

**Minutes of the “AutoMatIC” (Automotive Materials Intelligence Consortium)**

*PSA Peugeot Citroën, La Garenne-Colombes, France*

*23 October, 2014*

Attending:

David Helmer	GM
Denise Massa	GM
Vesna Savic	GM
Thorsten Michler	GM (Opel)
Klaus Raedcke	GM (Opel)
Manuelle Clavel	Granta Design
Dale Delgado	Granta Design
Romain Elleboode	Granta Design
Arthur Fairfull	Granta Design
Richard Painter	Granta Design
Clare Tomalin	Granta Design
Dan Williams	Granta Design
Rayad Benchiheub	Honeywell Turbo Technologies
Mark Blagdon	Jaguar Land Rover
Peter Seggewiß	KSPG Automotive
Benoit Changeux	PSA Peugeot Citroën
Yoël Mimouni	PSA Peugeot Citroën
Martine Monin	PSA Peugeot Citroën
Taha Niane Ngadia	PSA Peugeot Citroën

**Summary of Actions:**

<b>Minute</b>	<b>Action</b>	<b>Actioned</b>
1.2	Company overview presentations to be shared with the AutoMatIC members	GRANTA
3.2	Include agenda item at next meeting for members to present examples of how they manage disparate data sources	GRANTA
3.3	Granta to capture requirement/interest in a dynamic tree structure	GRANTA
4.6	JLR offered to provide an overview of JLR general welding schemas (for interim webex meeting)	JLR
4.9	Granta to instigate and co-ordinate a welding and joining schema project. Report on progress at the next meeting (April, 2015)	GRANTA LEAD; ALL to contribute
4.10	Granta to organize a group webex to provide an overview of the template schemas currently available	GRANTA
4.11	Granta to investigate the viability of a technical newsletter	GRANTA
5.4	Circulate a draft "State of Industry Matrix" before April meeting for member review	GRANTA
5.10	Add tribology schema to the agenda poll list for consideration in future meetings	GRANTA
6.2	Granta to capture requirement for Excel input forms to <i>drive</i> the values of discrete values in MI rather than being restricted by them	GRANTA
6.3	Members should arrange 1:1 sessions, as required, with Granta to discuss the new access control system offered with MI Version 8	ALL
6.5	Members to contact Granta support or services representative to discuss MI logging settings if required	ALL
7.8	At the next meeting, GM to provide an overview of their materials selection process	GM
7.15	Granta to report back at April meeting on Workflow roadmap at Granta	GRANTA
8.4	Granta to circulate dates for December 'recruitment' webinar	GRANTA
8.5	All members to investigate travel budget approval for the next meeting (week commencing ~20 April, 2015) in Detroit area (week of SAE World Congress). Confirm status by Interim meeting	ALL

## Minutes of the “AutoMatIC”, Thursday, 23<sup>rd</sup> October, 2014

### 1. Member Introductions

1.1 Richard Painter welcomed the AutoMatIC to their first meeting and thanked PSA for hosting it at their La Garenne facility. All of the representatives introduced themselves and described their current role to the group.

1.2 Richard provided an overview of Granta Design and why the AutoMatIC had been instigated. He then asked each organization to present their pre-prepared presentation which provided the group with an overview as to their organization’s motivations for joining the consortium. The group was reminded that all of the information shared in this and future meetings should be pre-competitive. It was requested by the meeting attendees that copies of the presentations be shared with the group. **(ACTION: GRANTA)**

### 2. Review Agenda Poll

2.1 Dan Williams provided an overview as to how the agenda poll had been used to drive not only the day’s events, but to capture the areas that the member companies were interested in. Based on Granta’s consortia experience, Dan went on to describe the proposed activity roadmap consisting of relevant “epics” and stories”. The draft AutoMatIC process and annual meeting timings were presented as a starting framework for the day and all agreed that this would be a useful process to follow going forward.

### 3. Technical Session #1: Consolidating and Standardizing Materials Data

3.1 Manuelle Clavel, facilitator for the “Consolidating and Standardizing Materials Data” session, began by presenting the results of the agenda poll. The two items receiving the most votes in this field were “consolidating disparate data sources” and “standard naming conventions for materials”. Representatives from each organization were asked to discuss why these areas were a priority.

