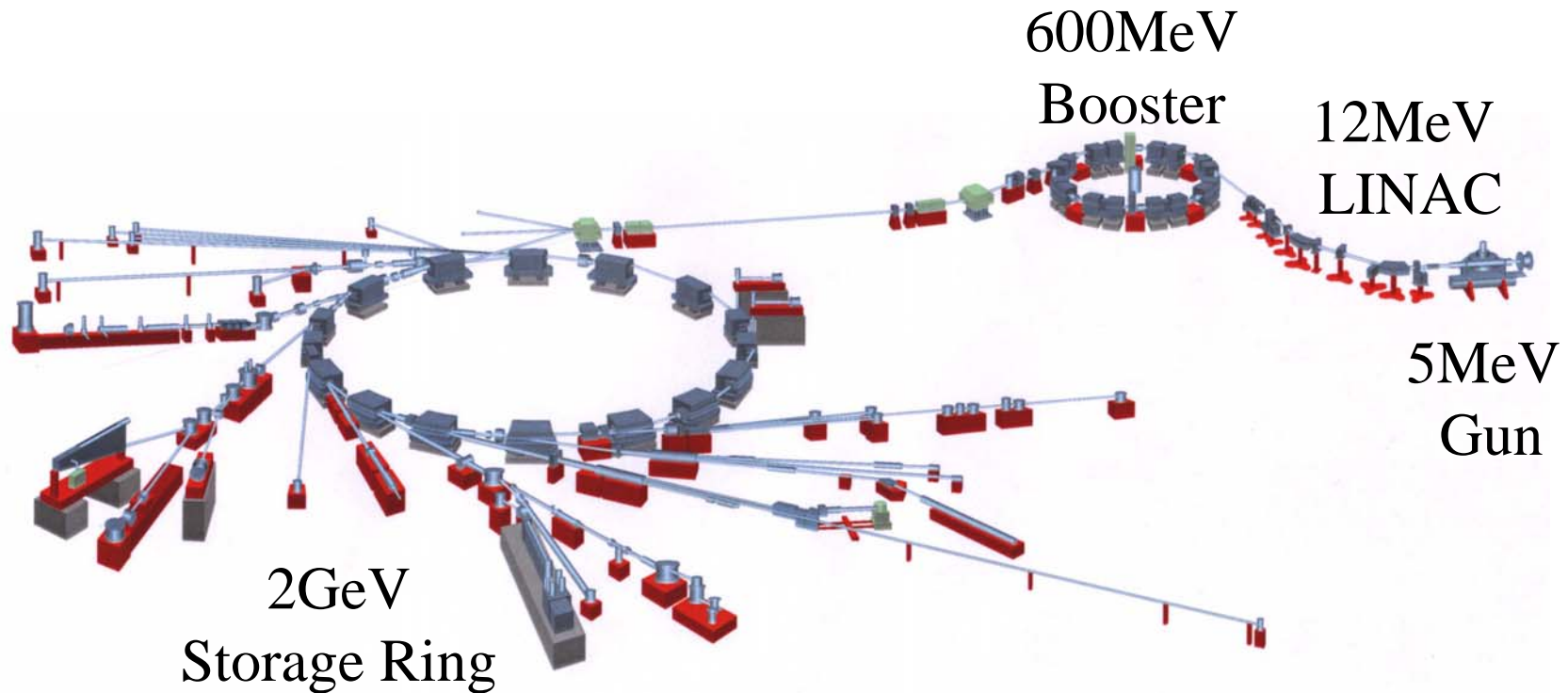


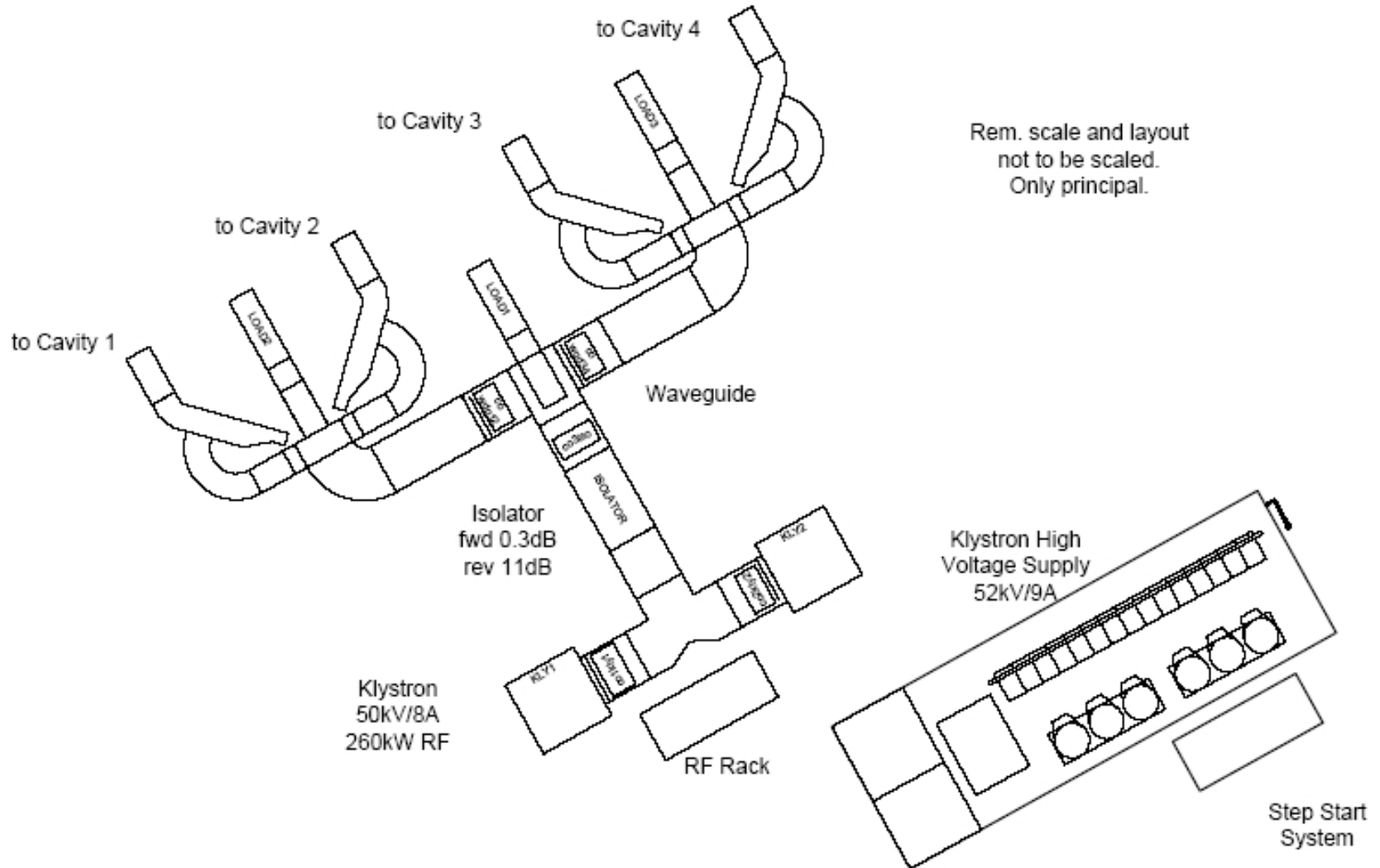
SRS Status

- The RF system
- The performance of the SRS
- Recent upgrades
- Upgrades planned
- Conclusion

The SRS machine



RF System



KSU

- 86 modules up to 700V
9amp to make 50KV
- 3 – 5 KHz operating
frequency
- 100KHz module cycling
- Closed cubicle with air
conditioning
- 4 modules redundancy



KSU fire

- December 03
