

Cambridge - Cranfield - ARCI - Monitor EPSRC Grant Meeting Minutes

Gordon Laboratory Seminar Room
Department of Materials Science and Metallurgy
New Museums Site, Pembroke Street
Cambridge CB2 3QZ

<http://www.msm.cam.ac.uk/department/find.php>

Tuesday 9th April 2013 9.00am – 14.00pm

Present

Bill Clyne <twc10@cam.ac.uk>	TWC	Cambridge
Sai Gu <s.gu@cranfield.ac.uk>	SG	Cranfield
Simone Stuart-Cole <simone@monitorcoatings.com>	SS	Monitor Coatings
Maya Shinozaki <ms660@cam.ac.uk>	MS	Cambridge
Alex Greatholder <ajg88@cam.ac.uk>	AJG	Cambridge

Circulated for Information

Shrikant Joshi <svjoshi@arci.res.in>	SJ	ARCI
Sivakumar Govindarajan <gsiva.arci@gmail.com>	SG*	ARCI
Bryan Allcock <bryanallcock@monitorcoatings.co.uk>	BA	Monitor Coatings
Kevin Roberts <kar1002@cam.ac.uk>	KAR	Cambridge

Minutes

- 1.1 TWC opened the meeting.
- 1.2 Tour of department facilities was conducted. Facilities seen included the plasma-spray rig, jet engine, periodic quenching furnace (for spallation testing), high temperature creep rig, hot corrosion rig, PEO rig and the nano-indenter.
- 1.3 Have all three research institutions involved formally accepted the grant offer?
 - It was ascertained that only Cambridge (as the institution with the PI) had been sent the official offer letter, and TWC confirmed that this has indeed been formally accepted by the University. It is agreed that January 2014 will be the official start date.
- 1.4 What are the immediate action plans for Cambridge, Cranfield and ARCI till the official start date of Jan 2014?
 - TWC: At Cambridge we will have MS (who submitted her PhD last month her viva is confirmed to take place on 6th June 2013) and AJG (who started his PhD in Oct 2012) working on this project.
 - SG: At Cranfield we will have one PhD student, who started two weeks ago, having just arrived from Pakistan. The focus of her project will be on the CFD modelling of the thermal spray gas flow (her background is mainly in fluid dynamics). There is also another PhD student, who has just arrived from Greece (?) and his work will focus on the modelling of particle impact. Such modelling could also be extended to looking at erosive effects, as well as deposition. Both studentships are fully funded, partially by their respective governments. SG also has two post docs working on a SuperGen project and another on an EPSRC program concerning carbon capture, all of whom are specializing in

modelling. Another EPSRC program which SG holds is coming to an end, but some of the money left over from this can be recycled to be used on students in this program, and some of the current projects running also have some flexibility. Thus the team at Cranfield is therefore ready to commit to this immediately.

Action: *SG to provide names of his two PhD students, and any other personnel who may be directly related to the project.*

- SJ: Whilst it is not possible to employ any post docs, there are plenty of PhD students who may be brought into this program. SG* is due to hand in his PhD by the 30th June 2013, and thereafter would like to focus on some modelling work, possibly of the SPPS process. SG* would also like to look at spraying different chemistries (particularly of Gd pychlores), where the composition is formulated in situ. The SPPS rig is fully functional, with the capability to produce hybrid coatings (by simultaneous feeding of both solution and powder), which may be layered or a composite. There has been no contact with the industrial partners in India.

1.5 What can we plan in terms of individuals visiting each of the three institutions?

- TWC: Students of SG and SJ are welcome to spend some time in Cambridge, possibly to collect experimental data that will compliment their modelling work. MS and possibly AJG may be interested in going to India to see the facilities at ARCI over the next few months. One of SG's Indian students may also be able to accompany this trip, which would be very helpful.
- SG: Similarly students of TWC and SJ are welcome to spend some time in Cranfield. Perhaps SG* will be interested in coming to conduct modelling of the SPPS process. DSTL funding is available for a period of ~ few months to send/ receive students. It is also possible to gain access to experimental facilities in the Materials Dept, e.g. EB-PVD, however, a charge would incur.
- SJ: Whilst sending students from ARCI may prove a little complicated at this stage, receiving visitors to do experimental/ modelling work will not be a problem. In the proposal however, there is a plan for SJ and SG* to spend 10-12 weeks a year in the UK. Good computing facilities for modelling (commercial software such as ANSYS) are available at ARCI.

1.6 Can we exchange any specimens?

- TWC: We would be interested to know whether it is possible to SPPS onto alumina substrates.

Action: *MS and AJG to organise alumina substrates (which are surface roughened in order to improve mechanical keying) to be sent to ARCI, to be SPPS-ed on.*

1.7 What updates do EPSRC require?

- TWC: EPSRC requires certain "outcomes" to be uploaded onto their website as a means of evaluating the progress of a project.
- SJ: ARCI is required to produce a yearly report.

Action: *All institutions should keep an eye out for potential joint papers arising (from exchanging of specimens/modelling/experimental data), which may then be uploaded as an "outcome".*

1.8 What are the main R&D interests for Monitor Coatings?

Action: *SS will investigate (a) specific research interests for Monitor and (b) any potential TSB bids that Monitor may want to lead.*

1.9 How will MS be funded till Jan 2014?

Action: *SS to report back on the status short term investment from Monitor Coatings in order to fund MS for the next six months. This may involve Siemens and they are interested in the modelling of hot gas flow. A meeting including BA should be scheduled in the next few weeks.*

1.10 Any possibilities for planning workshops?

- SG: Workshops are also considered to be a good “outcome”. Thus it would be a good idea to organise a workshop (perhaps in Cambridge?), early in the second year of the program. This should include major industrial firms and academics of the field. It would also be good to have as many Indian researchers there as possible to show good collaborative efforts. A venue (which has capacity of up to ~ 100 people) is available at Downing College in Cambridge.

Action: *A workshop should be held at some point in Cambridge. Provisional date for this would be March-April 2015.*

1.11 When will the next meeting take place?

- SG: There should be a meeting (either face to face or via video conference) where all partners have a chance to update each other every 3 months. The respective industrial partners should also be periodically updated.

Action: *The next quarterly meeting to provisionally take place during the week starting 8th July, possibly at Cranfield. Exact dates and details to be confirmed by email nearer the time.*

Action: *Quarterly updates/meeting minutes to also be circulated to each industrial partner. Each institution to be responsible for keeping industrial contacts well informed.*

- SG: It would also be a good idea to plan for a face to face meeting in order to kick off the project in Jan 2014. It may be most convenient if all partners meet in India, in order to avoid complications regarding visas etc.

Action: *Kick off meeting to be held in India, possibly during the week starting 6th Jan 2014. Exact dates and details to be confirmed by email nearer the time.*