3.2 Mark Blagdon highlighted that JLR have disparate data sources and are managing this through the use of a hub which “pulls” information from tables. Mark went on to request that it would be useful if different options of how to manage disparate data could be suggested by either Granta or other users. **(ACTION: GRANTA)**

3.3 With respect to naming materials, Mark informed the group that he had instigated the JLR naming convention and had opted for: a standard AA for aluminium, the ASTM name and also the chemical name if known. It would be useful if Granta could provide standard material names. In addition a dynamic tree structure would be very useful when reviewing the materials tree as materials lists could be lengthy. **(ACTION: GRANTA)**

3.4 Benoit Changeux agreed that they too had problems with the structure of materials data. Dan agreed that end users can either love or hate the tree structures.

3.5 From Rayad's perspective, at Honeywell Turbo Technologies, as they were just starting out they were very keen to understand the current best practice. Benoit highlighted that material naming could be difficult and they (PSA) were in the process of creating a unique dictionary for use by users from conception through to CAE and PLM. It was agreed by the group that often the same material could be called by many different names and functional groups often have differing interests in materials data. The group agreed that there needs to be intelligent naming and mapping of materials data.

3.6 From GM's perspective, Denise Massa highlighted that they have two different sources for materials data and it is the designer who assigns materials. When Mark asked whether GM have a preferred materials list, Denise told the group that they have a "Flat List" of 2800 materials. The vision for GM, described Denise, is to remove the free typing situation for materials assignment and anything outside of the approved list must be signed off. Arthur Fairfull highlighted that he was keen to receive guidance from the group as to the decision processes employed by users for material assignment in MI Gateway.

#### **4 Technical Session #2: Standard Schemas**

4.1 Following the networking break Clare Tomalin led Technical Session #2, "Standard Schemas", and provided an overview for the group as to the definition and scope of a schema within the context of GRANTA MI. Examples from the MDMC and Restricted Substances Database were used to illustrate that schema represent attributes and relationships, but *do not* include the materials data itself – so schema development could be pre-competitive.

4.2 Clare presented the results of the schema based discussion items from the agenda poll. The most highly rated discussion topic was found to be "standard schemas for welding/joining properties" (four votes), "composite material property simulation" received two votes and all other schema topics, (lightweight alloys, composites, trim materials, fabric materials, and lubricants) received one vote each.

4.3 The group were asked why they had voted in this way and was the welding/joining properties schema a high priority? Peter Seggewiß confirmed that no standard definition existed for welding and joining properties at KSPG and spot welding was of particular interest.

4.4. Mark described that JLR had initially looked at a schema for self-piercing rivets data but the project had since stopped. GM confirmed that they currently captured their data in Excel spreadsheets. In trying to avoid the issues associated with releasing competitive data, Mark informed the group that Arcelor provide free access to spot welding data which may be useful

4.5 Benoit agreed that they (PSA) were very interested in spot welding and the order of joining, which is important, needs to be captured and considered. Martine Monin added that tribological characterisation was also a key priority for them.

4.6 Mark agreed that spot welding (data) was important for JLR, to a lesser extent self-piercing rivets and not much continuous welding was done. Peter went on to include that friction welding was also of interest. Vesna Savic informed the group that they (GM) had a lot of joining projects underway

which had resulted in a lot of data needing to be captured. Vesna asked what the process would be for capturing the data and developing a schema. Dan suggested that if this was a priority project for the group, the starting point would be a data collection exercise of relevant sample (non-competitive) data and, from the data findings, a proposed structure could be presented to the consortium at the next meeting. To facilitate progress in this area, Mark offered to share with the group his schemas and how JLR are currently managing their data. **(ACTION: JLR)**

4.7 Mark went on to flag that composites are also increasingly an issue at JLR. Arthur noted that in PLM discussions with customers, the issues of liquids and lubricants data management are being raised. Martine agreed that lubricants were an important consideration for them in tribological applications e.g. engine oil. PSA currently have a materials database for coolants but also want to capture lubricants data.

4.8 Peter stated that coolant properties were required for CFD. When asked how different a fluids database would be, Peter confirmed that it was similar to a structural materials database as many properties are required but often the history of the material was lacking. From a CFD perspective the combination of materials and liquids needed to be captured (e.g in piston dynamics). Dan asked whether there were any industry standard fluids databases. The group were unsure although it was suggested that SAE may hold lubricating oils data. Martine flagged that as they were all interested in reducing CO<sub>2</sub> emissions, reducing friction through optimized lubricants was important. All agreed.