- 50% of control fibres,
5 PSM modules
- System repaired in 2
days (with
manufacturer help)
- Smoke/arc detectors
needed in sealed
cabinets !



Cause = loose electrical connection
(after 16 months operation !)

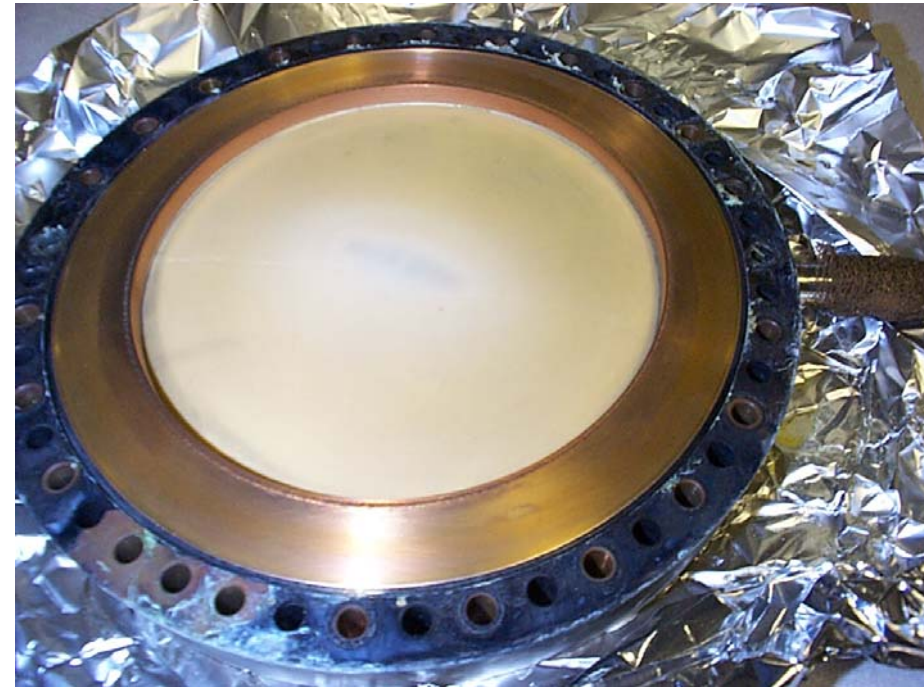
KSU faults

- A second burning incident occurred Aug 04 after a shutdown
- Caused by demin water ingress
- Canal cooling causes problems
- KSU 99% up time



