

Environmental Materials Information Technology (EMIT) Consortium

Minutes of Steering Committee Meeting

Hosted by: Granta Design, Cambridge UK

12-14 April, 2016

ATTENDANCE

Members

Airbus Defence and Space	Jean Francois Mottaz
Boeing	Peter Mezey
Granta Design Limited	David Cebon, Will Martin, Nic Austin, Kim Marshall, Paul Ylioja, Steve Warde, John Cox, Jackie Cole, Patrick Coulter, Matt Kitson, Luca Petruccelli
Honeywell	Angel Cruz Walker, Doug Hall
National Physical Laboratory (NPL)	Graham Sims
Pratt & Whitney	Amra Peles, Rick Shanks
Rolls Royce	Andy Clifton, Steve Brennan, Amandeep Mhay
Bombardier	James Mallon
GKN Aerospace Ltd	Roderic VanHoof

By Phone

Airbus Helicopters	Cyrielle Gendre
Boeing	Brenda Fukai-Allison, Linda Thomas, Tom Sim, Jean Clampitt
Emerson	Amy Neal, Bob Rivett, Wesley Childers

SUMMARY OF ACTIONS

4.9	Granta will circulate the Python Notebook that Nic demonstrated	Granta
5.6(v)	Granta will arrange a Webex to discuss an improved schema for supplier management with the members – and attempt to modify the schema for vendors by the next meeting	Granta
8.6(iv)	Granta to review the options for customers to have a formal way to submit substance and list requires.	Granta
9.4(i)	Granta to re-circulate 2-page proposal for handling data on biocides.	Granta
9.7(iii)	Granta will propose an approach to handling and host a sample database on the web for review by EMIT members.	Granta
9.15	Develop a plan for Registration Risk	Granta
11.17(i)	Each company will provide: * A list of the specifications that they have mapped/indexed, using the agreed EMIT naming convention. * Future plans for mapping specifications. * A list of the information they have collected for each specification * A description of the QC Procedures they have implemented	All
17.2	Circulate logins for new EMIT member's website	Granta

18.3	Granta to re-circulate the request for feedback on BoM formats	Granta, All
23.7	Determine the interest of member companies in being able to generate EPDs for products.	All
24.2	Granta to consolidate the input from the meeting to prepare the five voting lists. Then run the consultation and voting process.	Granta, NPL

MINUTES DAY 1 (TUESDAY APRIL 12, 2016)

1 Introductions

- 1.1 Angel Cruz Walker took the Chair. He welcomed the members to the meeting.
- 1.2 The Members introduced themselves and their interest in the work of EMIT.
- 1.3 David Cebon welcomed the members to Cambridge.
- 1.4 The Agenda was reviewed. There were no changes.

2 Minutes of the last meeting

- 2.1 The minutes of the meeting held in Hartford CT on 28-30 September, 2015, were approved.
- 2.2 The actions from the minutes of the last meeting were reviewed as described in the table below.

Minute	Item	Responsible	Outcome
4.3	Laura agreed to share a document on procedures for maintenance and updating specifications with Granta so that it could be considered in the development of the Workflow Management system.	RR	To be discussed tomorrow
8.5, 10.4, 15.4, 19.5	Granta will consolidate the user and data stories from the breakout sessions and generate voting lists	Granta	Done
9.5	Granta to clarify the differences between RSDM and Material Universe in a Webex	Granta	To be discussed in this meeting
9.7	Granta will generate a template in Excel for a short dummy BoM in Excel which contains all permutations of bought-in and manufactured parts, both mechanical and electrical. Granta will circulate this to members for comment. Once the template is finalized, Granta will send it to members to populate	Granta	Done
9.8	Fall-back links should be an agenda item for the next meeting	Granta	Session tomorrow
9.9	Granta should review the potential ramifications of the 'once an article' regulation on the EMIT software.	Granta	IAEG is producing a position paper on this
10.5	Granta will circulate a document describing how the 'where used' data in the RSDM is generated.	Granta	To be discussed at this meeting
11.8	Granta pitch a strong business case to IHS about access to	Granta	To be discussed at

