ELENA Availability Statistics 2023

Considered Times

- Availability counting starts on physics start of ELENA
  - from 30-06-2023 00:00:00 to 13-11-2023 06:00:00
  - Delay of the start of physics due to water leak in quadrupole before beam commissioning not taken into account
  - Faults happening during beam commissioning also not taken into account
- LINAC4 dedicated MD (30/31-10-2023) excluded, no injector TS during physics period

System Downtime

Availability

90.2%

Blocking Faults

408

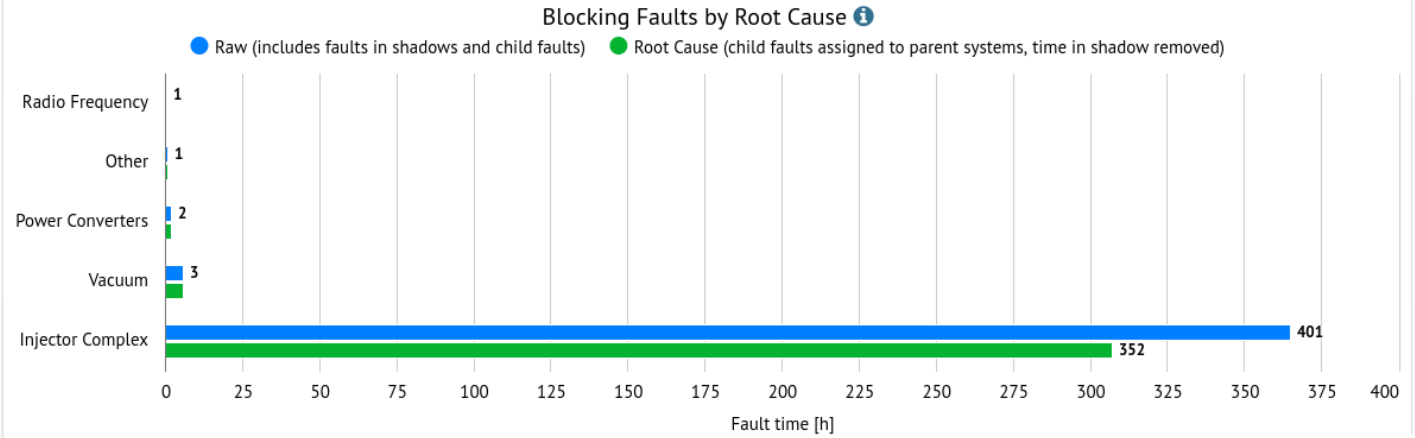
Total Faults

408

Fault Duration (overlap excluded)