4.9 Vesna asked how the interest in welding and joining schema within the group could be progressed. Dan asked for a vote on whether a welding and joining schema project was a priority. All members voted in agreement that a project to develop a welding and joining schema should be developed (spot welding was identified as a priority). **(ACTION: GRANTA LEAD and ALL)**

4.10 Mark asked what was included and where the current library of schemas was held. Dan informed the group that there were currently three; metallic, composites and restricted substances. The MDMC are working on a wear and corrosion schema (although this was still in its early stages). Dan suggested that it would be useful for Granta to run a webex giving an overview of the current schema and how to use them; interest was expressed by the group. **(ACTION: GRANTA)**

4.11 It was agreed by the group that having an example database would be useful to start working on. Dan highlighted that often the standard database was the starting point and an organization then starts customizing and uses the range of importers available. To help with updates, Dan informed the group that the “data updater” capability was due to be released soon. Mark was unsure as to what was available and it would be useful to have a technical newsletter with upcoming tools news included from Granta. **(ACTION: GRANTA)**

4.12 Rayad asked that as a new user he was unsure as to the materials database capacity. Dan confirmed that limitations would be driven by an organization’s IT systems and how they were trying to use the data – i.e. what is the problem you are trying to solve? The session concluded with the plan of instigating a welding/joining schema development project, and a webex to provide an overview of the existing schema.

## 5 State of the Industry Session

5.1 Dan reminded the group that the “State of the Industry Report” was an idea that had been proposed in the earlier webexes. The question for the group was “would it be a useful document to be generated and released?” In support of generating and releasing such a document, Dan highlighted that it could be used to report on tangible outputs of the group (such as schemas). In addition, it could be used to provide the member companies with a strategic road map for developing capability, so if a company was at technical stage 1 how could they get to stage 2?

5.2 Mark thought that it would certainly be useful to understand the common areas and relative status of other companies. Mark went on to suggest that it might also benefit the group e.g. going to a software company as a collective and asking for things to be done or changed. All agreed that in this context the report would certainly be useful.

5.3 With respect to “Measuring the State of the Industry” example presented by Dan, it was agreed that there shouldn’t be too many roadmap themes and subjects to grade against. For each subject we could include not only a grading of where the industry is currently but what would the cost be of moving to the next step. This would be very useful for company stakeholders, Mark highlighted that it would be helpful for him at JLR to justify projects internally and identify the lower priorities.

5.4 Dan asked whether the “State of the Industry” report should be a document for the group only or should it be released to a wider audience (either in its entirety or just the executive summary). Peter proposed that only the executive summary be released to a wider audience whilst the detailed report remains within the group. He commented that although the idea of polling non-members was attractive, there was a risk that the value of the data would be diminished if contributors didn’t have a serious stake in the process. The group agreed that this would be a useful document for those in the consortium and it should be included in the future plan of work. First step is for Granta to circulate a draft ‘industry matrix’ as a proposal of the areas to cover and the definitions of the various steps in the roadmap. **(ACTION: GRANTA)**

5.5 Dan moved on to discuss the agenda items which related to data security, suppliers and restricted substances which were prioritized in the agenda poll but did not fit into the three technical sessions on the agenda.

5.6 Mark informed the group that JLR had gathered a lot of data across the business and managed it through “read or write” access. There was an increasing awareness, said Mark, about security issues and data, particularly as increasing numbers of individuals (e.g. contractors and global design users) could see and potentially download the data. Cutting down on the amount of data that individuals can see is increasingly important and as a result data security/access was an important issue which shouldn’t be removed from the consideration list. Peter totally agreed, companies have to think about whether their data be seen, released or misused? Access control, as a result, is important. Mark flagged that database usage “reporting” and whether data had been exported would be useful.

5.7 Vesna told the group that they are still learning as they are just beginning the process, but one of the problems they have is user scale. GM have large numbers of groups and users and asked the group how do others manage access or restrict viewing to certain types of data? Mark noted that different functions have differing interests in the types of materials data so ideally there should be

different access roles for users, and a way to ‘tag’ areas of the database by roles or programs, e.g. “chassis” which would dictate who could use the data. Mark asked if this approach were implemented how many different groups would need to be created? Vesna also asked whether the new access control system would be able to cope with individuals regularly moving groups. Mark confirmed that it could be complicated as each person had to be assigned to a group which was a manual process which needed to be updated and a more automated tool would be useful. Dan answered that the new access control system, to be covered in the next session, and the planned User Manager tool, would address many of these problems.