RF Cavity

- April 04 Cavity 1 window failed
- First window failure for 20 years

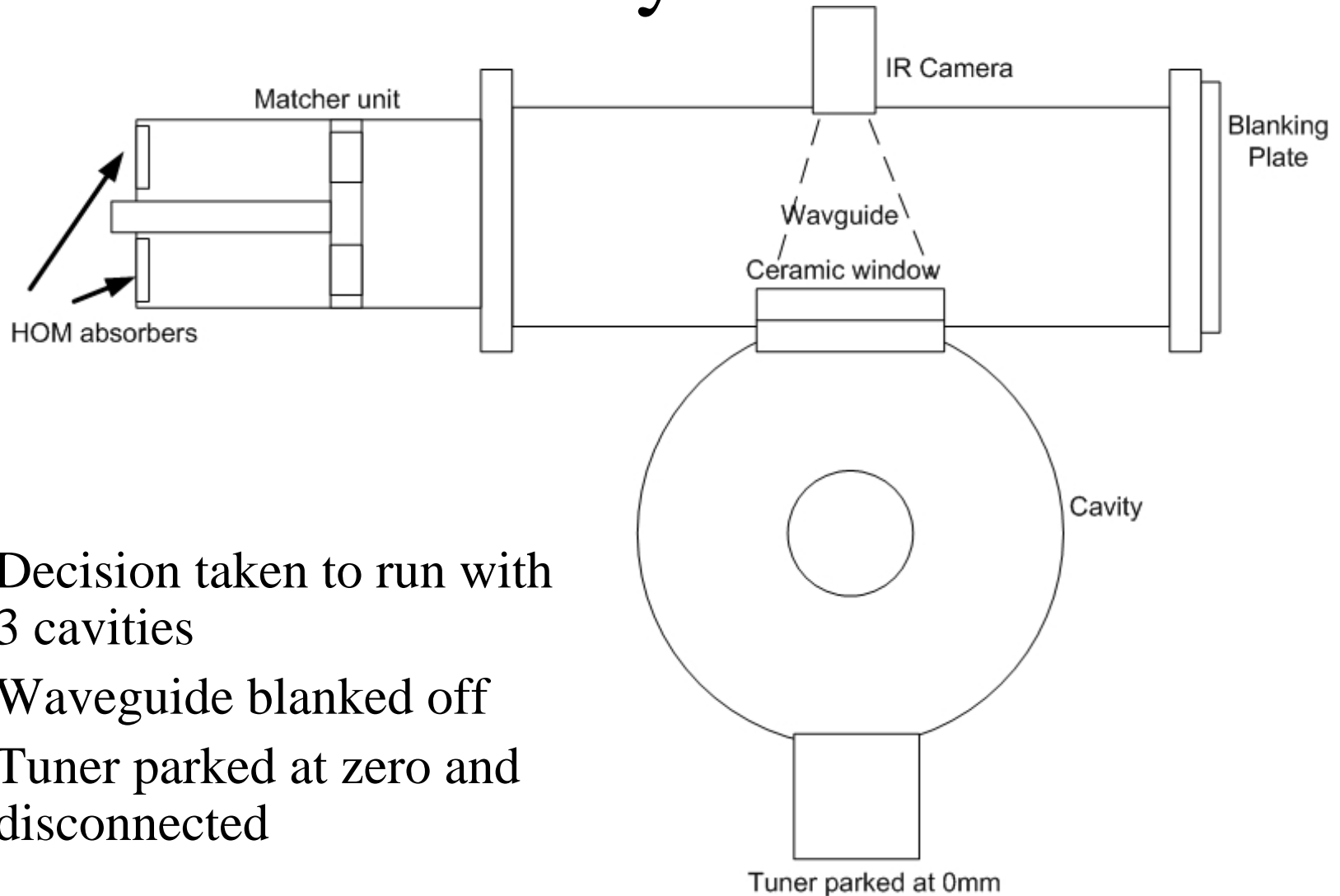


Cause unknown but signs of Multipactor on every ramp of the machine for last year

