Neutron Electronics

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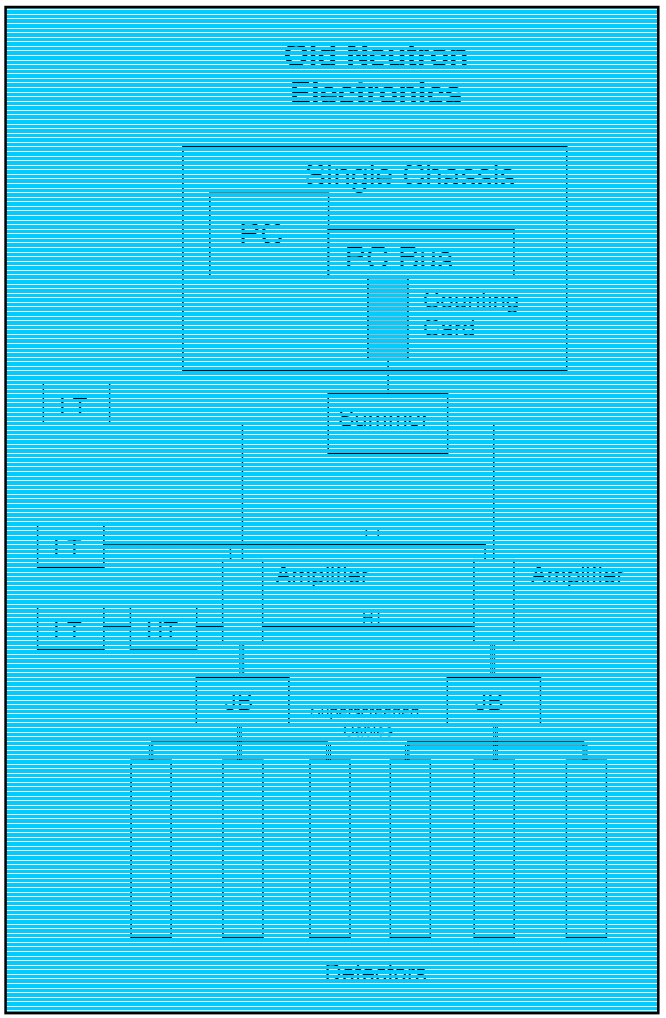
Introduction

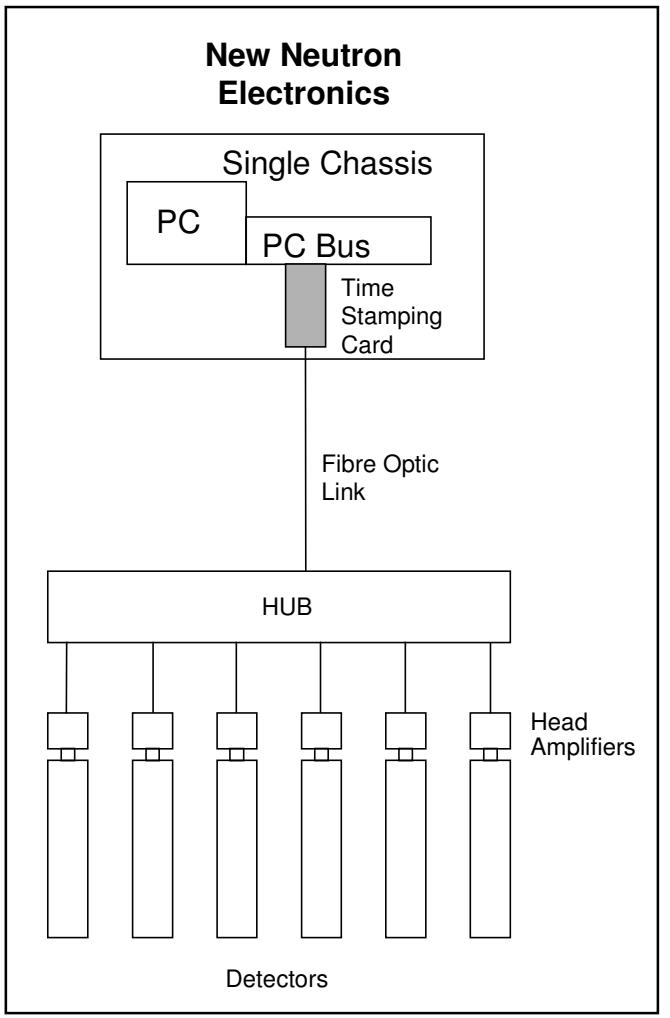
- BIL Solutions Ltd. – formally BNFL Instruments
- Specialist business within the BNFL Group that is focused on the design and application of detection, monitoring and measurement instrumentation and services to support nuclear, defence, civil, environmental and industrial sectors.
- Use of neutron electronics is fundamental to our business - extensive research and development taken place in this area.