	data for standards		this meeting
18.9	It was agreed to hold a Webex to discuss these issues with the coatings database so that an improvement plan can be implemented.	Granta	One Webex was held. More discussion at this meeting
20.4	Andy Clifton will talk with Raj Takhar at RR (leader of ST4) to understand the situation around Class B declarations.	RR	Andy spoke to Raj Takhar. There does not seem to be a problem with material declarations.
20.5	EMIT members will attempt to influence the decision of IAEG WG1 ST4 at the October sub-group meeting to allow Class B declarations.	All	Done
20.6	Granta will review the opportunities in the HITEA and AMSCA projects.	Granta	Done
21.2	The Integration Epic should be split into two: one concerned with connecting computational codes and one concerned with connecting back-end database systems	Granta	Done
21.3	The members were invited to suggest additional epics for the software and data projects roadmaps.	All	Done
23.5	It would be useful to circulate an editable pdf of the meeting handout prior to the meeting so that participants could annotate an electronic version.	Granta	Done

3 Software and Data Development Process

- 3.1 David Cebon reviewed the software development process. He explained how the process has shaped the agenda of this meeting. He also reviewed Granta's long-term plans for the software system to put all the development activities into context.
- 3.2 David explained that Granta would like to refresh the EMIT/MDMC development process. Factors influencing this are as follows:
- (i) The current EMIT/MDMC development process has run since Sept 2013 (the last 6 meetings)
 - (ii) Granta has moved to 6-month release cycle
 - (iii) The 'transient' phase of the new process has been completed:
 - The software roadmap has reached steady state
 - All Epics have been 'cracked-open'
 - A large library of User Stories has been developed for the Epics.
 - (iv) Some Epics are partially complete – their User Stories need review and reprioritization prior to further development.
 - (v) Some Epics would benefit from some more detailed attention.
- 3.3 New regular session: Software Deep Dive. There will be one of these at every meeting:
- (i) These sessions will discuss software that will be developed in next 6-12 months
 - (ii) They will review and discuss the software design and interface

3.4 Revised session: User/Data Stories. There will be one User Stories session and one Data Stories session at each meeting. These sessions will:

- (i) Discuss software/data Epics prioritized for development during next year
- (ii) Review the existing list of user/data stories
- (iii) Review the progress on the Epic to date
- (iv) Add further user stories
- (v) Vote after meeting to re-prioritize the user stories

3.5 New type of session: 'The EMIT Report'

- (i) Aims:
 - Set the development strategy for 2+ years from now
 - Generate a view of 'where members are trying to get'
 - Review progress towards the destination
 - Help members tell Granta how to move forward
 - Help structure the strategic prioritization process
- (ii) Key Elements – there will be two main aspects to the report
 - Industry trends and drivers
 - Implementation process survey
- (iii) This will be turned into an Annual EMIT Report on the State of the Industry

3.6 Summary of the meeting:

- (i) Demos:
 - What's new in MI9?
- (ii) Software
 - Update on Strategy for Restricted Substances Solution
 - Deep-Dive: Workflow
 - User Stories: BoM Analysis
 - Gateway update
- (iii) Data
 - Data Stories: Substances Where Used
 - Data Projects: Various
 - MaterialUniverse and RSDM
 - Specification data: IHS project, sharing specification data
- (iv) Other Items
 - IAEG and IPC report
 - Granta collaborative projects report
- (v) 'EMIT Report'
- (vi) Member Presentations

4 What's New in Granta MI 9?

- 4.1 Nic Austin reviewed progress on MI9.
- 4.2 BoM Analyzer enhancements – assignment of surface treatment specifications
- 4.3 Release of the Product Intelligence package and BoM Analyzer.
- 4.4 Performance improvements – the project has continued with the current emphasis on speeding-up the Service Layer. Good progress is being made.
- 4.5 Gateway: Performance improvements – Nic demonstrated the reduction of time taken to Browse a tree in Gateway 3.0 and Gateway 4.0, which is much more performant
- 4.6 Data Updater: This module now generates a report of ‘what is in an update’ (before application of the data update); and a report on the outcome of an update once it has been applied to a database.
- 4.7 Workflow: This work has started and will be the subject of a software Deep Dive in this meeting.
- 4.8 Scripting Toolkit: Nic explained the scripting tool and demonstrated some things that can be done with the Python scripting tool. He illustrated the following:
 - (i) Open the database, make a connection
 - (ii) Search for all records with a defined CAS number
 - (iii) Write-out all the substances
 - (iv) Obtain the molecular formula and molecular name for each substance
 - (v) Strip out the NOCAS rows
 - (vi) Find the chemical structure for each substance using the CACTUS public web service – by CAS number, by molecular formula or by chemical name.
 - (vii) Use the public web service RDKIT to render the chemical structure of some of the substances.
 - (viii) Fitting a curve to experimental data
- 4.9 Granta will circulate the Python Notebook that Nic demonstrated. (ACTION: Granta)

