

# XBOXes Update

17/07/2019

XBOX team

# XB2 Summary

- Currently at  $\approx 8\text{MW}$  in each line and ramping.
- Modulator voltage at  $1100\text{V}$  ( $\approx 370\text{kV}$ ) and we thought the klystron was saturating at  $\approx 17\text{-}18\text{MW}$ .
- According to gain curves provided by CPI we should get the following:
  - $350\text{kV} \Rightarrow 12\text{MW Max}$
  - $375\text{kV} \Rightarrow 22\text{MW Max}$
- Gerry suggested checking the alignment of the klystron and RF pulses. This has now been adjusted and we are in agreement with the CPI curves. (Thanks Gerry)

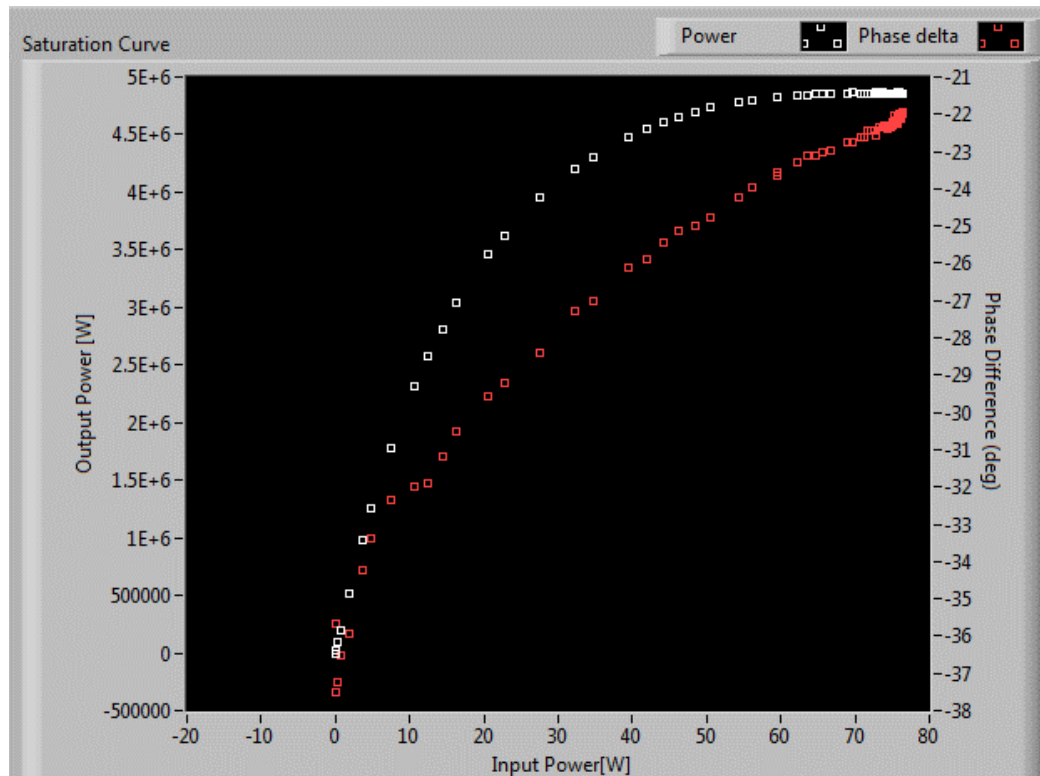
# XB3 Summary

- Klystron A
  - Voltage increased to 943 V from 920 V
  - Filament current increased to 11.2 A
- Klystron B
  - Voltage increased to 970V from 950 V
  - Filament current increased to 10.4 from 10.2 A
- Klystron C
  - Voltage increased to 950 V from 930 V
  - Filament current increased to 11.1 A from 10.7 A
- Klystron D
  - Voltage increased to 965V from 930 V
  - Filament current increased to 10.3 A
- XB3AB:
  - Increased klystron perveance
  - Trying to ramp up to 38.5MW
  - Line1 –
  - Line2 -
- XB3CD:
  - Barely pulsed this week due to vacuum leak in load.
  - Turned 1 yesterday!
  - Flat running at 35MW 150ns.
- Racks overheated but didn't turn off the PXI however RF stopped due to chiller interlock.