5.8 The group confirmed that tracking and reporting usage is a key driver, particularly with growing audiences, perhaps including more contractors and more risk of unintentional misuse of data between teams. Vesna agreed that they were very keen for Granta to address this, perhaps starting with CAD users and then widening access to other user groups.

5.9 Mark proposed that this would be useful to include in the “State of Industry Report” as on the whole we (group members) don’t own the IT so how to expand activities into these areas would be useful.

5.10 As a comment on the voting items list, Martine asked that tribological schema be included into the list of specific schema. **(ACTION: GRANTA)**

5.11 The discussion moved on to the topics of risk reporting with respect to materials selection, IMDS and restricted substances. Denise reported that she feels that GM do a fair job of risk reporting, IMDS is used but there is not 100% disclosure. With respect to the other topic areas supplier portal security was considered important. Sharing of restricted materials was an area that could be improved, particularly with the large number of users that GM have. Benoit informed the group that PSA use their own tool for capturing supplier declarations so suppliers have to work with both the PSA system and IMDS.

5.12 Dan asked the groups about how a supplier would assign materials to drawings, particularly if they use different systems. Denise replied that the supplier needs to be legally compliant but GM bought to a performance spec rather than a specific material, particularly for plastic and electrical components. Mark concurred that this was also the case for purchasing plastic components by JLR. For sheet metal purchases both Denise and Mark agreed that they (GM/JLR) exercised complete control.

5.13 Dan asked whether, in the situation of your organization and supplier both using Granta, companies share naming conventions? Peter believed that this was of interest with external material testing organizations. Mark wasn’t sure where supplier access to the database would be required as suppliers send CATIA files and have a copy of JLR’s materials library. Vesna/Denise confirmed that if required they send their “flat file” or preferred materials to suppliers but in other instances GM buy based on a spec or performance, there’s an element of trust involved between GM and the supplier.

5.14 When asked how organizations map between IMDS and their own specs, Mark and Vesna confirmed that they didn’t.

5.15 Dan asked the group about cutting and managing costs e.g. did they try to get cost information in front of designers as some Granta projects have looked to support this through colour coding



rather than absolute cost values (e.g. red – don't use, yellow – need approval, green – use). There's an element of changing behaviour required in the designer groups, suggested Dan, and so is cost a driver? Vesna liked the idea of "high, medium, and low" cost indicators and would be interested in potentially using it, particularly as there are confidentiality issues associated with absolute cost values. Dan pointed out that MI Viewer/Gateway could be used to flow through cost type information through the design process.

5.16 Mark asked whether it would be possible to prevent export based on attribute. Dan confirmed that attribute based access control was something that was being worked on, also colours based on data value is also a story that is being worked on.

5.17 Martine asked to give some feedback to the group about cost drivers. It is important to recognize that there are specialists who focus on this area, there are dangers of allowing CAE users to drive cost reduction activities, for example, by swapping to a cheaper material may look as though it has reduced costs but may require new production process – so costs are not necessarily comparable. The group agreed that the impact on the manufacturing chain when changing materials was a very significant point to consider with relation to cost reduction activities.

5.18 Dan highlighted that cost reduction was not just related to preferred materials and substitution but optimizing material dimensions e.g. to capture the "sweet spot" of material widths (as offered by suppliers). Arthur agreed that cost reduction was not just about absolute costs but included topics such as relative costs, cost/unit function and although Granta have tool that can do this it is not yet integrated with Gateway.

5.19 This section of the meeting concluded by recognizing the value of a "State of the Industry" report.

## 6 Granta Updates

6.1 Dan began the "Granta updates" session by flagging that in future meetings this session could include a report on how AutoMatIC has influenced Granta software development.

