Evolution of an Industry Advisory Board

School of Mathematics and Physics

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A Little Background

• Portsmouth had Physics degree and masters courses until its demise in 2001
• Industry formed a very close link with the masters course
• Physics reformed in 2010 with input from industry partners
• Joined SEPnet in 2010
• Started Industry Advisory Board 2012
Reviews

- Wakeham Review, 2016 (STEM Degree provision and Graduate Employability)
- Shadbolt Review, 2016 (Computer Science Degree Accreditation and Graduate Employability)

Alongside more detailed recommendations, both reviews identified that:

- **students would benefit from universities and employers working together** to expand and improve the array of work experience opportunities and embedding the learning from work experience more consistently in degrees

- **professional bodies need to strengthen their accreditation systems so they support universities to deliver high-level STEM skills that are most relevant to industry**
Learning Links

Academia

SEPnet

Professional Bodies

Student

Academic Learning Skills Learning

Placements Mentoring Transferrable Skills

Continual Professional Development

Industry
Forming an Industrial Advisory Board (IAB)

- Start with contacts you know, build up a small group
- Local employers and appoint Chair from industry
- One productive working meeting per year with clear activities and outcomes.
- Ensure benefits exist for employers:
  - Provide resources, academic specialists, student workers
  - Promote your company
  - Provide a recruitment opportunity
  - Improve Corporate Responsibility on both sides
IAB Aims

• What do you want to achieve?
  • Clear benefits for all parties
  • Leadership/vision/critical friends
  • Industry needs for CPD
  • Identification of funding streams
  • Joint projects
  • Keeping things on track
  • Helping to devise and implement strategy
Current IAB Invitees

Name
Selex Galileo
Dstl Acoustics
BAE Systems
Airbus Defence and Space
SEPnet
Defence Academy
National Instruments
NPL
Dstl Alverstoke underwater
Dstl
Ports Hospitals NHS Trust
QTEC
IBM
Fry IT
STFC
Astrium
IRed Ltd
Nabla ventures
DSTL Environment Science
STS Defence

Kurt J Lesker
Grass Valley
IOP – Business Engagement

Head of School
Student Placement and Employability Centre
Institute of Cosmology and Gravitation academics
Physics academics

Student reps
The IAB

- Needs to understand:
  - The current demands of employment (as encountered by physics graduates)
  - The value of physics knowledge in adding value in employment
  - The nature and value of employability skills in adding value in employment
  - The value of “employability” from employers’ perspective
  - Embrace the need to provide suitable learning opportunities within the physics curriculum
Student skills

• 2011 The IOP publication The physics degree – graduate skills base and the core of Physics
  https://www.iop.org/education/higher_education/accreditation/file_43311.pdf

• 2017 Physics today - Preparing physics students for 21st century careers

• 2019 Graduate prospects – What can I do with my physics degree?
  https://www.prospects.ac.uk/careers-advice/what-can-i-do-with-my-degree/physics

Make sure all attendees requirements are registered in the meeting minutes
Engaging Employers with Curriculum Design and Delivery – What we do

Involvement in curriculum delivery in credit-rated units at each level;

Applications and Impacts of Physics (20 credits L4)
Industry-lead Problem Based Learning in the labs at L5 Group and Individual Industry Projects at L6 (40 credits BSc)
80 credit projects at MPhys (L7)

RF and Microwave Systems (L6)– industry specialists
Health Physics (L6) – medical physicists
Example: Applications and Impacts of Physics L4 (20 credits)

- Introduction to the application of physics in industry and employment
- Industry and Health Professionals deliver lectures/Students engage in site visits
- Begin to develop independent research skills and communication skills
- Assessment: case study, presentation and popular article.
Industry Placements

• Year-in-Industry
  Most problematic element – range of reasons.
  Competitive nature of large company Year-in-Industry schemes.
  Relatively low budget operations of most SME’s – timing issues.
  2017 – 1 students placed
  2018 – 2 student placed
  2019 – 2 students placed