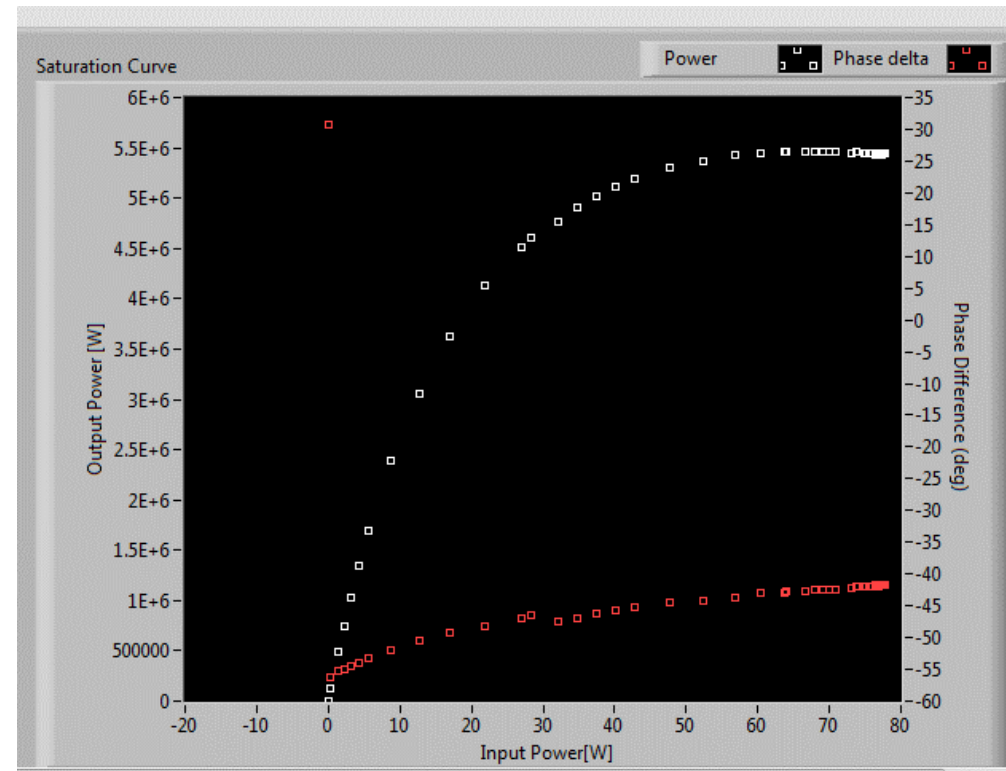


# Klystron A

920 V

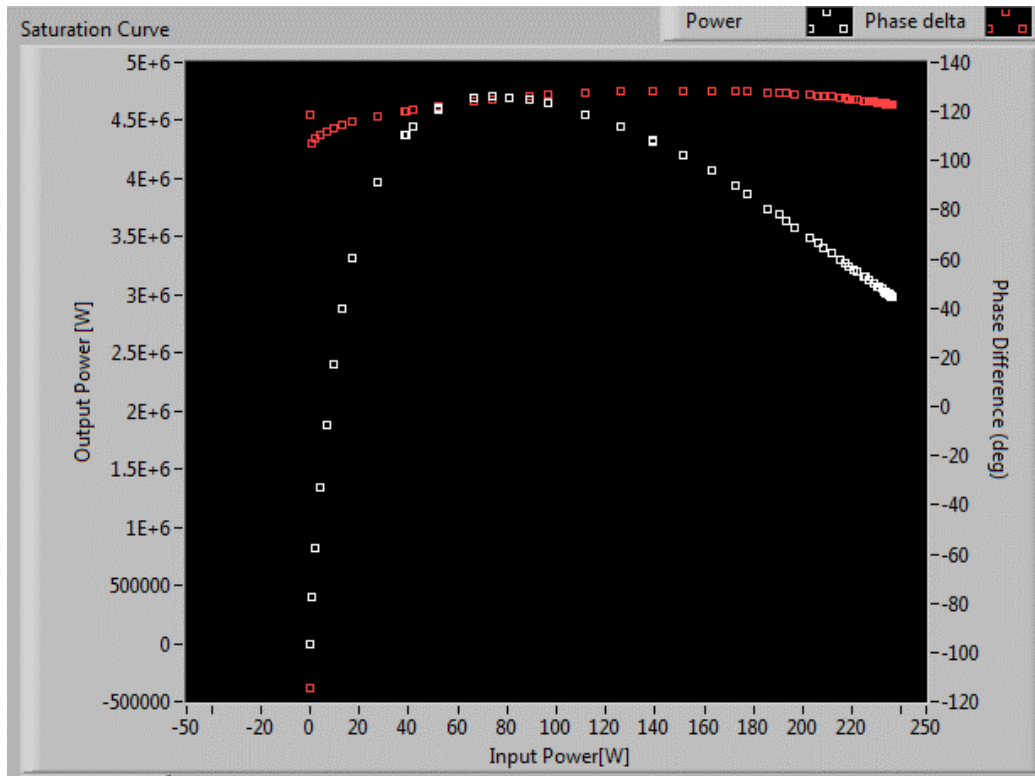


943 V

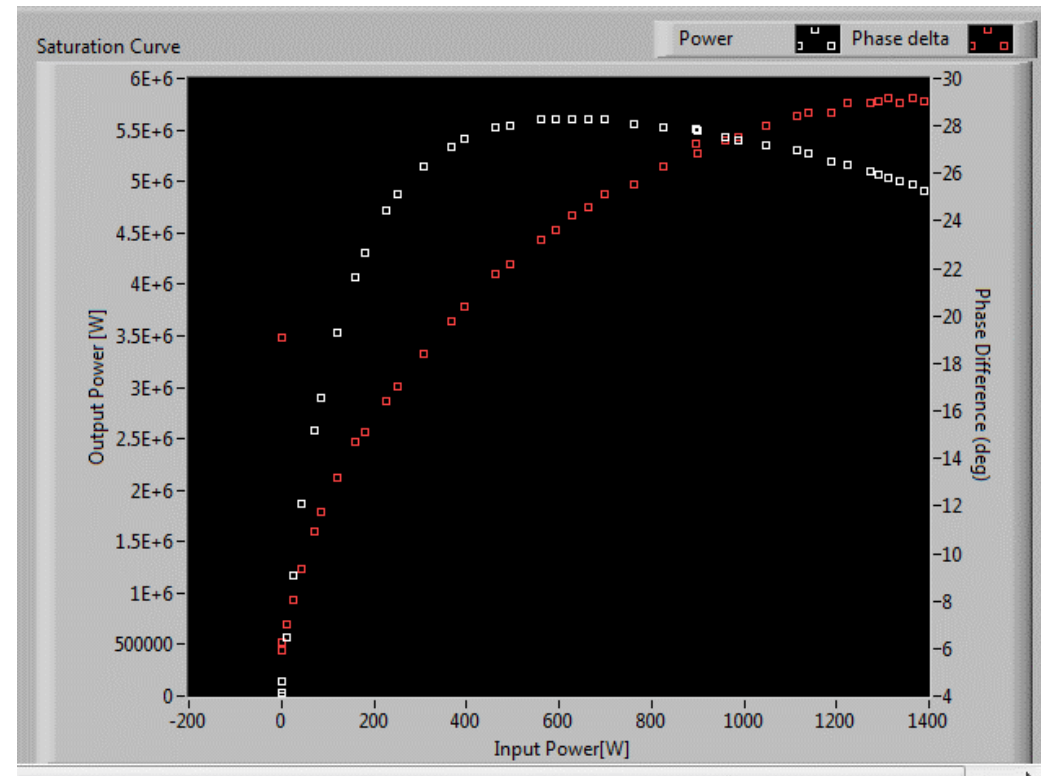