5 Member Report – Boeing

- 5.1 Peter Mezey gave a member report for Boeing.
- 5.2 The main focus in Boeing is loading of reference data on regulations and lists, chemicals, materials and specifications/standards. Efforts are moving towards connection of parts, assemblies and products to the reference data.
- 5.3 To facilitate the core/reference data, important areas are around loading, maintaining and reporting on data. Some of the key stories in this area are:
 - (i) Granta reference data
 - Coatings: Rowan data is not usable in the current state
 - D-SS-02: Processing and joining specs
 - Other spec collections
 - Standard parts
 - (ii) All internal material specs and non-company reference data
 - Priority substances of Concern (PSOC) list
 - Chemical Restrictions and Banned (CRAB)

5.4 Roadmap projects

(i) Granta reference data:

- Coatings – what is the plan for Rowan data
- Other spec collections
- Industry standard parts

(ii) Company Reference data

- Import and maintenance of in-house data (in large quantities) (U-IO-01; E-I-03)
- Supplier Portal (U-IO-02) – this is key for Boeing and will become more important in future.
- Tabular attributes in general (performance in, out, ability to link across tables, reporting). This slows down the adoption of the tool (because reports need to be developed for more advanced use cases).

5.5 Peter has had difficulty finding documents on the EMIT sharepoint website Granta has new website, which will help this (discussed further in Section 17 of this agenda).

5.6 MI Features needed by Boeing:

- (i) Supplier portal – direct support for IAEG/IPC 1754
- (ii) Management of spec data – rollups, Algorithm for calculating coatings data
- (iii) Management of material data – e.g. a field to provide a unique value (e.g. Boeing Unique Identifier)
- (iv) Ad-hoc reporting – ability to provide a list of entities to report on; reporting on tabular data columns (local and linked data)
- (v) Maintain a database of producers/vendors – company buyouts and name changes... This is a new use case. The Supplier Management department is interested in ‘how many of our qualified materials are sole sourced?’ Granta will arrange a Webex to discuss this with the members – and attempt to modify the schema for vendors by the next meeting. (ACTION: Granta)
- (vi) Another opportunity is to generate TSCA export notification letters, based on whether a component contains substances with CAS numbers on the TSCA list. (NOTE: Granta)

5.7 Key milestones since last EMIT

- (i) Implemented MI9
- (ii) Spec data – BAC, BMS data loaded and maintained.
- (iii) PSOC list – looking into automation.

5.8 Major obstacles

- (i) Performance – CAS to Specs report previously ran PSOC list in 15mins which was a great improvement. This is currently not working after adding the BMS data to the database.
- (ii) Reporting on tabular attributes... Comparison reports do not allow reporting of tabular attributes. This is a key deficiency of the solution. (NOTE: Granta)
- (iii) Kit rollup feature / Auto generate coating
 - Ability to roll-up generic records for a kit.
 - Getting lists of CAS numbers into the reports list.

6 MaterialUniverse and Restricted Substances Data Module

- 6.1 Kim Marshall introduced the MaterialUniverse data module. It contains approx. 4000 material records, and hundreds of process records in ProcessUniverse as well as producers and references used to collate the data and links to equivalent materials in other databases. It is wholly developed, owned and maintained by Granta.
- 6.2 Key use cases for MaterialUniverse are:
- (i) Find and compare materials data
 - (ii) Materials selection and substitution
 - (iii) Informing product risk (including RS BoM Analysis)
- 6.3 Material Universe links out to a number of other reference databases that Granta maintains and acts as an index to the other databases.
- 6.4 RSDM contains MaterialUniverse and as well as the Restricted Substances tables (e.g. Legislations and Lists, Coatings, Specifications etc.).
- 6.5 Key use cases for RSDM are:
- (i) Materials comparison selection and substitution
 - (ii) BoM analysis – using generic substances to inform product designs or to fill gaps in company in-house data.
 - (iii) ‘Fallback’ links from in-house data
- 6.6 Kim asked members how they use the MaterialUniverse with their RS implementations.
- (i) P&W: Use it to fill gaps in data (e.g. for density). There is a lot of interest in using these data.
 - (ii) Honeywell: Use it directly to find information about concentrations, typical uses, restricted substances, legislation, etc.
 - (iii) Emerson: Use it to investigate materials and design for compliance.
 - (iv) RR: Use it understand the current and future risks of materials and processes.