Cavity window

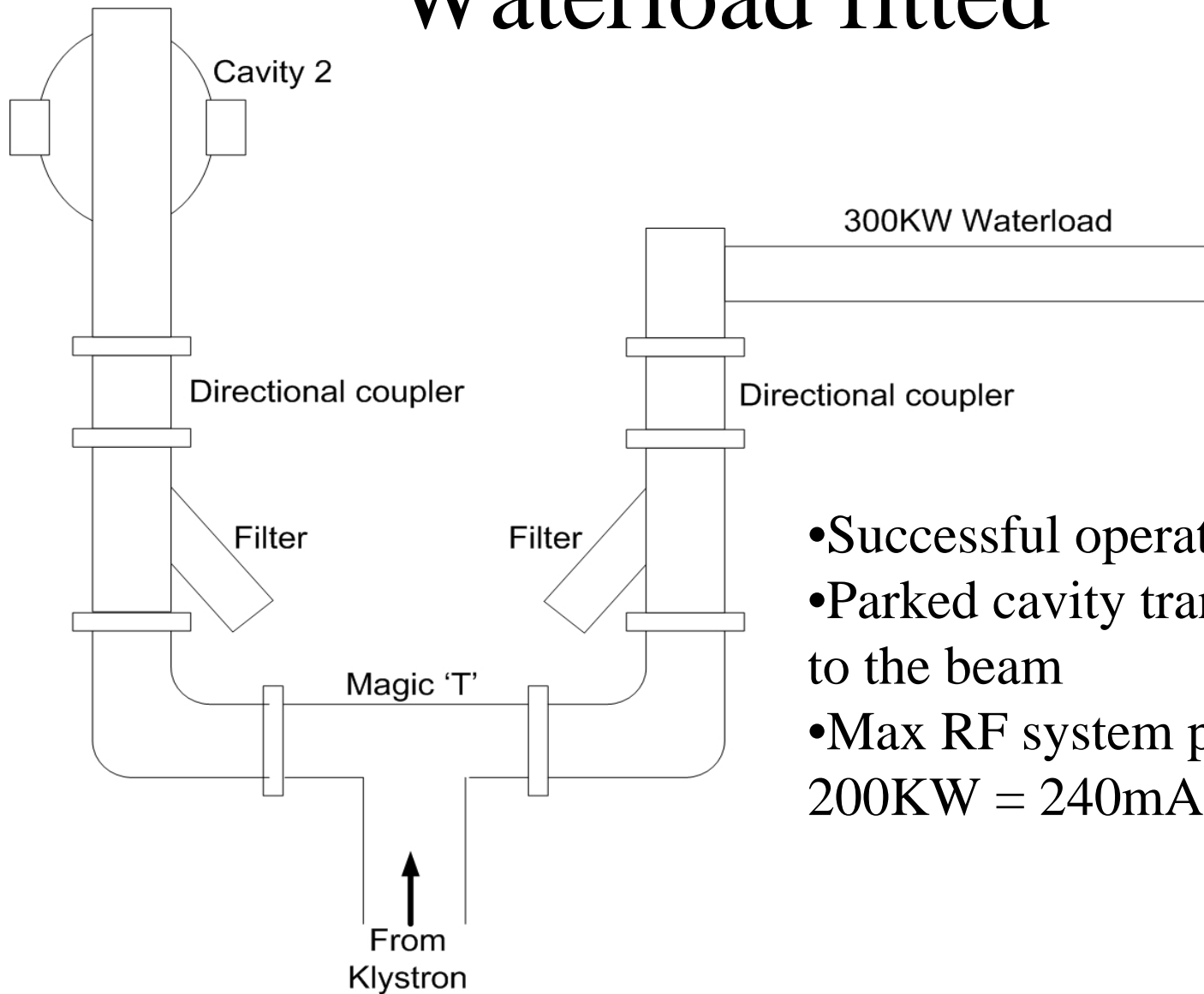


Cavity 1



- Decision taken to run with 3 cavities
- Waveguide blanked off
- Tuner parked at zero and disconnected

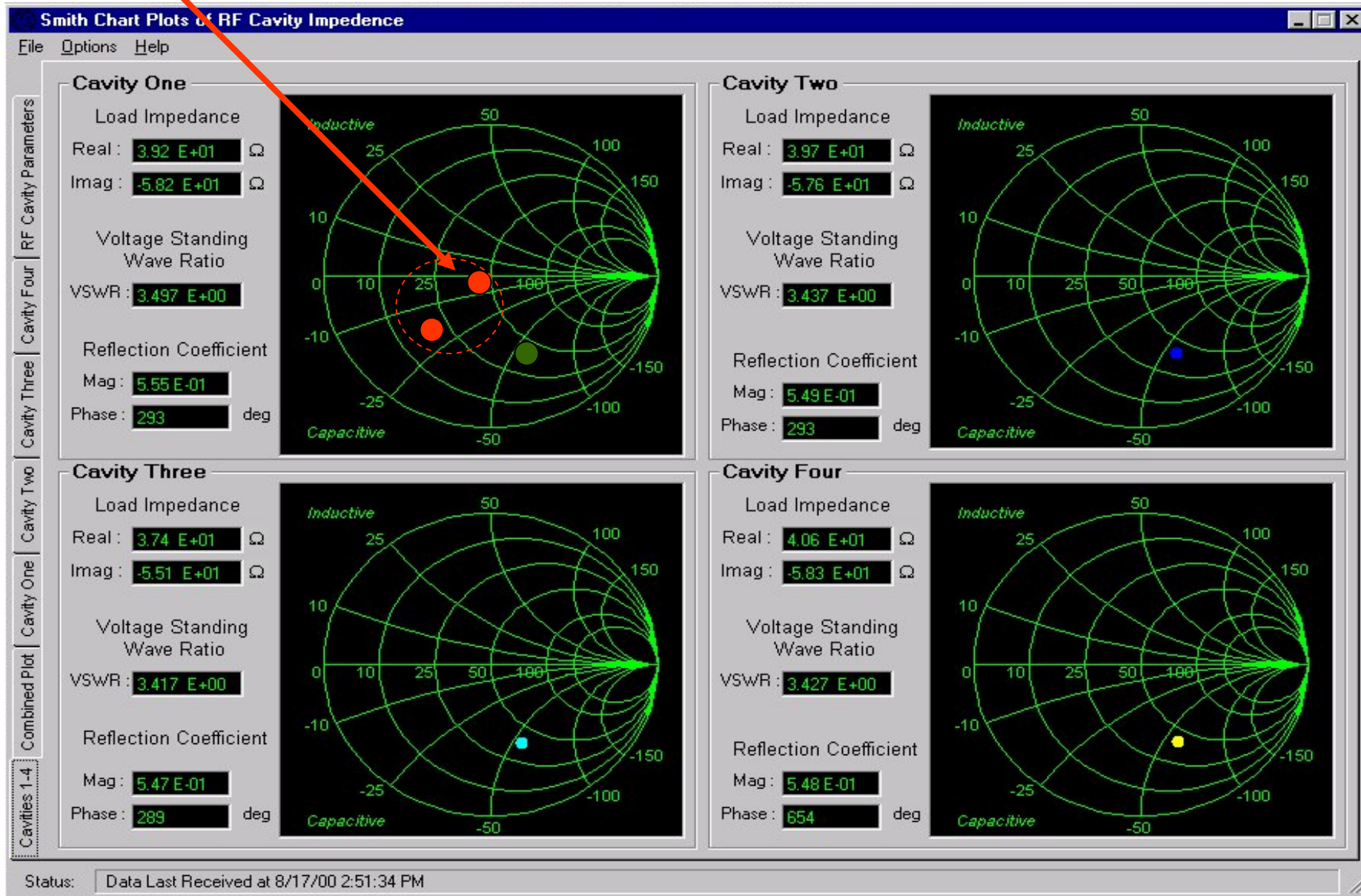
Waterload fitted



- Successful operation
- Parked cavity transparent to the beam
- Max RF system power
 $200\text{KW} = 240\text{mA}$