# Klystron B

920 V

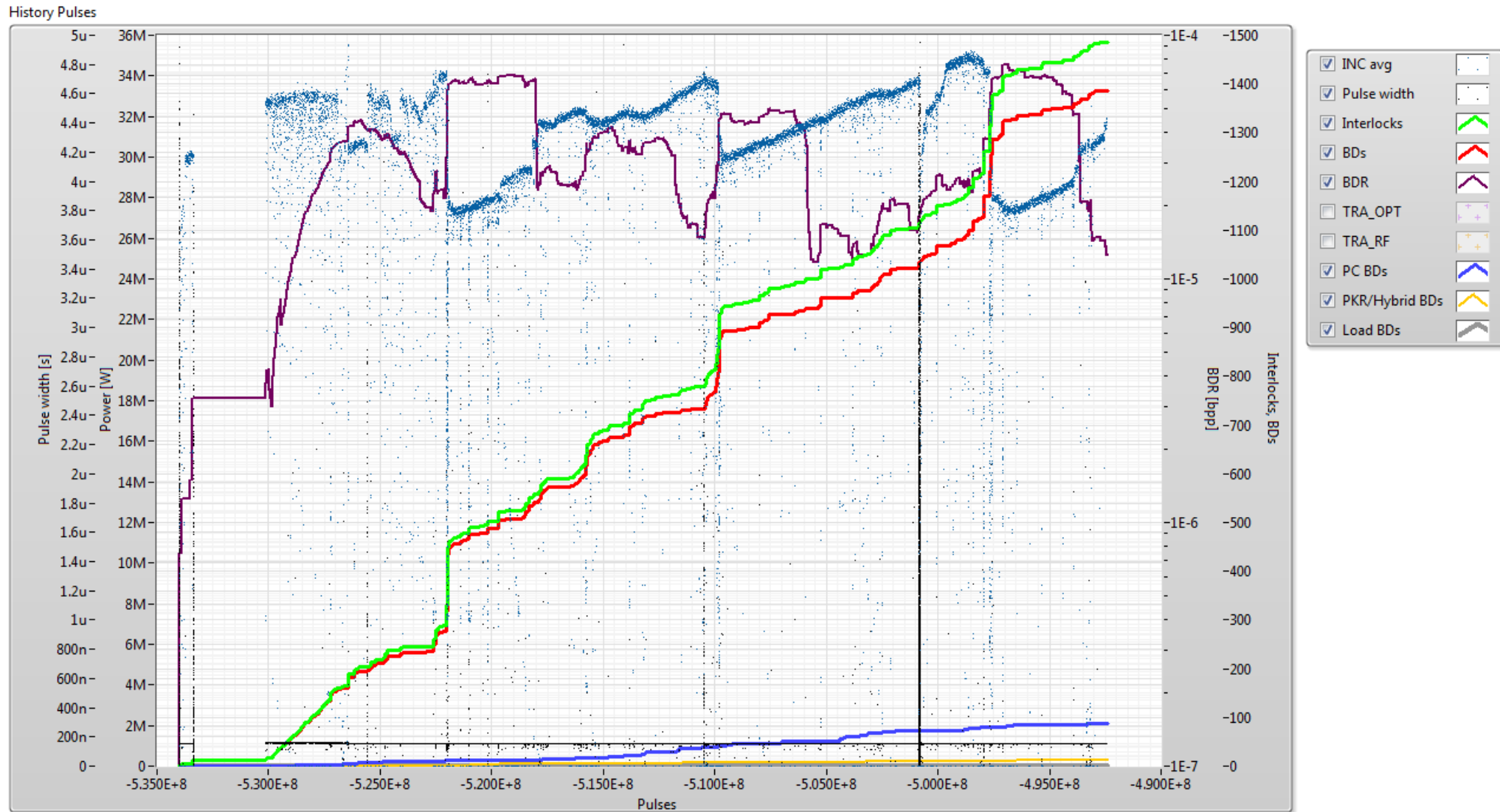


973 V



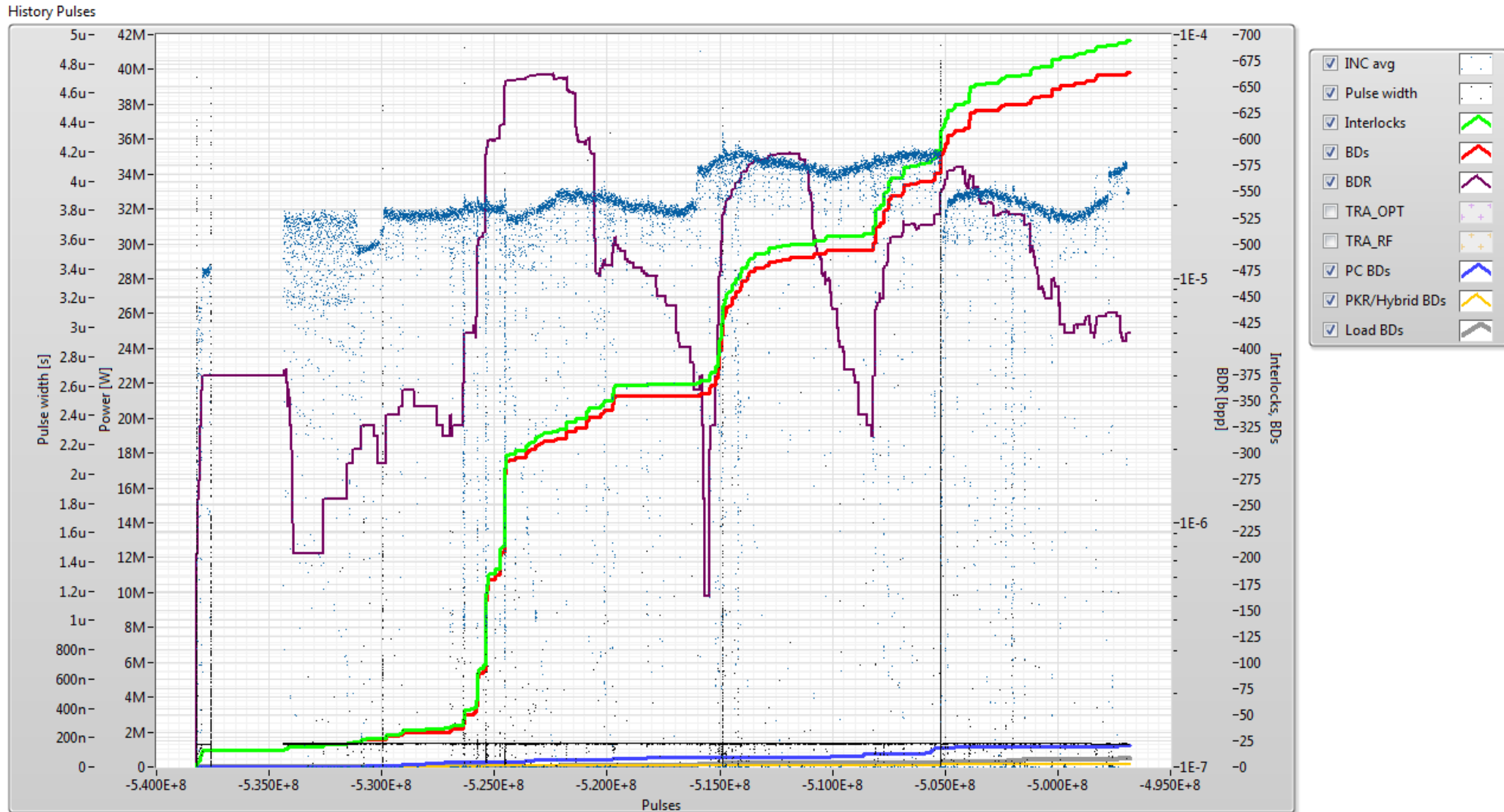
# XBOX3 Line 1 – T24\_N5

- LAST WEEK
- 1 WEEK HISTORY
- Continued ramping from 33MW
- Now at 35MW
- Breakdowns are in structure not pulse compressor.
- Increased klystron voltage last week from