7 Member Report – Honeywell

- 7.1 Angel Cruz-Walker gave a member report for Honeywell.
- 7.2 Honeywell’s Granta MI users are in the MDMC, EMIT and AutoMatIC consortia. Linking these users and harmonizing the data is important.
- 7.3 Honeywell DBs and Tools
- (i) Part-to-Spec relationship: Engineering Specification Matrix (ESM)
 - (ii) Material, Product and Substance Composition: Environmental Compliance Tool (ECT), Material Obsolescence (MO), IHS One Source for Engineering.
 - (iii) Spec usage, Status and Revision control: Aerospace Specification Index (ASI)
 - (iv) Material Properties, Regulations: Granta MI
- (i)-(iii) are being incorporated into TeamCenter, with a Gateway link to (iv)
- 7.4 Angel presented Honeywell’s schema for specifications for materials, processes and coatings in the RSDM. It would be useful to have a batch search of CAS numbers. (Note: Granta)

- 7.5 BoM analysis at Honeywell is a very time-consuming task. An APU could have a BoM with 3000 distinct parts linked to specs, materials and CAS numbers. This can lead to hundreds of thousands of rows of data. The Honeywell 'bottom-up' assessment starts with impacted specs and uses the 'where used' report. This has dramatically improved the efficiency of the Process.

8 Data Stories – Substances Where Used Data.

- 8.1 Kim Marshall presented the structure of Substances Where Used data in the RSDM and described the existing data stories in the Epic. Kim described the use cases for the data.
- 8.2 Paul Ylioja introduced himself. Paul worked as a REACH Consultant for the 3 years before joining Granta.
- 8.3 Paul described the importance of having good 'where used' data. He illustrated this with the development of the Restricted substances risk indicator for CES Selector, which relates to the total content of substances that are on the REACH Candidate list and SIN list. He explained the goals of the process for improving the information on restricted substances.
- 8.4 Paul explained the new process of finding where-used data for substances in materials. The approach is to find the main constituents of each material (e.g. base polymer, fillers, additives) and link these to the where-used substances and then roll-these up in the bulk materials (using % composition information). A similar approach is used to maintain substances associated with manufacturing processes. Where used data is collected for substances that are currently on the SIN list or the REACH Candidate list.
- 8.5 Additives included in the list of constituents for polymers:
- (i) Flame retardants – included for explicitly flame-retarded grades: Brominated, phosphates, borates
 - (ii) Stabilizers (heat, UV) – present when typically required (PVC), not in engineering plastics, e.g. Phosphates, alkyl tins, Pb and Cd compounds, Benzotriazoles and Benzophenones (UV). Included when explicitly included in material grade and if material has inherently poor UV stability.
 - (iii) Plasticizers – present for explicitly plasticized grades of material: Phthalates, phosphates
 - (iv) Pigments: Pb and Cd compounds, Chromates, combinations. The methodology assumes that these are not present in bulk materials because Candidate/SIN list pigments are rarely used (avoids false positives).
- 8.6 There was discussion about the methodology:
- (i) Rick Shanks: It is important for Granta to provide documentation of the procedure used for collecting this data. This could appear as an attribute note with a full document in the Help or other documentation associated with the database. (NOTE: Granta)
 - (ii) Emerson would use the RS indicator in material selection and particularly in process selection... Development engineers don't have this information. (NOTE: Granta)
 - (iii) Will Martin suggested that the IAEG substances list could be added for where-used data.
 - (iv) Peter Mezey suggested that it would be good to have a formal way for customers to submit substance and list requests. This could be done in an automated way and backed by a tracking system (such as JIRA). Granta to review the options. (ACTION: Granta)

8.7 Kim introduced a discussion of the user stories. WUD currently exists for:

- (i) Bulk materials
- (ii) Coatings
- (iii) A small set of adhesives
- (iv) A small set of electronic components.