Impedance display

50 Ohm Load



Waterload failure

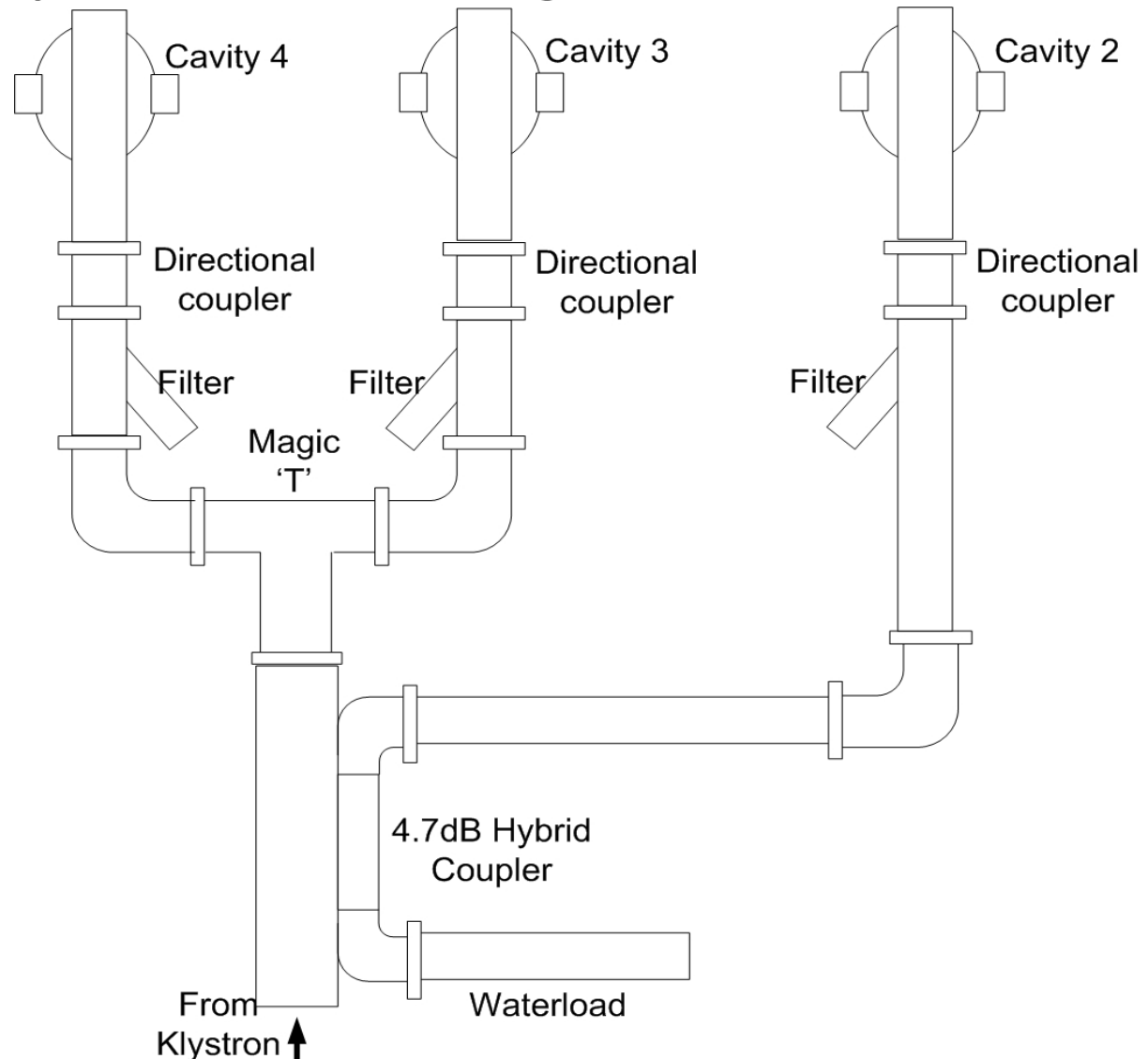
- 300KW waterload in place of Cavity 1 fails after 3 months operation
- Loads re-configured



Cause = RF joint not tight in high field area

RF system changes ?