# XBOX3 Line 2 – T24\_N4

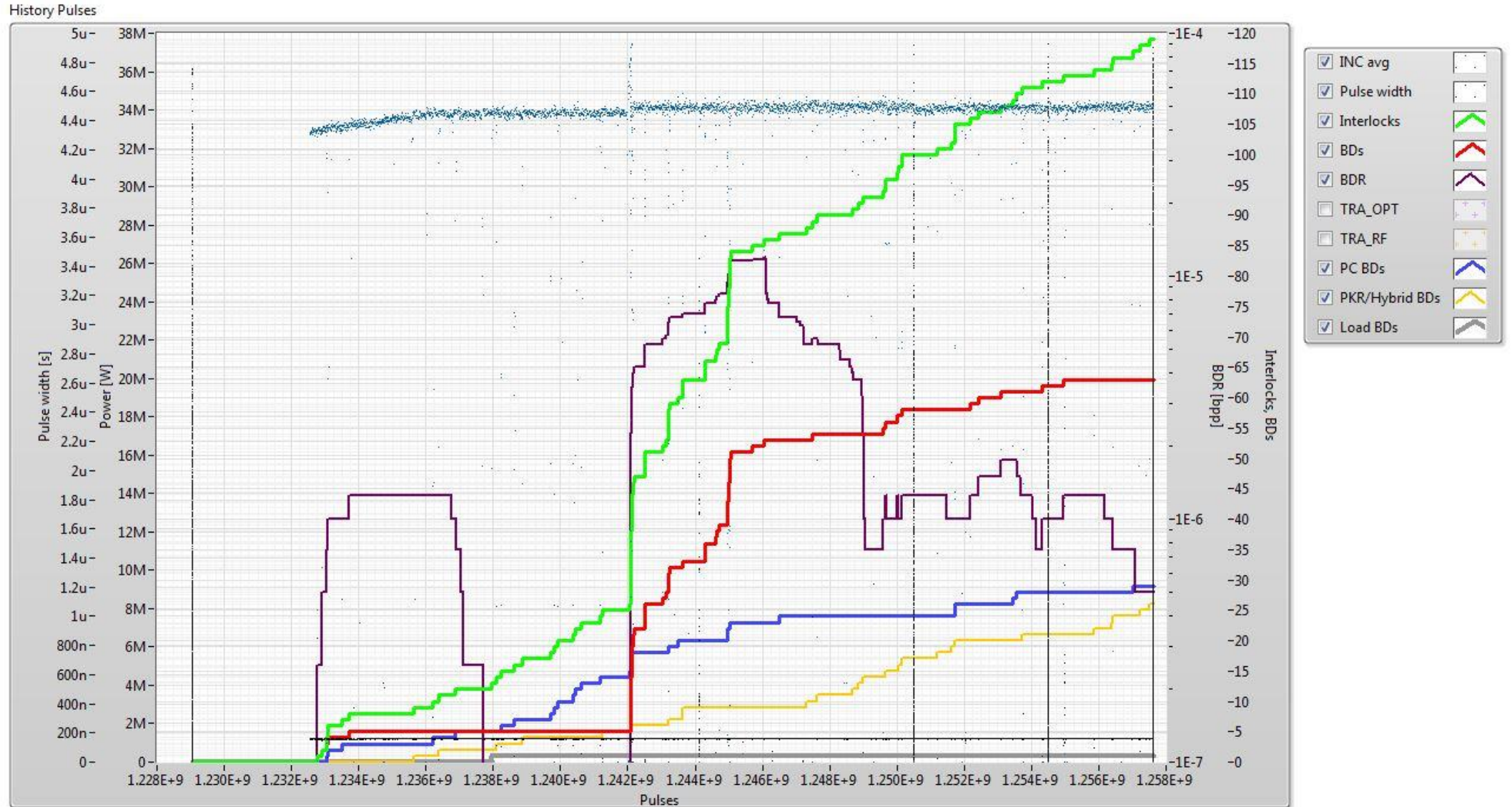
- LAST WEEK
- 1 Week History in PULSES
- Ramping from 33MW.
- 150ns
- Target is 38.5MW