There is currently no data for manufacturing processes (e.g. casting, EDM, anodizing) or standard components, or fluids (process fluids, device working fluids, etc.)

8.8 User Stories to add: (NOTE: Granta)

- (i) Processing fluids – used in manufacturing
- (ii) Effects of TSCA and IAEG – i.e. Where used data for TSCA substances
- (iii) Threats to production continuity from Asia – e.g. using materials that are not authorized for use in China.
- (iv) Materials from high-risk regions (e.g. conflict materials) – particularly the EU proposal.

MINUTES DAY 2 (WEDNESDAY APRIL 13, 2016)

9 Restricted Substances Data Projects

9.1 Will Martin summarized recent work on data projects. He also reviewed the data projects plan for 2016.

9.2 RSDM 5.4, October 2015. Additions were:

- (i) IEC 6274
- (ii) India E-waste (management and handling) rules 2010.

9.3 RSDM 6.1, January 2016 – focus on Asian regulations (a package including some extra items not voted by EMIT)

- (i) Updates and additions to Chinese Legislations
- (ii) Update and additions to South Korean Legislation
- (iii) Update and additions to Japanese Legislation
- (iv) Update to MIL Specs to follow EMIT ‘type-class-grade’ naming format

9.4 Voting Review

- (i) June 2015 Legislation vote:
 - Biocides – delayed, pending some feedback from EMIT members on 2-page proposal on biocides. Will to re-circulate this to members. (ACTION: Granta)
 - Korea REACH done, 2 Japanese lists – done; WHO Carcinogens, not done.
- (ii) November 2015 Vote:
 - Japanese and Chinese lists – done; WHO Carcinogens, next release
 - US Consumer Product Safety Act, TBD, pending further information from EMIT members

9.5 RSDM 6.2 April Release to contain

- (i) IARC + substance classification
- (ii) CLP ATP updates
 - Skin sensitizers are a possible future project, pending more feedback from EMIT members.
- (iii) Coating updates
- (iv) RoHS2 EU and China updates
- (v) CoRAP updates

9.6 RSDM 6.3 July release possibly to contain:

- (i) TSCA updates, potentially CPSA
- (ii) Biocidal products (TBD)
- (iii) MaterialUniverse Where-Used data (TBD).

9.7 Coatings database progress:

- (i) A Webex was held with EMIT members and meetings were held with Rowan. All records in the table were reviewed.
 - The data was checked for inconsistencies with MIL specs
 - Similar coating records were consolidated
 - New records added
 - TRL wording was 'toned-down'
- (ii) The % values for substances remaining in coatings was made more precise, using supplier data, industry data, REACH applications for authorization and chemical analysis of coatings for a theoretical upper bound.
- (iii) There are some outstanding questions needing review on management of information about pre and post treatments. Granta will propose an approach and host a sample database on the web for review by EMIT members. (ACTION: Granta)

9.8 Paul Ylloja presented a discussion of Material Risk indicators.

- (i) One problem is "Restricted substances are banned, but some are 'more banned' than others".
- (ii) Banned with conditions – e.g. banned for specific uses (REACH restriction) or broad uses, (REACH Authorisation with allowed exemptions).

9.9 The team has been thinking about 'regulatory noise' – particularly press activity around particular chemicals.

- (i) Google search records have been used to measure interest in particular substances on the web. This data has the problem of being highly time dependent.
- (ii) Other options are:
 - Numbers of consortia/groups investigating the substance
 - Numbers of legislations involving the substances
 - Numbers of registered uses of the substance

9.10 For users there is a high risk of obsolescence if there are few registered producers/importers because there are fewer stakeholders to fight for continued use. If tonnage is low, registered users may stop supply to de-risk their product portfolio. Paul presented a case study on registration of chemicals, showing chemicals with a critical risk of obsolescence because there have not been any registrations, and chemicals with a risk of obsolescence because of low tonnages.

