VIDARR

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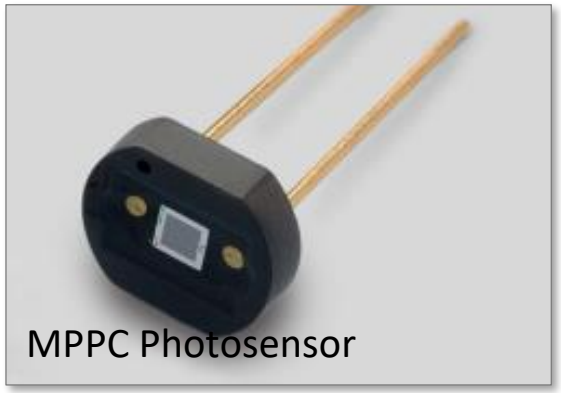
JCS

The VIDARR detector

- Active scintillator bars read out with WLS + MPPCs
- Using self-contained mobile laboratory
  (20 ft. ISO container)
- Transport using standard HIAB truck
- Field tested at Wylfa
- Reactor Modelling via
  National Nuclear Lab (NNL) UK


Extruded Scintillator


Wavelength Shifting Fibres


MPPC Photosensor

ICURe Outcomes

- What is ICURe?
- Short programme to evaluate the commercial potential of research:
  - UK-based
  - 3 months length
  - Provided training
  - Travel funds
  - Aim: contact 100 industry contacts to survey idea

Key Learnings

- Nuclear industry is conservative, meaning:
  - Slow uptake of new technologies for R&D's sake
  - Requires mature, well-developed and tested technology: COTS solutions vastly preferred
  - Utility companies: no **fast growth**, most economic projections are **long term** (low risk tolerance)
- Potential uses of anti-neutrino technology:
  - **Reactor optimisation**, via reduced uncertainties
  - **Criticality monitoring** for nuclear facilities
  - **Safeguards**, esp. for Gen V/bulk fuel (e.g. pellets, molten salt) and SMR technologies
  - **Waste Assay**, at the moment interest is in feasibility
- All applications require a ***solution*** first: nobody wants to fund R&D highlighting a ***problem with their business***
- Monitoring & safeguards will require ***regulatory pressure*** to adapt technologies beyond currently available (no economic incentives otherwise)

Requirements for deployment

From experience of talk to ‘UK-support programme to IAEA’ and current industry discussions

- Safeguards and verification of Reactor operations remains attractive when discussing with operators
- Applications research tend to want an infield tested device before doing R&D to test capabilities
- Roadmap provided in
  - IAEA report 2008*
- Provides a route to safety cases and access
  - allowed access to Wylfa Magnox
- focus on making it a "drop-in" device that does not require a (particle) physicist to operate it day-to-day

Requirement
Inert construction
Non-liquid
Easy operation
Cheap
Portable
Robust
Aboveground operation
Easy deployment

*“Final Report: Focused Workshop on Antineutrino Detection for Safeguards Applications”, IAEA (2008)