6.2 Dan highlighted that the GRANTA MI Version 8 update will include data synchronization. This will provide the capability of synchronizing some, but not all, of the data so, for example, this could potentially be of interest for sharing between sites, such as a European and a US part of an organization. Updates were also provided on access control, MI Explore, and "Easy Templates". With respect to the "Easy Templates", Mark highlighted that discrete data was not being used effectively at JLR and flagged that he would want schema to update with new "discretes". Dan agreed that this was a good idea but the capability did not yet exist. **(ACTION: GRANTA)**

6.3 With respect to access control, which had been raised earlier in the meeting, Dan explained that although the current access control system is secure, it is not so easy to change permissions dynamically over time. It is also difficult to see who has access. The new system is driven by the data and discrete data values can be used as access control attributes. Dan flagged that how each of the organizations applied their access control would be different based on their specific needs. Denise asked when this functionality would be available and Dan confirmed that the enhanced Access

Control would be included in MI8, released by the end of the year. An additional tool, to manage users and groups without involving IT, would be released in a later update early in 2015. As everyone would have different needs it would be useful to arrange 1:1 sessions to discuss requirements. **(ACTION: ALL)**

6.4 Arthur provided the meeting with an update of MI:Gateway and highlighted that the Gateway for Hypermesh would be released at the end of November 2014. The focus of the next stages of development work includes the goal of making Gateway more aligned with user expectations driven by the host CAD/CAE/PLM system – such as by supporting ‘part packing’. Dassault remains a priority, with ongoing discussions around V6 support, and they are aware of the Consortium. Richard asked the group members to let their contacts at Teamcenter know about the Consortium as it would facilitate Granta discussions with Siemens.

6.5 It was highlighted that Gateway could also be used to facilitate the traceability of materials selected by users. Benoit asked whether Gateway could be used as a tool to monitor users and view their queries (e.g. to provide a date stamped record of which materials were selected and when). This could be particularly useful if there was a model defect and the component history was required. Arthur flagged that there are several parts to the answer. Firstly, on an individual basis it could track when Gateway assigns the materials into CAD. On the client side, this can be logged, and from the server side, a central report could be generated. Granta are in the process of creating a new MI tracking service which could be used to capture user actions. Dan flagged that each company should talk to Granta Support or their services rep for guidance on how our current logging works. **(ACTION: ALL)**

6.6 The session concluded with everyone agreeing that the updates were of interest and should be included in future meetings.

### **7 Technical Session #3: Workflows**

7.1 Arthur facilitated the session on workflows and began by presenting a slide which represented the workflow of capturing test data and transitioning into CAE. Arthur asked the group as to whether this was the process they employed.

7.2 Vesna reported that GM run a slightly different process and CAE Subject Matter Experts and Materials Leads drive the process. As a result, the last two steps shown are redundant as they already have experts involved much earlier in the process. Mark flagged that the process used was dependent upon the CAE code and highlighted that there could many people involved in the process e.g. ODEC (Overseas Dedicated Engineering Centre) India, and test houses. The bigger issue associated with the process was the naming of materials.

7.3 Peter reported that at KSPG different roles are involved and as a result release managers are a key part of the process for them.

7.4 Arthur asked how could Granta/AutoMatIC help members with their workflows. Vesna flagged that it would be easier to track the whole process in Granta software; assign the responsible person in the process and once a step is complete they could check this off and the activity moves on to the

next step. This is more than just storing data in Granta, it is using the software to drive and manage the process. Mark agreed that a basic project management function, e.g. emailing the next person in the process step to let them know that the materials data is ready would be useful. Vesna, agreed and added that if someone emails a request the material lead could get the information and respond when completed.

7.5 Peter stated that in the past he has been interested in notification and release management (of the final material card) but there is also a need to show the quality of the data behind this even for the released material (switch on/off as required). This is relevant currently as the department that is developing the new materials wants to be able to compare the old and new materials (see and compare the first set of test results). Everyone wants to be able to see the difference. Benoit agreed that it depends on the data as to whether the validation tests are relevant or not. He went on to flag that the test data to CAE stage workflow could be exhaustive in the steps to qualification.

7.6 Dan confirmed that developing tools for managing the workflow are a high priority for Granta and access control is a part of this, email notifications could potentially be. There are, however, difficulties in making generic tools as approvals may be case by case, Dan added.

7.7. Mark flagged a number of other areas that would be useful: APIs (and tying APIs into the workflow) were a big priority for him as currently spreadsheets were passing between people and he'd like to automate the process as Granta is storing results and not a part of the workflow. Better graphing tools and, particularly, the ability to change colours would help. Wide ranging export format would also be of interest. Arthur flagged that it would be difficult to create and support "hundreds" of different types of exporters and we currently provide and support a selected set – but we could expand this set over time with the most common, re-usable models.