- Decision to remove cavity 1 under discussion
- Hybrid power splitter 4.7dB
- 1.2MV total needed for SRS
- Less machine impedance
- Investigation needed

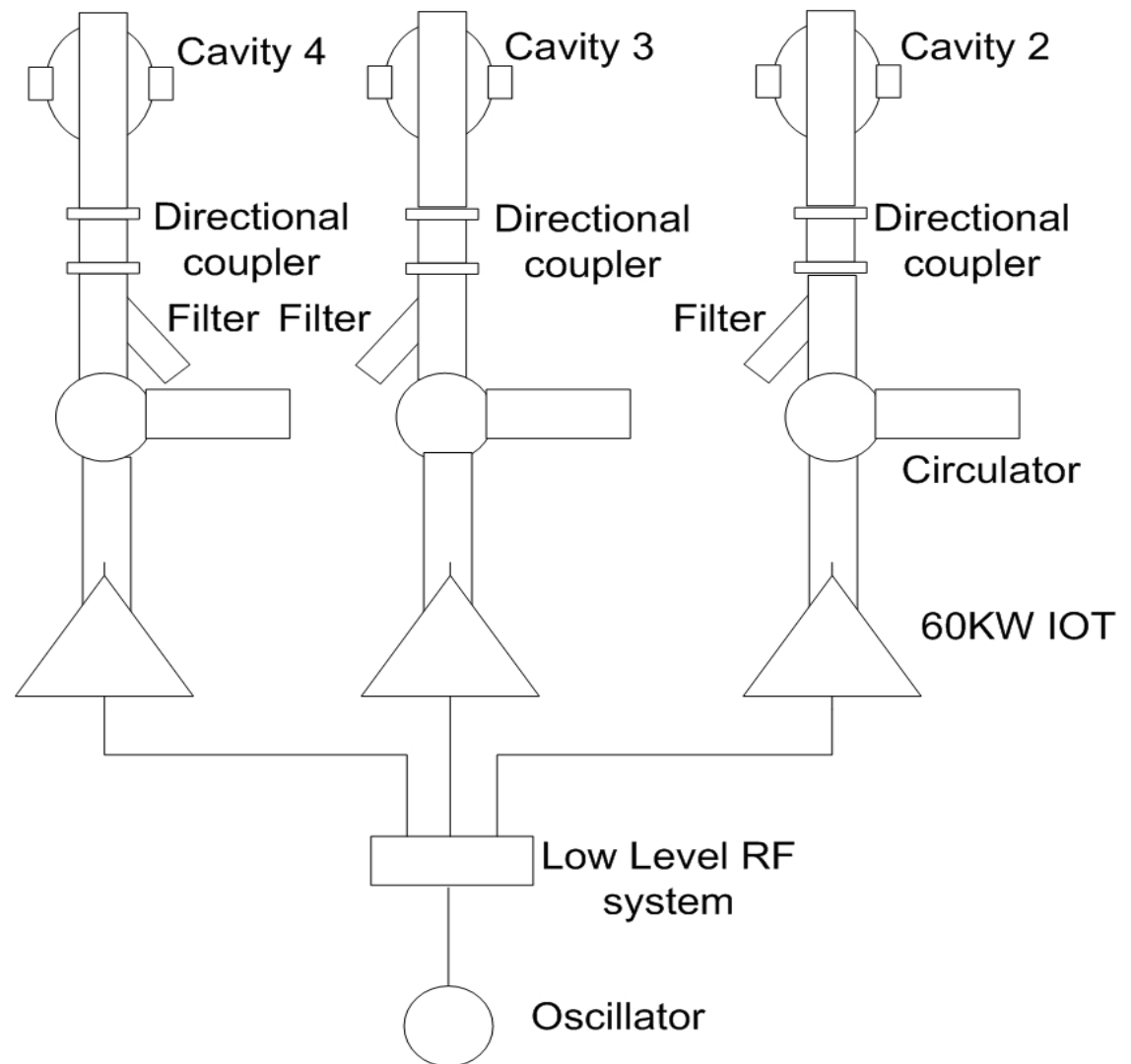


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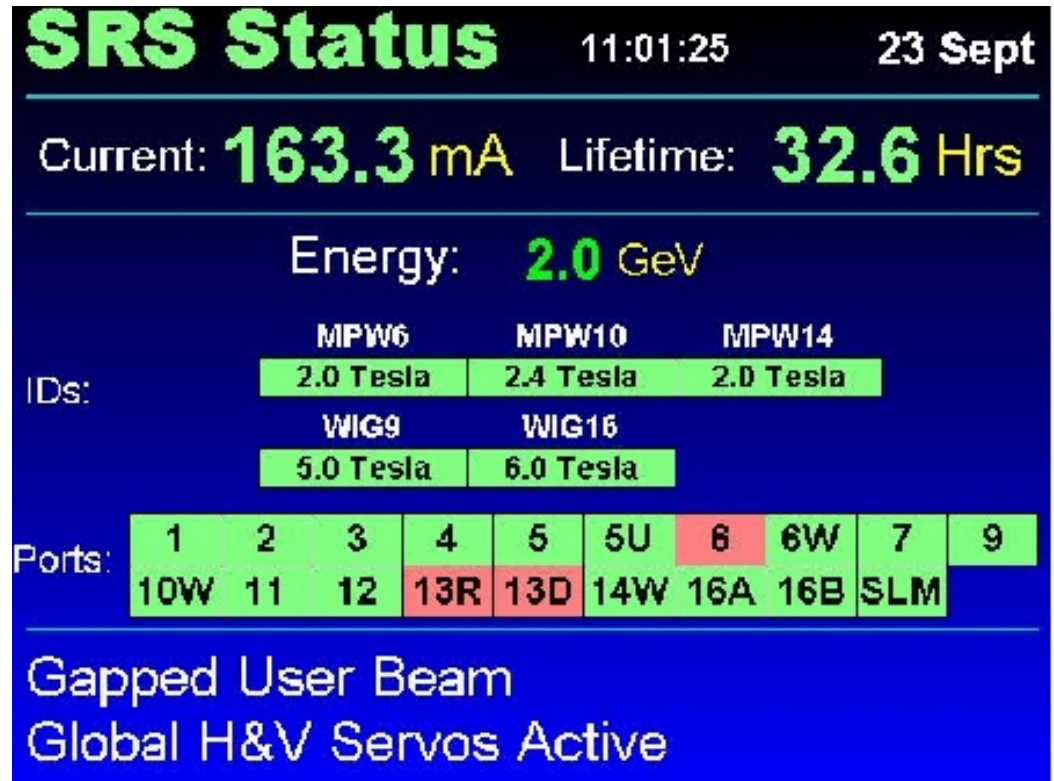
3 IOT scenario

