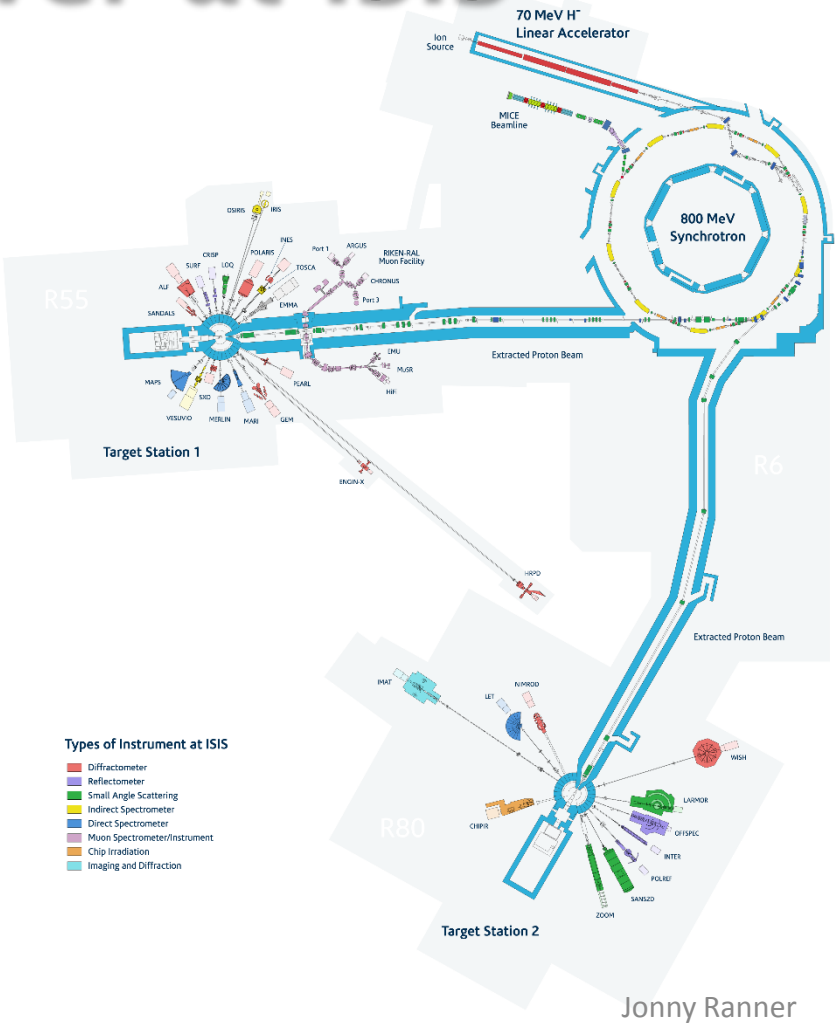
Science & Technology Facilities Council

Pulsed Power at ISIS

- ISIS Neutron and Muon source
- H- linac
- Proton synchrotron accelerator
- 800 MeV, 50 Hz, 240 µA/day
- Shutdown ~120 days per year

- ~130 accelerator staff
- 4 pulsed power staff

Jonny – Magnet Power Supplies Group leader and Head of PP R&D
Michael – PP Operations Section leader
Jaysen – PP ops technician
Ben – Part time PP ops technician



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Pulsed Power at ISIS

System	Kicker	Particle	Switch technology	Peak Ratings	Rise time	Pulse width
MEBT Chopper	Stripline	H- ions	(in design)	15 kV	5 ns	100 ns
HEDS Chopper	Electrostatic	H- ions	Thyratron	30 kV	20 ns	~5 ms
Injection Dipole	Magnetic	H- ions	Thyristor, IGBT	15 kA 2 kV	100 µs	550 µs
TS-1 Kicker (6 off)	Magnetic	Protons	Thyratron	5 kA 40 kV	100 ns	1 µs
TS-2 Slow Kicker (2 off)	Magnetic	Protons	IGBT	2.8 kA 1.4 kV	12 ms	600 µs
RIKEN Muon Kicker (4 off)	Magnetic	Muons	Thyratron	5 kA 30 kV	100 ns	1 µs
EC Muon Kicker	Electrostatic	Muons	Thyratron	35 kV	20 ns	~10 µs
µSR Muon Chopper	Electrostatic	Muons	(in design)	60 kV	10 ns	100 ns

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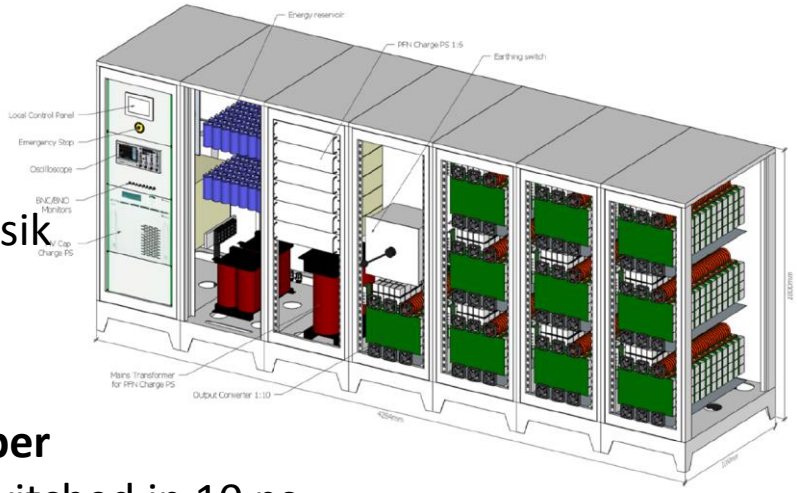
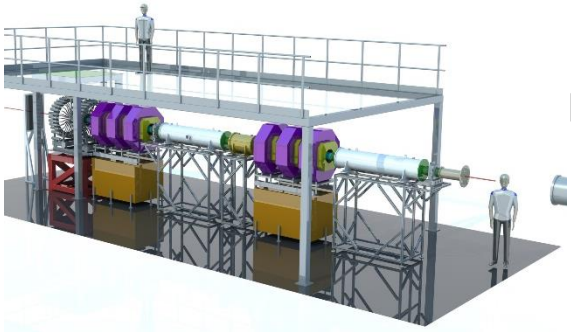
Pulsed Power at ISIS

Some of our more interesting projects:



Replacement of Injection dipole PSU

- 15 kA, 550 µs pulse
- Designed and manufactured by Danfysik
- Delivery January 2019



New Muon chopper

- ±60 kV, switched in 10 ns
- Currently looking into feasibility

Diamond switch

- Possible thyratron replacement technology
- Proof-of-principal ready at end of March 2018 (in a few weeks)