# XBOX3 Line 3 – TD24\_BO

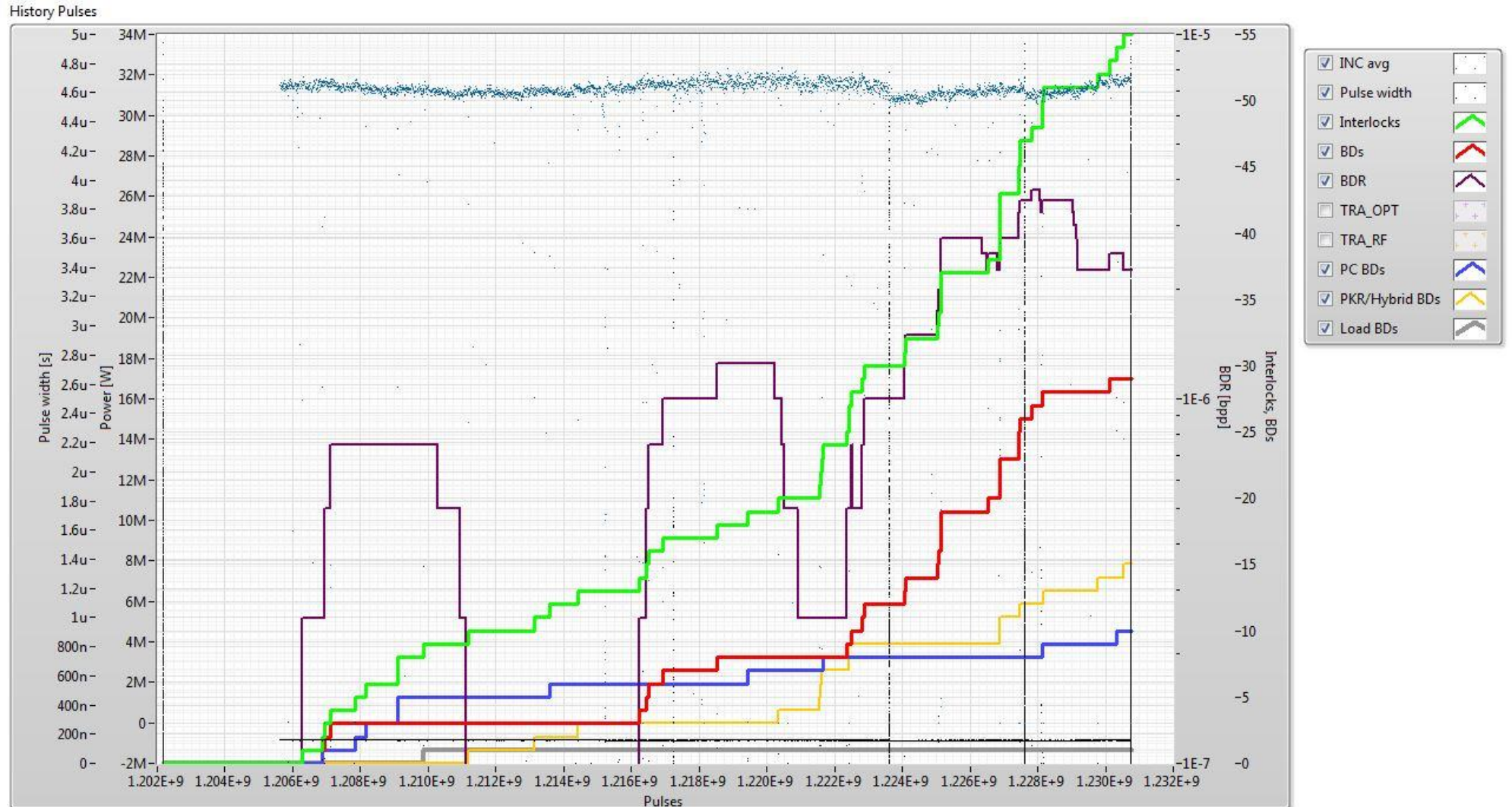
- 1 Week History in pulses.
- Last week there were around twice as many PC BD's as Structure BD's.
- Reduced the klystron pulse to limit PC breakdowns to  $2.1E-6$ .
- Flat running at 35MW