Neutron Counting Electronics

- Neutron counting electronics patent granted in Europe, China and USA
- Covers neutron detection signal handling and processing technology based upon the “timestamping” of pulses
- Neutron technology deployed in the latest neutron assay instruments
- Suitable for replacing obsolete electronics on existing systems

Old → New


Old Neutron Electronics
Single Chassis
PC
PC Bus
Counting Card
HT
Summer
HT
Amplifier
Amplifier
HT
HT
HV
HV
Detectors


New Neutron Electronics
Single Chassis
PC
PC Bus
Time Stamping Card
Fibre Optic Link
HUB
Head Amplifiers
Detectors

Amplifiers

- Amplifiers and connectors filled with electrical potting compound
- No operator access of user adjustable parts

HUB

- Primary function to assign digital word indicating channel legitimate neutron event detected by head amplifier
- Two secondary functions:-
  - to derive from mains all HT and LT power supplies used internally and by amplifier
  - to provide system and maintenance engineer with appropriate health and status information
- Fibre optic connectors provide communication link from HUB modules to timestamp PC

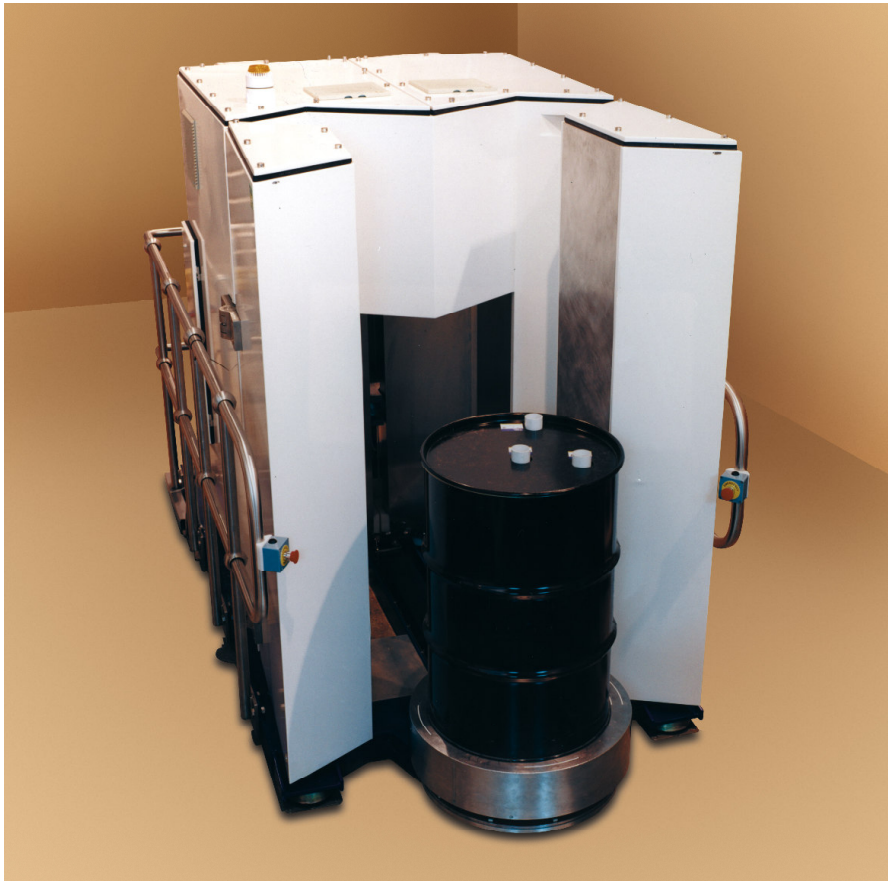
Timestamper

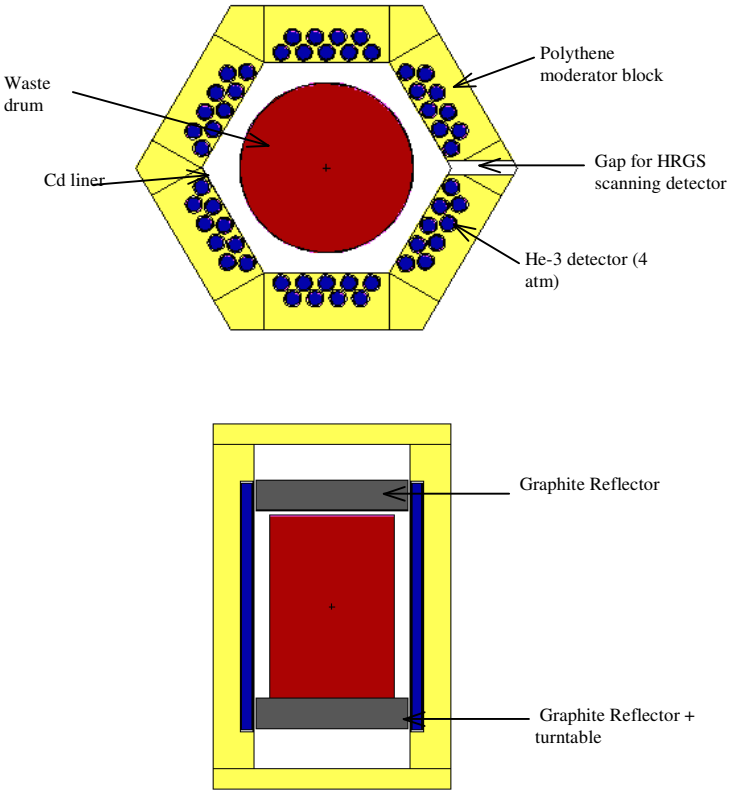
- Incoming neutron timestamped pulse train generated by the timestamper unit from the neutron counting chain
- Each neutron will have an associated time of arrival and channel (location)
- Timestamped neutron events analysed using software