315.6h

Blocking Faults by Root Cause



Without Injector Complex

Availability

99.7%

Blocking Faults

7

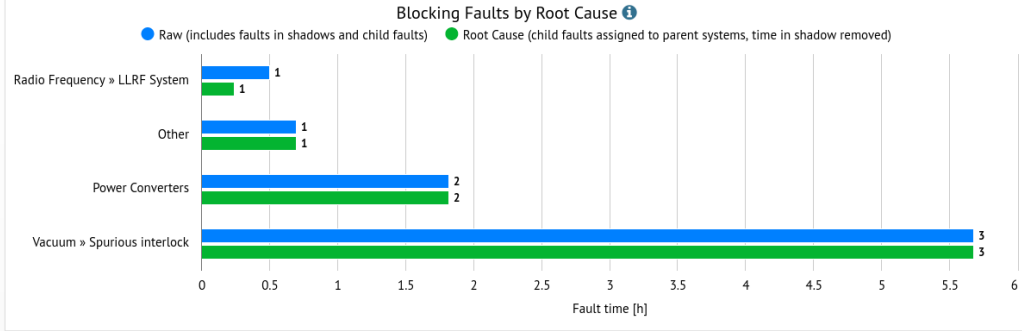
Total Faults

7

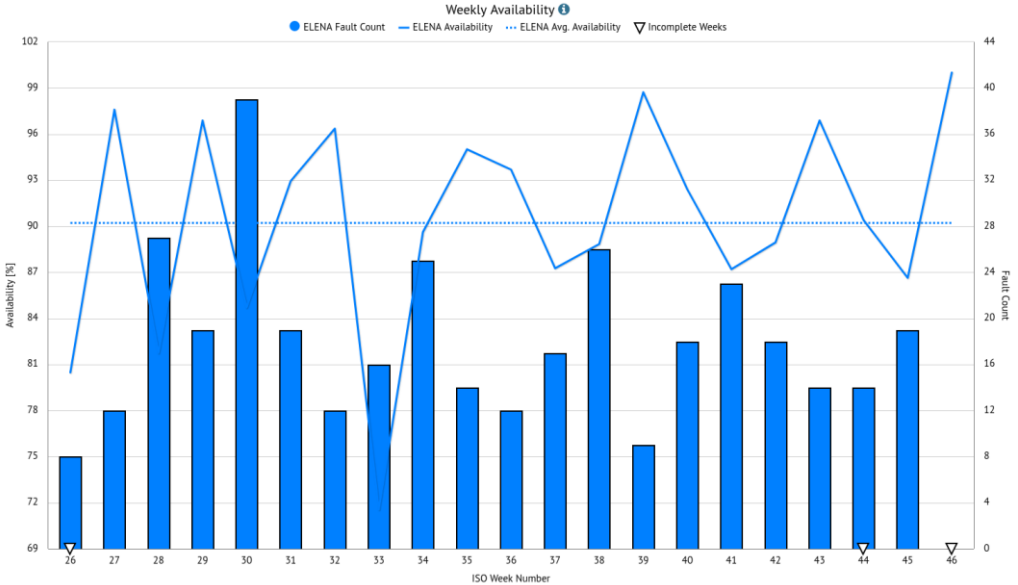
Fault Duration (overlap excluded)

