

Minutes of the Aerospace Industrial Advisory Board (AIAB) Meeting

Location: Library Seminar Room

Time: 2-5.30 PM

Present: EXTERNAL BOARD MEMBERS: Dr Lucy Agyepong, MTC, Coventry; Mr Paolo Bianco, Airbus Defence and Space; Dr Christine Hannon, Rolls-Royce; Ms Christine Hobday, L-3 Communications, Dr Nisar Mirza, BAE Systems (To represent Mr Nick Martin); Mr Martin Muir, Airbus Innovations; Mr George Seyfang, BAE Systems (ret.); Dr Shahrokh Shahpar, Rolls-Royce; Mr Ian South, BAE Systems.

QMUL SEMS STAFF: Prof. Vassili Toropov (convener), Dr Jens D. Mueller, Dr E. Avital, Dr Ranjan Vepa, Dr Tom Verstraete (Visiting Faculty from VKI), Dr Fariborz Motallebi, Prof John P. W. Stark

Student members of the QMUL Fourth Year Project Group on Multidisciplinary Optimisation of an All-Electric Aircraft: Rayane Ait Oubahou, Andrew Amoateng-Agyemang, Omar Omar Ali, Emmanuel Onyenanu, Bilaal Siddiq, Sujeeran Thangarajah

Minutes recorded by: Dr Ranjan Vepa

Date: 29th October, 2015

MINUTES of the Meeting

1. The proceedings were conducted on behalf of the AIAB by Prof. Vassili Toropov (VT)
A. Prof. VT traced the history of QMUL's aerospace engineering programmes since 1906, when Prof A P. Thurston established the first aeronautical engineering programme at Queen Mary College (which was then known as the East London College.) VT mentioned that AP Thurston, Dr N. A. V. Tonnstein (Piercy), Dr L. G. Whitehead and Prof A. D. Young were the early pioneers of the aeronautical engineering programmes at Queen Mary College.
2. VT introduced the AGENDA for the AIAB meeting. He then requested all of the external members to introduce themselves, which was then done by all. School of Engineering and Material Science (SEMS) staff responsible for delivering the aerospace engineering programmes then introduced themselves. A few representative fourth year students attending the meeting also introduced themselves.
3. The next item on the agenda was the appointment of a Chair. No nominations for the Chair were made at that time.
4. VT then explained the internal membership of AIAB and its role. VT also spelled out briefly the benefits of holding the AIAB meetings both to the school as well as to the external members. VT underscored the importance of securing industrial support for the research and teaching activities at SEMS amongst the group of staff delivering the aerospace programme. VT briefly summarised QMUL's standing both within the UK and internationally. Following that VT briefly introduced the School of Engineering and Material Science (SEMS). He mentioned that the school was ranked 7th out of total of 62 and 4th based on research output. He also pointed out that there are currently 50 FTE academic staff, 1300 students (1020 undergraduates, 60 taught post-graduate & 220 PhD students) and 60 research assistants. VT also outlined the short term and long term

plans for student recruitment. Prof VT also briefly mentioned key teaching highlights and the National Student Survey (NSS) results.

5. Prof VT mentioned the school was considering to establish collaborative teaching programmes with one of 3 universities in China.

Mr Martin Muir (MM), Prof. Shahrokh Shahpar, (SS) and Mr. Ian South (IS) point out that they have very stringent confidentiality restriction as they do US defence work. This may limit collaborations if QMUL opens research access to Chinese partners.

6. Members also recommended that representatives of some other major aerospace companies such as GKN, GE Aviation, QinetiQ and others could also be invited to join the board. VT highlights the absence of rotorcraft partners in the mix. SS suggested to all members of the IAB to pass on to VT any contacts they have in these companies, or other areas of activity that should be represented on the IAB.

7. Prof VT outlined the avenues for industrial partners to being involved in BEng, MSc, MEng, and other projects such as sponsored research and part funded PhD projects. Members were briefed on how funding is provided annually for partially funded PhD projects by Dr J. D. Mueller via EPSRC/QMUL/CASE/CSC routes. Members were informed that fully funded PhD projects involved full economic costing (~£110000 for 42 months and ~£60000 for 42 months for partially funded PhD projects). There were also possibilities of embedded collaborative research projects being undertaken where the employees of an industrial partner company could work on a research project within the SEMS environment. There is also the possibility providing funding to QM(SEMS) researchers to conduct industrially sponsored research.