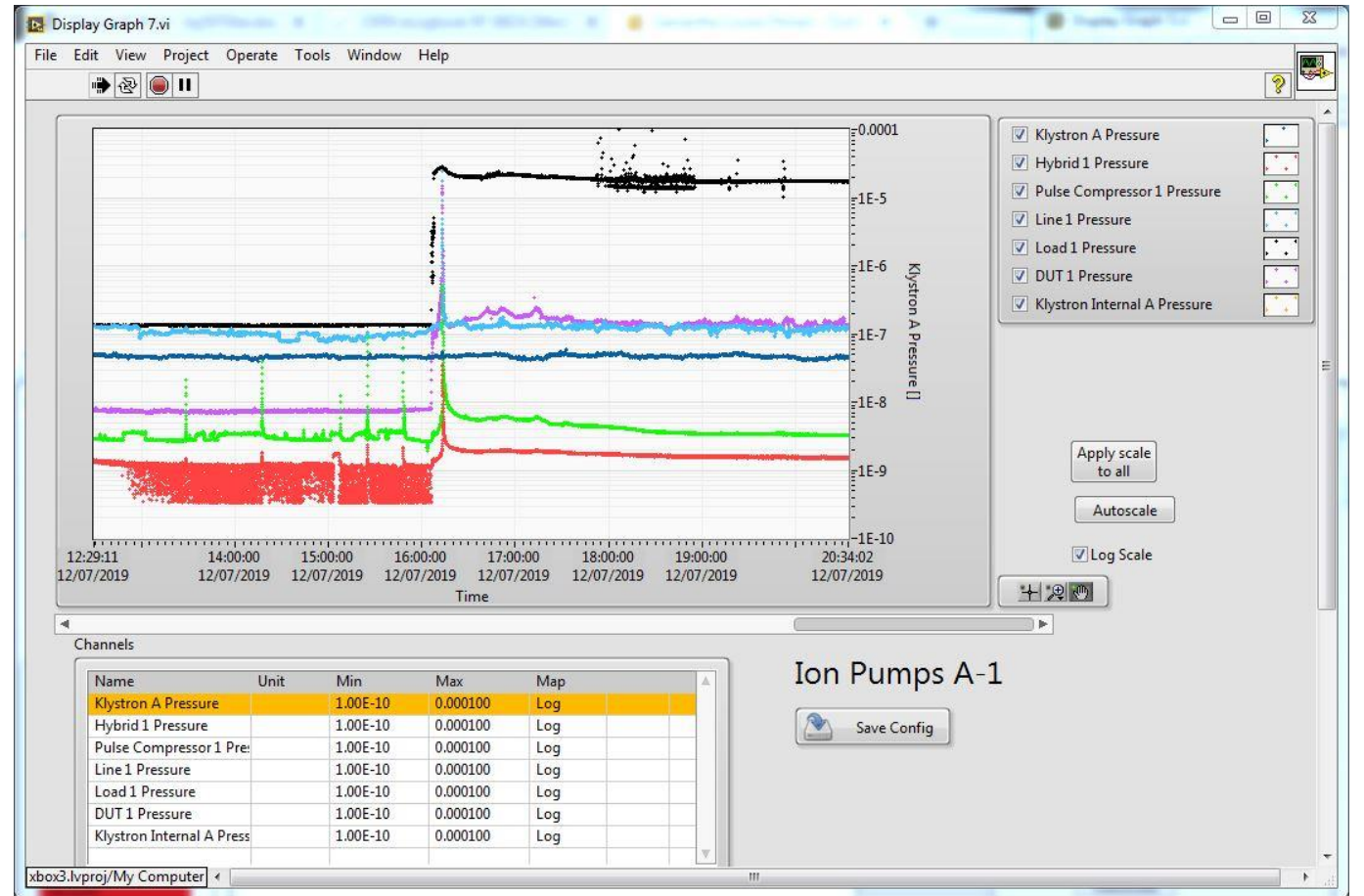
# XBOX3 Line 4 – TD24\_UBO

- 1 Week History in pulses
- Ramped to 35MW
- Flat running
- Breakdowns still in the structure not the pulse compressor



# Vacuum

- Vacuum leak in load 3 varnished.
- Varnish is designed for application under vacuum.
- Looks like varnish contaminated line.
- Flashed and re-activated negs.



- Vacuum spike appears in C+D
- Gauges and Ion pumps
- Mod interlock at the same time  
–FiberIntSts\input missing

192.168.1.151 - Remote Desktop Connection

11/07/2019 11:01:46  
AccessLevel: Operator

**ScandiNova**  
XBOX 3D

CVD: 0.0 kV  
CT: 0.0 A

F1: Toggle help

Type	Timestamp	TrigId	Text
State	11/07/2019 10:18:33:905	0	StandByOnRequested

Type	Timestamp	TrigId	Text
Message	10/07/2019 12:36:03	20	0 AccessLevel: ScandiNova
Param	10/07/2019 12:35:09	881	0 Ccps\VoltSet\Invalid Set
Param	10/07/2019 12:31:55	165	0 Kly\EpsCurrSet1\Set1: 10.3 A
Param	10/07/2019 12:31:48	903	0 Ccps\VoltSet\Set: 960 V
Param	10/07/2019 12:26:20	491	0 Kly\EpsCurrSet1\Set1: 10.4 A
State	09/07/2019 18:13:03	620	0 Trig
State	09/07/2019 18:13:03	590	0 TrigOnRequested
State	09/07/2019 18:13:03	580	0 Hv
State	09/07/2019 18:12:58	580	0 HvOnRequested
State	09/07/2019 17:58:23	880	0 StandBy
State	09/07/2019 17:58:23	870	0 HvOnRequested
State	08/07/2019 22:30:38	170	0 StandBy
Interlock	08/07/2019 22:30:38	162	0 Trg\FiberIntSts\input missing
Interlock	08/07/2019 22:30:38	162	0 Trg\HvCrntExtIntlkSts\input missing
State	08/07/2019 17:04:13	970	0 Trig
State	08/07/2019 17:04:13	940	0 TrigOnRequested
State	08/07/2019 17:04:13	930	0 Hv
State	08/07/2019 17:04:08	930	0 HvOnRequested
State	08/07/2019 16:54:11	150	0 StandBy