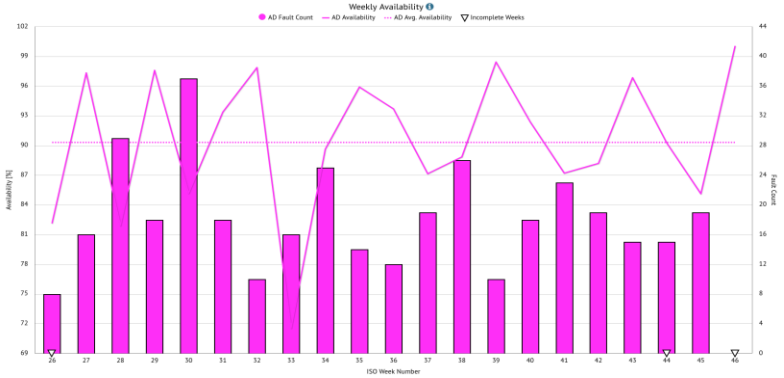
8.4h

Blocking Faults by Root Cause



Weekly Availability



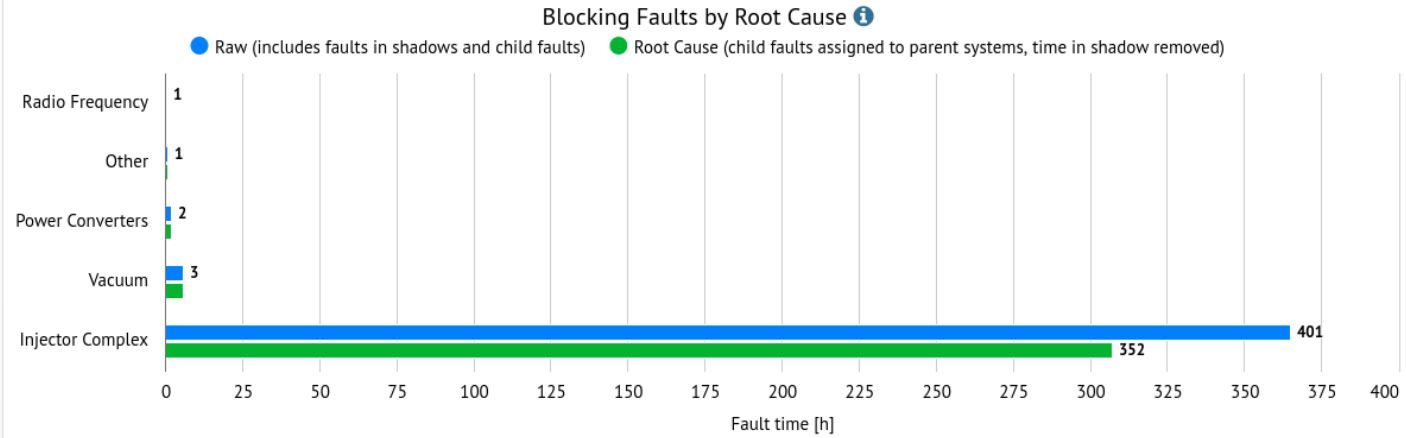


- Copy of AD weekly availability, ELENA had no more than 1 fault per week

System Downtime - Injector Complex

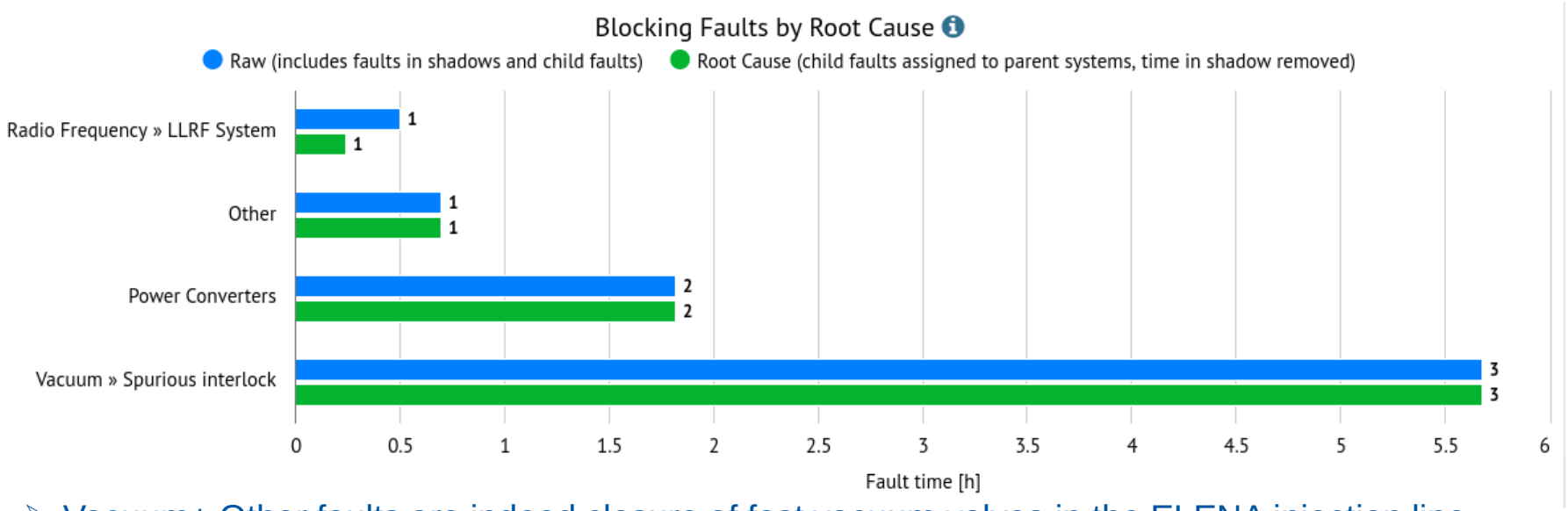
Availability	Total Faults	Fault Duration (overlap excluded)
90.2%	408	315.6h