Some members expressed an interest in extending such support and asked for published deadlines for these projects. QMUL will publish a timeline of these calls, as well as the dates for ILF and career fairs. Dr. Nisar Mirza (NM) also asked to receive a copy of the standard QMUL IPR agreement. JDM pointed out that QMUL is flexible on this, and can also work with the sponsor's IPR template.

8. Dr Fariborz Motallebi (FM) explained that aerospace students of the School were offered placements at several industries in the UK over one or more semesters.

Dr Lucy Agyepong (LP) suggested that all IAB members circulate vacancies for internships to QMUL.

9. There was considerable discussion on the issue of teaching transferable and computer skills (including manufacturing technologies) essential to the aerospace industry. SS, IS, Mr. Paolo Bianco (PB) all thought that students did not have enough programming skills and knowledge of operating systems (beyond the Windows desktop). While the range of relevant languages and OS's can't be covered in the curriculum, students should have seen the concepts. NM points out that during placements students can then build on this basis.

12. VT introduced the aerospace taught programmes at the BEng and MEng levels and the modules covered in them, highlighting the manufacturing and design-oriented modules in the programmes.

LA and Christine Hannon thought that there was not enough manufacturing. This could be achieved by a combination of teaching principles, design and manufacturing and production. MM however pointed out that very few other Universities do this, probably as time is limited in the first year. This could be an opportunity for QM, as there clearly is demand for trained graduates in this area.

There was some discussion amongst all of the members about the make-up of the programmes and the external members, in particular, PB expressed the need for a module on *systems engineering*.

13. Dr. Eldad Avital introduced the aerospace taught programmes at the MSc level.

14. Student members of the QMUL Fourth Year Project Group on Multidisciplinary Optimisation of an All-Electric Aircraft gave a brief presentation of their project. Panel members discussed the project with the students and supervising staff to get an idea of the project brief of a typical MEng project, as well as particular details of this project. VT suggested to make a student project presentation a standing item on the agenda of the IAB.

15. Prof VT introduced draft syllabi for new MSc programmes that SEMS is considering to introduce in the area of aerospace engineering: a) MSc in Aerospace Structures and Materials; b) MSc in UAV Systems; c) MSc in Aerospace Systems. The board seemed to generally support the re-introduction of the last programme (c).

The MSc Aero Structures proposal was not considered a hugely interesting proposal. IS, PB and LA suggested it could be made more relevant by introducing manufacturing to this curriculum, which is a significant industrial issue at the moment with a move in industry to machining, away from casting/forging due to the lack of a supply chain in that area. NM stated that there is a need for structural engineers, as e.g. Airbus is increasingly taking this work back in house to maintain a skills base, rather than subcontracting it. But it is not an attractive area of work, it may be difficult to recruit students. C Hannon particularly liked the proposed module on experimental methods.

The MSc on UAVs was considered by PB to be aiming at a new product, and possibly attractive to student intake, but it did not require any new skills to be taught. It was not clear where the specialty was. The inclusion of EECS for truly autonomous control might help to distinguish the program and make it unique. MM suggested to look at a recently published Jane's article on the subject, outlining future sales potential. PB suggested to broaden the scope and call it 'future aircraft'. IS suggested that this MSc would be more relevant to BAe than the MSc Aero Structures. MM observed that both these first MScs were closely related, a good addition to the curriculum could be rapid prototyping with metals or airworthiness certification.

The MSc Aero systems was received much more favourably than the two other proposals. IS stated the massive shortage of skills in this area, the most important skill was on 'New Airframe Systems'. SS raised concerns about viability: while covering interesting areas he was not sure what skills in the MSc could be covered by existing staff. JDM suggested that SEMS circulate a summary of staff research and teaching profiles to the IAB for comment. VT stated that for this MSc a collaboration with a/c operators was essential, a link we don't yet have. Christine Hannon (CHan) said she could broker contacts. IS offered contacts to Eaton, Martin Baker (Escape Systems), Dowty Air Systems. MM also offered contacts to Dowty. FM asked members about company interest in taking some of these modules as internal company training, IS signalled interest for BAe for this MSc.

16. Proposed date of next meeting: 4th March, 2016 (To be confirmed) The IAB discussed the frequency of meetings. To add time for discussions, a meeting additional to the one of March 4 at the next ILF was agreed. A suitable time for all members seemed to be a date in June.

R.Vepa, 29th October 2015.

J-D Mueller 9/11/15.