Type filter: All

Time filter start: 01 January 2000

Time filter end: 31 December 2499

Trig filter start: 0

Trig filter end: 268435455

Text filter:

Warning configuration: Decay 3 sec, Logging

RESET

CommSts

LOC REM

TRIG

HV

STANDBY

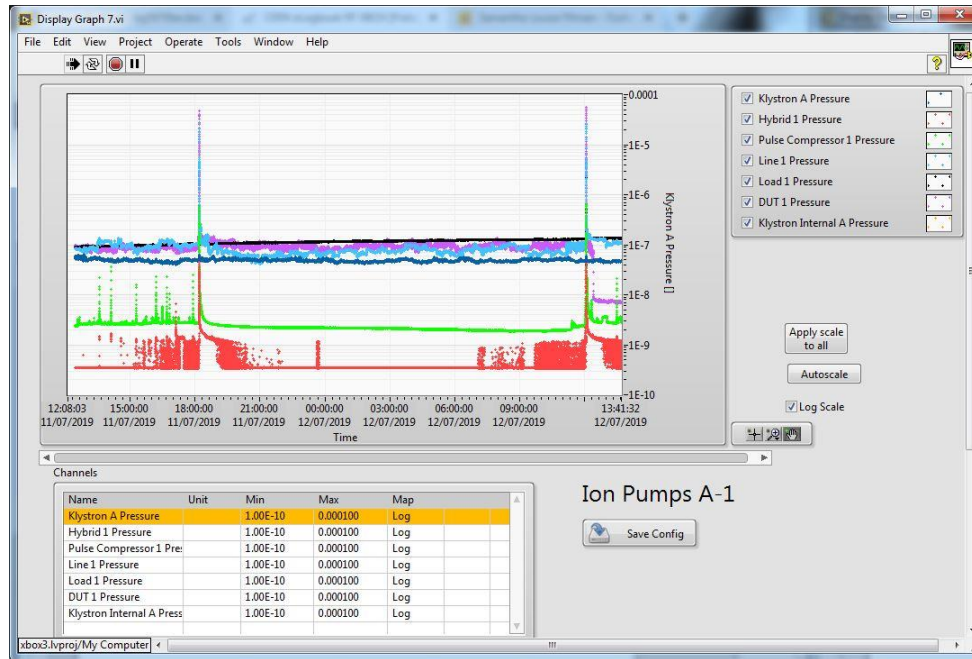
OFF





# Vacuum Spike 3

- Vacuum spike appears in C+D
- Gauges and Ion pumps
- Mod interlock at the same time –FiberIntSts\input missing



192.168.1.151 - Remote Desktop Connection

12/07/2019 13:10:51  
AccessLevel: Operator

**ScandiNova**  
XBOX 3D

CVD: 159.5 kV  
CT: 91.9 A

F1: Toggle help

**Warning** 12/07/2019 11:29:38:277 0 Tank\DigiSumSts\Input missing: 1111 1111 1111 0111

Type	Timestamp	TrigId	Text
State	12/07/2019 11:29:38:305	0	Trig
State	12/07/2019 11:29:38:275	0	TrigOnRequested
State	12/07/2019 11:29:38:265	0	Hv
State	12/07/2019 11:29:33:265	0	HvOnRequested
State	12/07/2019 11:17:20:425	0	StandBy
Interlock	12/07/2019 11:17:20:418	0	Tai\HwCtrlEntIntikSts\Input missing
Interlock	12/07/2019 11:17:20:418	0	Tai\FiberIntSts\Input missing
Interlock	12/07/2019 11:17:20:418	0	Tank\DigiFwhRead\Hlim exceeded: 17.64 us
State	12/07/2019 10:34:59:845	0	Trig
State	12/07/2019 10:34:59:815	0	TrigOnRequested
State	12/07/2019 10:34:59:805	0	Hv
State	12/07/2019 10:34:54:805	0	HvOnRequested
State	11/07/2019 17:24:06:655	0	StandBy
Interlock	11/07/2019 17:24:06:649	0	Tai\FiberIntSts\Input missing
Interlock	11/07/2019 17:24:06:648	0	Tai\HwCtrlEntIntikSts\Input missing
State	11/07/2019 11:32:04:365	0	Trig
State	11/07/2019 11:32:04:335	0	TrigOnRequested
State	11/07/2019 11:03:57:425	0	Hv
State	11/07/2019 11:03:52:425	0	HvOnRequested

Type filter: All  
Time filter start: 01 January 2000  
Time filter end: 31 December 2499  
Trig filter start: 0  
Trig filter end: 268435455

Warning configuration  
Decay: 3 sec  
Logging:

RESET  
CommSts: 1 0  
LOC  
REM  
TRIG  
HV  
STANDBY  
OFF