Blocking Faults
408



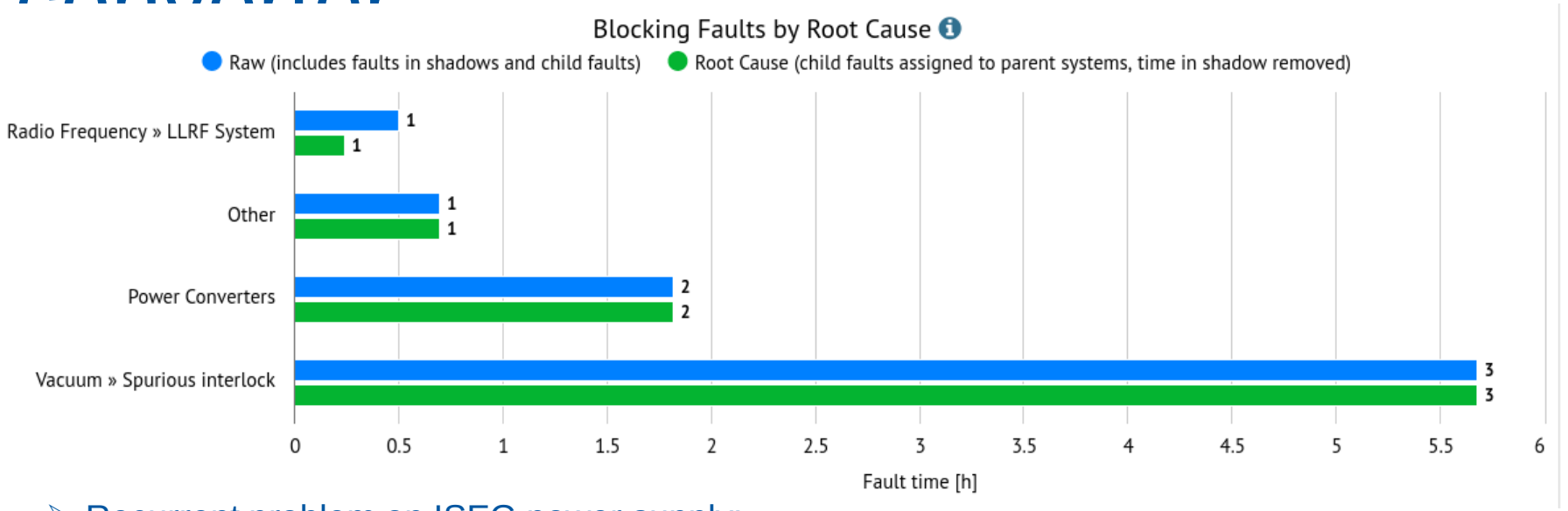
- Injector complex is the sum of AD injectors + AD faults

System Downtime - Vacuum



- Vacuum+ Other faults are indeed closure of fast vacuum valves in the ELENA injection line
- 2 different causes:
  - 1 event due to mismanipulation in the ion source (Other)
  - 3 events due to pressure rise in LNE07 (BASE) line
    - Origin of the spike still under investigation, suspect a sparking in electrostatic element but not confirmed

System Downtime – Power converter



- Recurrent problem on ISEG power supply:
  - Power supply frozen, need a local power cycle to restart
- Downtime registered only when user is affected → real occurences underestimated
  - Most of the time tranparent if PC is frozen at the « right » value
  - Noticed only when scanning end of line position

Summary & Conclusion

- Excellent availability of ELENA (> 99%) without injector complex
  - ELENA is still a new machine, no big maintenance issue yet
- 2 recurrent faults:
  - Closure of the fast valves in injection line → not understood yet
  - Loss of communication of ISEG power supply (electrostatic transfer line elements) → know issue followed-up by EPC
- No solution found/proposed yet for the 2 problems, so we will probably have to leave with it next year