7.8 Arthur moved on to the "Materials Selection" example workflow and as a discussion point suggested that organizations don't want designers to have a completely clean sheet and this process could be used to capture rules for material selection. Vesna agreed and told the group that due to the very larger numbers of designers at GM they have done a lot of work in defining best practice and materials selection rules. Vesna offered to provide an overview of materials selection best practice either at the next meeting or through a webinar as required. **(ACTION: VS (GM))**

7.9 In contrast, Mark highlighted that for the BIW materials specification sheet (MSS) there was currently no way of checking where the data had come from.

7.10 This linked into the final example workflow of "Material Approval". Arthur asked the group what they believed Granta's software role (if any) was in supporting the material approval process.

7.11 Mark reported that this, to his knowledge, was not a process that JLR currently used. Peter agreed that KSPG were also not using this type of process. Dan queried as to where and how new materials came into the business. Mark answered that for plastics JLR were buying a part to meet a performance spec. In the case of stamping JLR work with the supplier but on the whole the suppliers tend to approach JLR. The part is often then tested as part of an assembly (e.g. crash) and the supplier needs to make the IMDS declaration.

7.12 Peter highlighted that they were in a slightly different position as they are in the middle of the supply chain. With respect to CAE, KSPG try to get the materials approval data. For some internally

developed parts we don't share this data with anyone else. Benoit agreed that the data is often held in their supplier. Arthur thanked the group as there were differences between Tier 1 and OEMs and it was important that Granta paid attention to the differences.

7.13 Arthur asked the group whether they were interested in materials rationalization. Mark told the group that they don't jump suppliers very much particularly as there was a lot of work going on between them. It was really down to the supplier if they can engineer to cost.

7.14 Dan asked GM if there was a process for what goes into the "Flat File" (Materials Library). Vesna replied that the file is owned by Materials Engineering and they recommend and approve materials. Sometimes a Tier 2 supplier component has to be analysed in CAE then GM have to get the materials properties as we need to test it for ourselves. Mark added that for JLR each new program copies the old materials data and adds to it and they are unsure what to cull.

7.15 Vesna queried whether this session could relate to the development of a workflow engine in which an admin could design workflow templates etc. Dan indicated that at this stage the agenda poll has been a guide for the day's discussions and certain elements have been highlighted as the basis for voting. From this, some topics will lead to tangible projects. Workflow is a high priority for Granta for the next 12 months. In this case, Vesna requested that the "test data to CAE" workflow be considered as a priority and asks whether we need to develop others? Dan responded that Granta would report back on progress in the Workflow area at the next meeting. **(ACTION: GRANTA)**

## **8 Consortium Process**

8.1 Richard Painter asked the group whether the meeting format and content has been useful. Peter reported that the first session (member updates) was particularly valuable. In future meetings he asked that topics be covered in more detail, provide more of an opportunity for a "show and tell" (without material data) and present what organizations are currently doing.

8.2 Richard informs the group that the MDMC meet for 2½ days x 2 a year and asks whether 1 day x 2 a year is enough for the Consortium? Arthur suggests that if there is to be more show and tell and group work more time might be required. The group discusses and agrees that 2 days would be more useful and other groups in their organizations might be interested in joining in sections of the meeting.

8.3 Richard raises the issue of recruitment to the Consortium and flags that it would be useful if members could attend the open webinars for other interested parties. Dan confirms that it is our intention to run an intermediate recruitment webinar between meetings.

8.4 The next recruitment webex meeting is planned to be held in early December to avoid shut down and holiday periods, it was noted that PSA would be unavailable 8/9 December. Granta to schedule this webinar. **(ACTION: GRANTA)**

8.5 Richard informs the group that GM have kindly offered to host the next Consortium meeting to coincide with the SAE World Congress in Detroit, MI, which takes place 21-23 April, 2015. The group respond that this is a good suggestion and they may be able to arrange for 1 person to attend from each organization. All members need to investigate and arrange travel. **(ACTION: ALL)**

## **9 Thanks and Meeting Wrap Up**

9.1 Richard Painter thanked the team from PSA for their generous hospitality and for hosting our first meeting. He went on to thank all of the members for their candid contributions which have made for such a positive meeting. The meeting closed.