Summary of Features

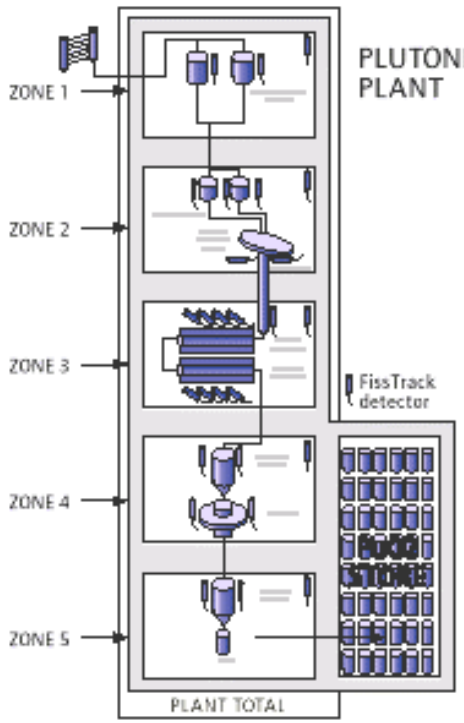
- Simplified installation
- Detector address provided
- Very good EMC performance
- Modular design with only three components; Amplifier, Hub and Timestamper
- Highly robust amplifiers
- Remote diagnostic and status

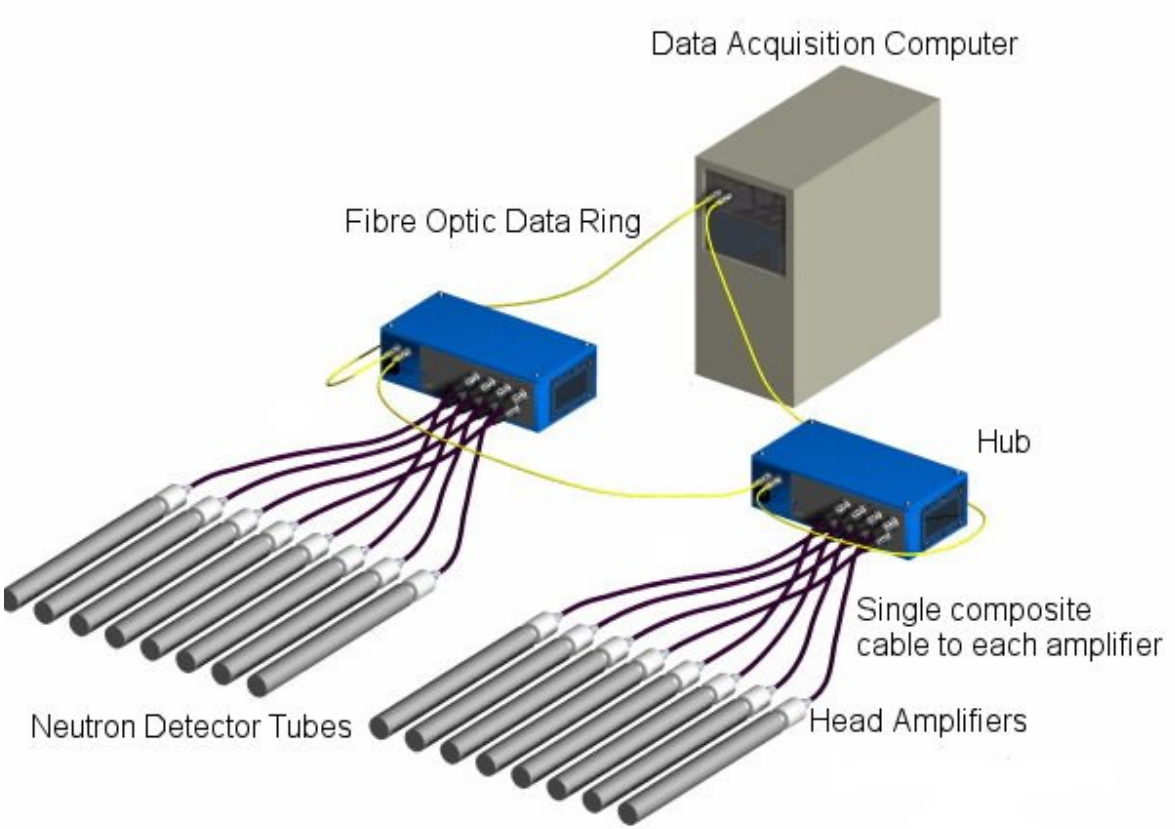
TRU-D® DRUM High Performance Pu Drum Monitor





FissTrack® PIMS (Plutonium Inventory Measurement System)





DISPIM® Modular Mobile Pu Monitor