- 9.11 Paul presented some concepts for conveying material risk, plotting Legislation TRL and ‘noise’ measured by the number of regulations incorporating the substance. He showed how this type of display could be used to select substitute coatings.
- 9.12 Steve Brennan suggested that it would be worthwhile to test the methodology against ‘industry reality’ – for TRLs.
- 9.13 Amra Peles suggested that risk metrics should ideally be based on probabilities.
- 9.14 Granta needs feedback from members on:
- (i) Biocidal products regulations
 - (ii) Coatings improvements
 - (iii) Material risk indicators and REACH risk metrics
- 9.15 David Cebon said that the Registration risk is very clear and should be the starting point for the next phase of work. It was agreed to start by developing a plan for Registration risk. (ACTION: Granta)

10 Member Presentation Pratt & Whitney

- 10.1 Amra Peles presented a member update for Pratt and Whitney. The project is called ‘Achieving competitive excellence in REACH’
- 10.2 Objectives are:
- (i) Implement materials information and data management to support critical P&W decisions related to environmental legislation and environmental impact.
 - (ii) Enable designers to incorporate up to date information for RS in early design stages and assess environmental impact at all stages in design
- 10.3 Amra presented the overall future state of software for RS and RS mass roll-up calculation. For new design, this will require communication between CAD and PLM data and restricted substance data. For legacy parts the BoM analyzer will be used.
- 10.4 P&W is currently upgrading to MI 9. The specification deviation process is currently being setup. Importers for engines and parts have been completed.
- 10.5 Implementation future state:
- (i) A federated infrastructure with access to internal (CAD, PLM, Granta) and external information (IHS, MSDS, etc.)
 - (ii) These will be integrated together with workflows and dashboards.
- 10.6 Peter Mezey explained that Boeing has moved their MSDS documents into Granta where the information can be linked-up with all the reference information. This has required some code to index the documents and prepare them for importing.
- 10.7 Wish list for software:
- (i) Importing
 - (ii) Automating searches
 - (iii) Help with Python coding.

11 Specification Data

- 11.1 Will Martin introduced a discussion on specification data.
- 11.2 Granta has been talking with IHS since the last meeting.
- (i) IHS has pitched the idea to SAE and ASTM
 - (ii) The emphasis is that very little data from each standard is needed and it will improve the usage of their data.
 - (iii) SAE Head of Product Strategy and a representative from IHS will be visiting Granta on 15th April to plan next steps.
 - (iv) The initial focus will be on surface treatments. Future work will be on standard industry parts.
- 11.3 Will presented some screen shots of how the system will work.
- 11.4 Steve Brennan from RR presented a discussion on sharing of specification data. He explained how the links between specifications (and equivalents), formulations, substances and regulations is being created in RR. Within RR, the Granta RSDM is the executive source for spec-to-substance data.
- 11.5 RR has had their industry standards mapped by a subcontractor for importing. A spot check on accuracy of this process has indicated an accuracy of 99.5%. Approximately 1500 Industry standards have been mapped. This data could potentially be made available for sharing with EMIT members. The data contained is spec identification, call-outs, links to formulations, etc. It could be used as a starting point for indexing the IHS specifications. Amandeep pointed out that this work had taken the contractor two years.
- 11.6 Boeing may be able to provide similar data. It could also contain information about qualified products. P&W and Honeywell would also be willing to contribute to this source of information about industry specifications.
- 11.7 Steve Brennan suggested that each company could provide a list of specification codes that they have mapped/indexed. Then Granta could work out an overall plan and some kind of agreement with the companies. Specifications processed in this way need to use the EMIT naming convention. The agreed process is as follows:
- (i) Each company to provide: (ACTION: All)
 - A list of the specifications that they have mapped/indexed, using the agreed EMIT naming convention. It would be useful to also include their future plans for mapping specifications.
 - A list of the information they have collected for each specification
 - A description of the QC Procedures they have implemented for guaranteeing the quality of the data
 - (ii) Granta will compile this information to provide an overall content plan and commercial plan for the specifications data and feed this back to the members for review.
 - (iii) We will review the outcome at the next EMIT meeting.

12 Member Presentation - GKN

- 12.1 Roderic VanHoof from GKN gave a brief presentation on REACH activities at GKN.
- 12.2 GKN has 53 separate sites. Until recently each site was responsible for its own REACH compliance. Roderic's task is to have a unified response to REACH across the organisation. He is currently gathering a big picture of where the organization is today.