- Change Klystron – 3 IOT's
- Would have to be cheaper than new klystron
- Eliminate cavity crosstalk



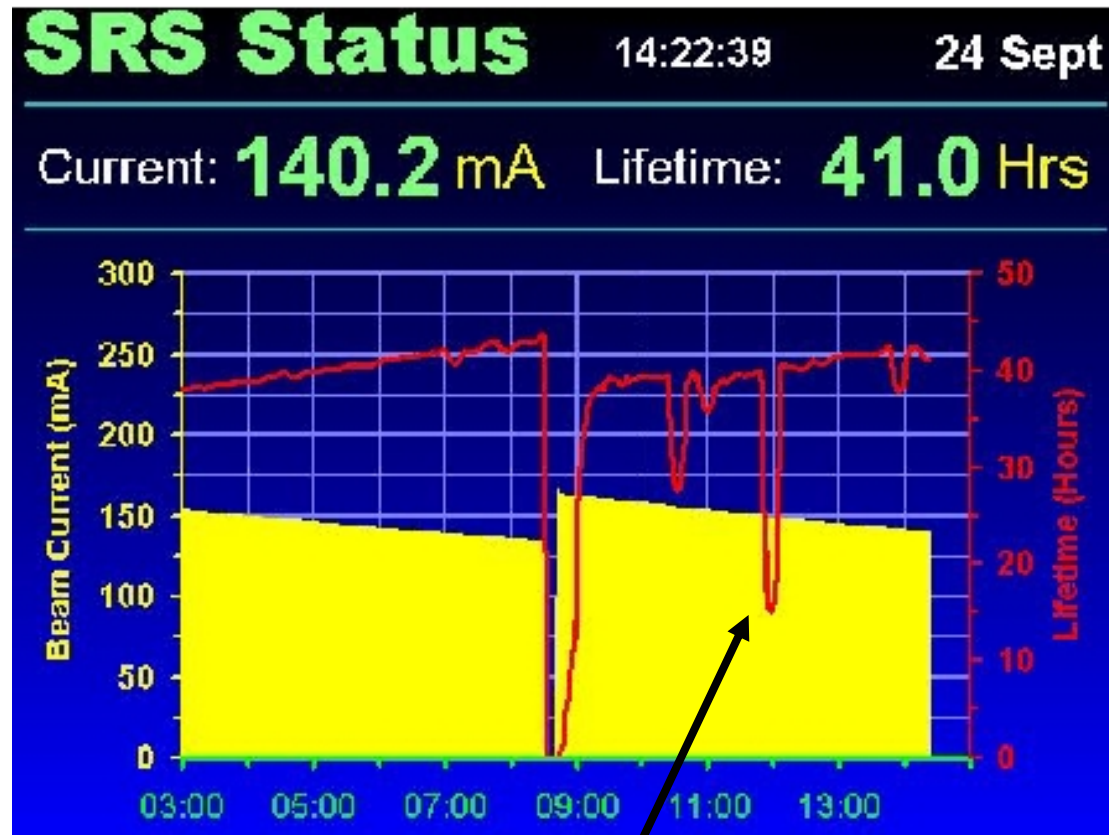
Current SRS Status

- 2GeV 250mA, currently limited to 180mA
- 30hr lifetimes, 40 minutes to refill
- 95% availability, most months !



SRS Status

- Machine not gas limited ?
- Lifetime issues limiting current since start up 09/04
- Unstable operation at high currents, RF system dependant
- Possible HOM ? RF phase issues