• SEPnet placements
  8 weeks summer placements can form basis for final year project.
  2017 – 2 students placed
  2018 - 1 student placed
  2019 - 8 students placed
Industry Placements (Continued)

• Other Options

  4 on (non-SEPnet) summer placements

  1 on Teacher training summer scheme
Industry Projects

Final year (40 credit BSc, 80 credit MPhys) joint university-industry projects integrating experimental, theoretical and computational skills and knowledge to design, plan, implement and evaluate a project that addresses specific problems that arise in the industrial, research and field context.
Positive Outcomes

The reduction of dose in paediatric panoramic radiography: the impact of collimator height and programme selection

A T Davis, H Safi, and S M Maddison

Abstract
Remediation of Radon Gas
Matthew Russell
Supervisor – Alex Nicholson (DSTL)
University Supervisor – Dr. Christopher Dewdney

Abstract: The most significant component of radiation exposure to the public is the inhalation of radon progeny [1]. Organisations such as DSTL must adhere to Ionising Radiations Regulations that require implementation of radon remediation strategies to restrict radon gas concentration exposure exceeding 400 Bq m⁻³ in the workplace [2]. To overcome the costly nature of current engineered remediation techniques, results suggest implementing an ion generation technique would reduce the aerosol concentration of radon [3].

INTRODUCTION

Radon (Rn) is a colourless, odourless, and radioactive gas that results from the primordial radionuclide ²³²Th. It forms the majority of natural radioactive material within indoor environments [4]. Increased radon levels within indoor environments increase the risk of lung cancer [5]. To mitigate this risk, and in doing so conform to radiation regulation legislation, ion generation and increased convection techniques improve current radon remediation techniques. This study reports on the results of the measurement of the effects of ion generation on radon concentration levels in an indoor environment.

METHODOLOGY

The VI-2500 (Figure 2) releases negatively charged particles into the indoor environment, resulting in the positive radon progeny becoming negatively charged through diffusion charging. This negative radon progeny is attracted to positive room boundaries at an increased rate and thus removed from the respirable air through electrostatic forces.

The VI-2500 releases 450 trillion ions per second into the surrounding space [6] and potential alpha energy concentrations (PAECs) were recorded using a Radon Working Level Meter, enabling alpha counts to be recorded as a function of time. Experiments in closed room conditions with and without ion generation proceeded further experimentation with increased convection.

Total alpha counts recorded within a set time period allowed a location’s conformity to legislation that limits radon gas concentration exposure to 400 Bq m⁻³ to be checked. Calculations to gain this assurance utilise the following calculation whilst knowing that 1 Bq m⁻³ ≈ 2.7 x 10⁻¹⁰ WL [6].

RESULTS

Figure 3 shows operating the Ion Generation Device reduces PAEC compared to background PAEC with a total reduction of 85.2% ± 3.6% within the MBG35 location. PAEC is reduced further with additional increased convection with a PAEC reduction of 89.4% ± 2.8% - Figure 4 illustrates PAEC reduction across different locations with an 89.7% ± 0.41% reduction in the RAF Waddington ND Cellar demonstrating the ion generation technique’s success in removing radon from the respirable air within locations with high background PAEC’s.

CONCLUSION

Negative ion generation is an effective radon remediation technique within indoor environments with an ability to remove airborne radon decay products regardless of their source. PAEC reductions of up to 90.9% ± 1.6% (Minor Source Store) for indoor environments and low background radon gas concentrations (MBG35, 6.03 Bq m⁻³ ± 0.48 Bq m⁻³) and 89.7% ± 0.41% for large background concentrations (RAF Waddington, 278.5 Bq m⁻³ ± 3.34 Bq m⁻³) justify its use as a reliable radon remediation technique.
Summary

key issues in starting, using and maintaining an IAB

- What do universities want to get out of it?
- What are you expecting from members?
- What will the industrial members get out of it?
- Who are your key industries?
- What other networking opportunities do you have (for staff and students)?
- How will you maintain impetus, monitor and measure success?

Act on the information you get, otherwise it is a tick box exercise of little value
Thank you for listening