- 12.3 Substitution of chemicals is a key issue across the company. For a Tier-1 supplier a specific challenge is introducing substitutes that are acceptable to all customers and match all specifications.
- 12.4 GKN would like to be able to upload all of their MSDS sheets into Granta MI: to identify SVHCs, and output risk levels, identify the possibilities for substitutions, and record which customers have accepted which substitutions. For new products they would like to be able to identify the risks associated with a BoM and what solutions are required for authorisations. (NOTE: Granta)

13 Software Deep-Dive - Workflow

- 13.1 Matt Kitson from Granta presented a software ‘deep-dive’ session on Workflow. This work is currently in the design phase.
- 13.2 Matt explained the need for workflow management
- (i) Control: e.g. ensure that records pass through an agreed sequence of steps
 - (ii) Automation of work processes – e.g. change control process.
- 13.3 The immediate plan in Granta is to develop a request/approval system for records in MI. Future plans will be to extend this capability to more general workflows.
- 13.4 Matt described the overall architecture of the Workflow management system, which includes a new Workflow service and authoring system as well as a set of interface tools for managing workflows.
- 13.5 Matt explained a typical step in an approval workflow. For each step it is necessary to define user **roles**, record **states**, allowable **actions** and **forms** for displaying information to the user.
- 13.6 Matt showed some example steps and forms and showed the workflow for a typical journey creating a new test data record. The system will use some additional attributes in MI records to maintain information about the status of the workflow.
- 13.7 Matt showed some mockups of user interface screens.
- 13.8 Rick Shanks:
- (i) There needs to be an Administrator function with a dashboard and workflow filtering criteria – to manage the very large number of workflows that may be in the system.
 - (ii) There needs to be a function to return the record to the previous person in the workflow with comments.
 - (iii) This tool will be very valuable for P&W to maintain RSDM data – e.g. when there is a specification change.
- 13.9 Doug Hall:
- (i) User submits a request for information about a missing material.
 - (ii) User looks for a particular property of a material that is not available.
 - (iii) A system for helping users to prioritize requests for new materials to be added to the database.
 - (iv) Manage a test data request and fulfillment. Iterate with a supplier on both test definition and the test process... e.g. have a supplier enter the data they have generated so far (e.g. some fatigue points), review the data to date, send the next test conditions back to the test house.

13.10 Amandeep Singh:

- (i) RR would use this for small workflows, e.g. release of design data. Request for changes to specs are done outside the Granta system because of the interactions
- (ii) Switching-on version control on release of a record
- (iii) It is important to store traceability of the workflow process – e.g. in a cumulative log file, including comments/dialogue that occurred during the process.

13.11 Amra Peles/Rick Shanks

- (i) Request and manage a supplier declaration. This may require an automated in-box.
- (ii) It would be useful for suppliers to be able to initiate a workflow when they make a design change. ‘We have made a change to this part and would like you to approve it’. Alternatively, this workflow could start when a message from the supplier lands in an automated In-box. This would require email messages to be able to have special subject lines that contain information about workflows.
- (iii) External systems (e.g. PLM) to be able to initiate workflows – e.g. for specification updates.
- (iv) Approvals workflows could require series or parallel approvals from individuals or groups of individuals or could require an administrator to assign the specific approvals workflow.

13.12 Peter Mezey

- (i) If a material is not on the TSCA approved list, generate a message to a toxicologist
- (ii) Specification updates or database updates from Granta.

14 Member Presentation, Rolls Royce

14.1 Andy Clifton gave a member presentation for Rolls-Royce.

14.2 Dodd Frank: Supreme Court judgement has delayed the need for organizations to declare conflict/non-conflict materials for the 30th May deadline (organizations can still declare as ‘indeterminable’).

14.3 EU conflict mineral proposals:

- (i) Jan 2016: EC released a compromise position requiring declarations from smelters and refiners only
- (ii) Feb 2016: Dutch presidency wanted mandatory declarations for all downstream companies. Opposed by 4 countries.
- (iii) Apr 2016: Proposed mandatory declarations for smelters and refiners, importers above a certain volume, and all upstream importers. There will be a 4-year transition period with conflict zones to be defined annually by the EC.

14.4 UK ADS group Engineering Doctorate: This project is looking at standard metrics for measuring common environmental indicators – e.g. energy footprint, water footprint, etc. The student has investigated bottom-up and top-down approaches on parts at RR, Boeing, Airbus, etc. The various methods can be up to an order of magnitude different to direct measurement. It appears that approximations based on generic data may be most effective.

