPUTS not like 'Ch 11-BLM_UNM(L6.B2)%'

order by EVENT_TIMESTAMP desc          -- Order by timestamp
```

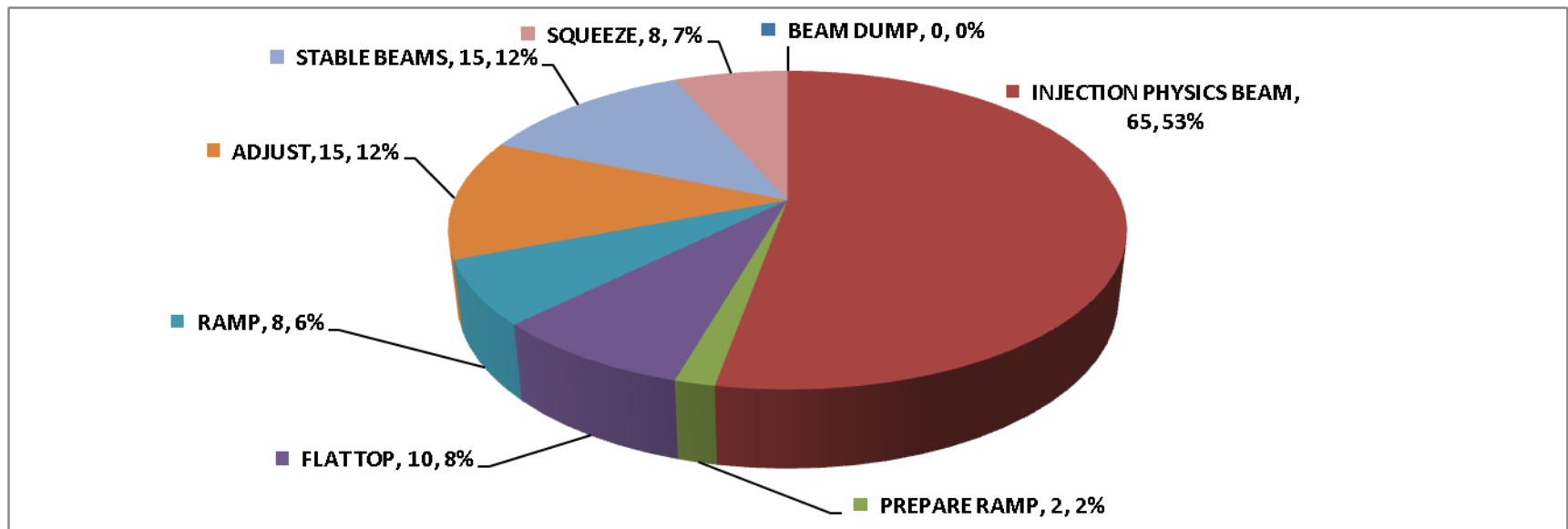
Multiple Systems agreeing

- 261 events with multiple systems that operations was stopped while going to physics mode.



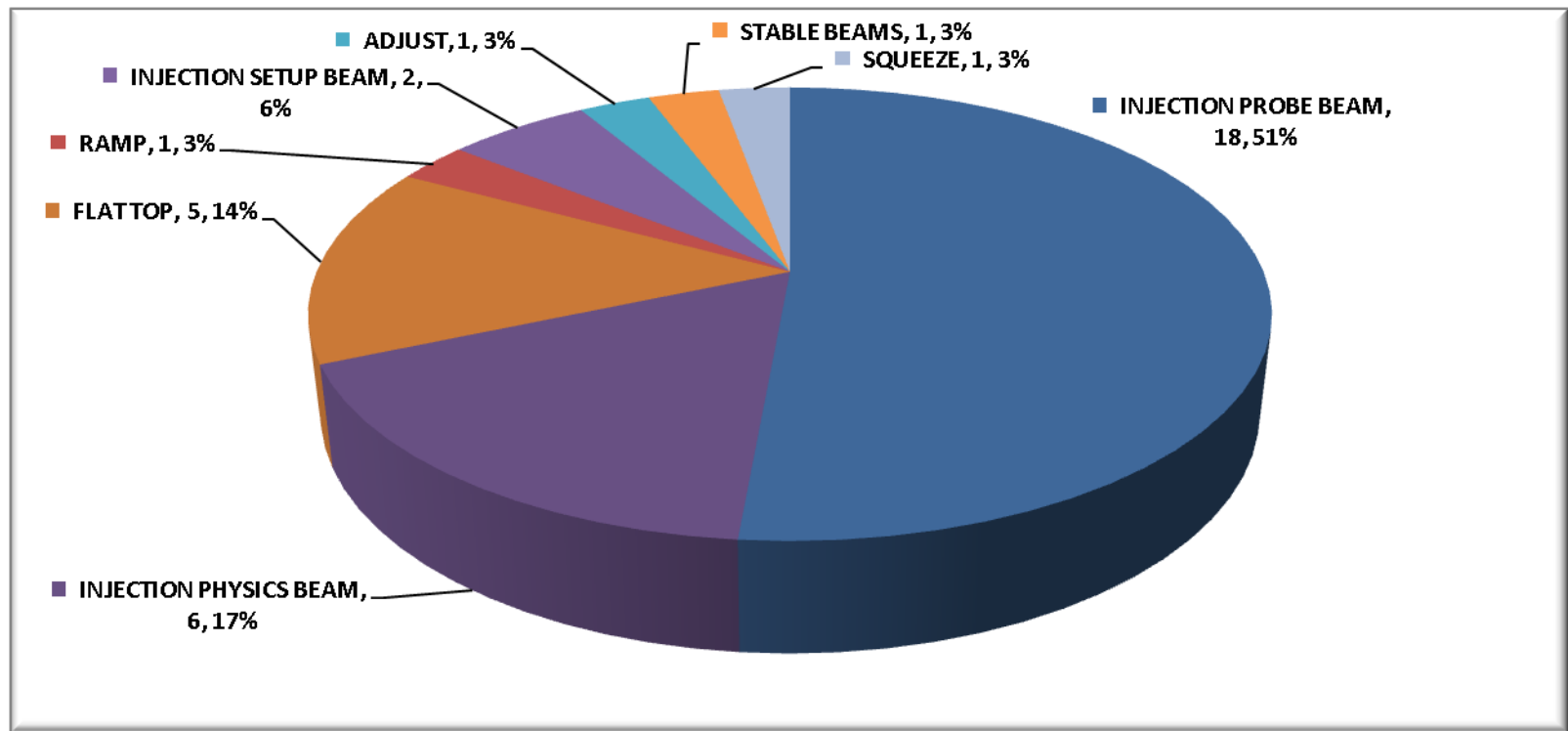
Multiple Systems w/ first the BLM

- 307 (out of 496) the BLM system was first.
- 129 operations was starting physics



SINGLE_SYSTEM_DUMP events

- 35 events only seen by the BLM system
- 15 of them in physics mode.



Visualisation of data