15Hr

SRS performance 2003/4

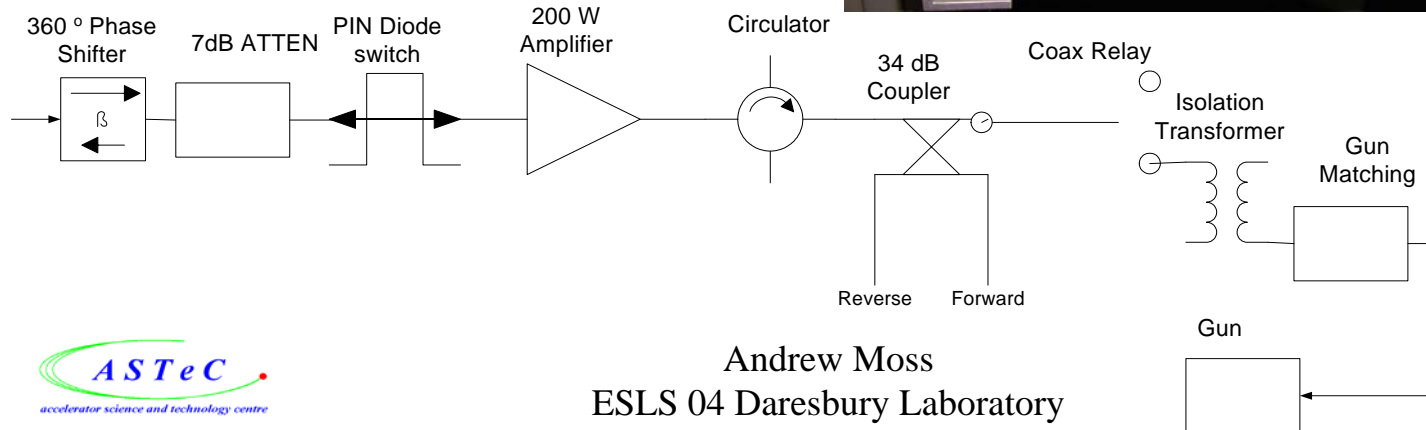
SUMMARY TABLE			
	Multibunch	Singlebunch	Total
Scheduled Hours	4896	328	5224
Achieved Hours	4221	278	4499
Start-up and Commissioning			680
Number of User Fills	500	22	522
Shutdown Hours			2320
Injection Hours			392
Fault Hours			333
MB Operating Efficiency (%)			93.71%
SB Operating Efficiency (%)			90.59%
Mean Time Between Failure (MTBF) Hours			38.13
Mean Time To Repair (MTTR) Hours			2.05
Beam Studies			536

- Operating hours up by 1600 to 5224
- Operating efficiency up 6% to 93%
- Mean Time Between Failures up by 54%
- Mean Time To Recover down by 20%

Biggest change = KSU operation

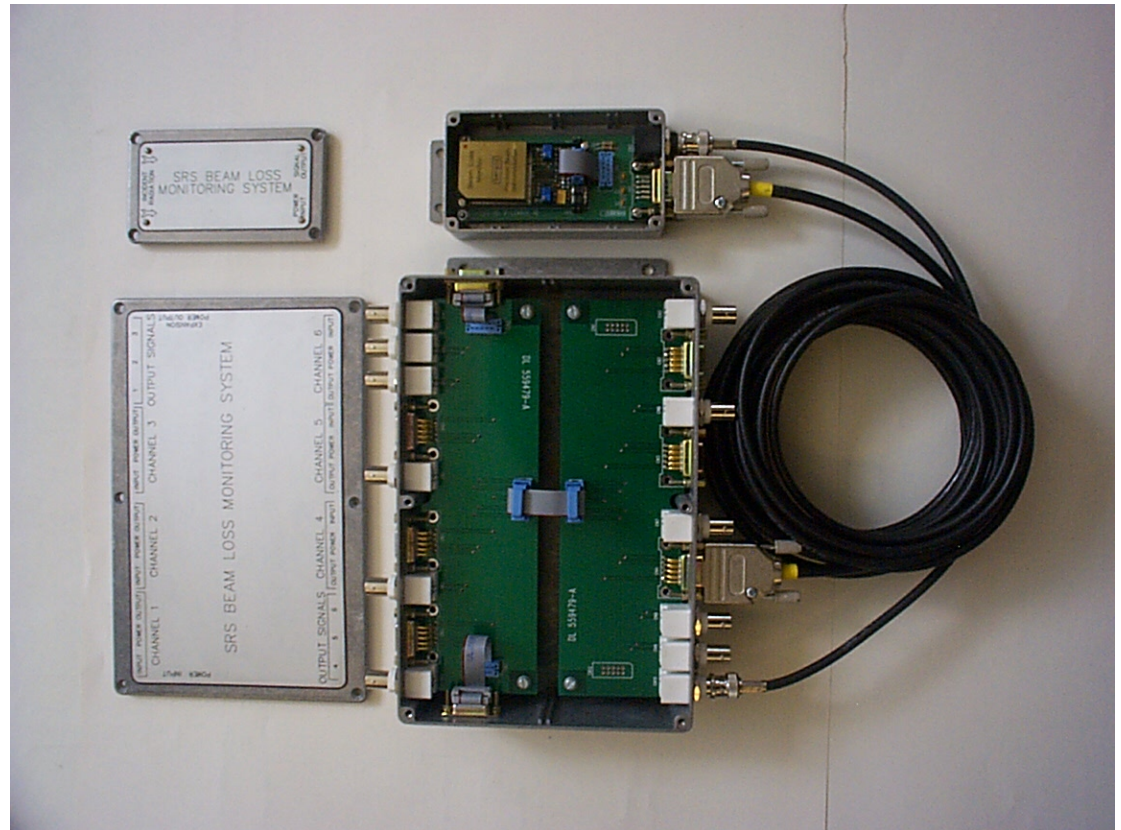
Recent upgrades

- Linac drive RF 400W 3GHz 4uS amplifier replacing drive Klystron
- Gun RF 200W 500MHz 1uS amplifier replacing : -



Future upgrades

- Bergos beam loss monitors installed every straight. starting Oct 04
- New Bergos BPM system updates at 5Hz
- Vertical Polarisation Undulator in straight 5 Oct 04 under user control
- EPICS voltage feedback for RF system



Conclusion

- In general SRS performing well for a 24 year old machine
- Many upgrades done and still to be done
- RF system very reliable since KSU installed
- Cavity 1 issue to be resolved
- SRS to continue operating for how long ?