14.5 Clean Sky II (PLEIADES)

- (i) A €2.5m project has been approved by Clean Sky for integrating Eco Design tools into industrial design processes. The bid was won by a Granta-led consortium involving University of Surrey, Thinkstep and University of Stuttgart.

- (ii) Other future Clean Sky projects may be of interest, including
 - Measuring social value of aerospace
 - Closed loop material flows for metallic
 - Recycling of composites
 - Process selection
 - Material selection

15 Update on Strategy for Restricted Substances Solution

15.1 Will Martin and Nic Austin gave an update on Granta's overall strategy for restricted substances software.

15.2 Will presented Granta's review of the overall landscape. Key use cases are:

- (i) Reference data only
- (ii) Material and process risk management
- (iii) Material guidance for conceptual design
- (iv) Material guidance for detailed (CAD) design
- (v) Compliance reporting – non-MI assignments (legacy BoM Analysis)
- (vi) Compliance reporting MI-based assignments
- (vii) Compliance reporting – integration with 3rd party solutions
- (viii) Supplier portal.

The three priority areas are (ii); (iv) and (v)

15.3 Will presented the overall high-level architecture for the M&P risk management solution and explained the basic software requirements for BoM analysis.

15.4 Nic Austin presented the four key solution components:

- (i) BoM store (typically in PLM). Maps products to parts
- (ii) M&P Risk management system. Maps specs to substances
- (iii) A-BoM store (Analysis-BoM). Maps parts to specs
- (iv) Analytics engine: generates analytics from A-BoMs

15.5 Most Granta customers with the M&P risk solution would like to use the Granta analytics engine. Many, but not all would like the Granta A-BoM store. None need a BoM store. Consequently, a fully-Granta solution is not possible, nor desirable. The A-BoM store needs to be isolated behind services so that it can be integrated with in-house systems.

15.6 The M&P risk management component will be based heavily on the existing RSDM with some enhancements.

15.7 The A-BoM store component will be based on Granta MI and will include tools for:

- (i) Import/export
- (ii) Mapping
- (iii) Supplier declaration
- (iv) Web apps
- (v) Maintenance
- (vi) Integration with non-Granta A-BoM stores – e.g. in-house tools.

15.8 The Analytics Engine Component will be based on Granta's custom reporting platform. It will incorporate Asynchronous reporting and additional reports.

- 15.9 Peter Mezey commented that this proposal hits the large majority of features that Boeing need. It will be necessary to prioritize the development to meet member needs. Nic noted that the M&P Risk management solution would probably be completed in the first phase.
- 15.10 Steve Brennan commented that this solution would integrate the RS components in RR.
- 15.11 Andy Clifton commented that purchasing tend to target particular suppliers rather than particular BoMs. It would be helpful for the system to be able to have a supplier bias rather than a product bias. (NOTE: Granta)
- 15.12 Amra Peles likes the overall architecture. She asked about the reporting capabilities.
- 15.13 Angel Cruz commented that the key aspect of this system is integration with other systems.

16 Member Presentation, Bombardier

- 16.1 James Mallon presented a member presentation for Bombardier.
- 16.2 Data collation:
- (i) Bombardier is an agglomeration of 5 different companies, each with their own specifications.
 - (ii) Deviations from specifications are in scanned pdfs
 - (iii) Materials purchased against the master approved list is in a SAP database
 - (iv) CAS number information and material codes are in a SAP database
- 16.3 The Bombardier Engineering Amalgamated Search Tool (BEAST) was built in Excel: to pull all of this information together. James demonstrated the tool. It can be used to:
- (i) Identify all specs with SVHCs by relating spec to material to CAS number
 - (ii) For legacy programs – specs are read off drawings.
 - (iii) In cases where SVHCs are identified, they are declared, irrespective of the amount.
 - (iv) Data is more accessible on newer programs.
- 16.4 BEAST limitation. No linkage to part numbers. This has been tackled by:
- (i) Attempts to OCR scanned paper drawings to obtain specification information have not been very successful... but this is work in progress.
 - (ii) CADD5 and CATIA v4/5 drawings can be processed automatically to find specifications in drawing notes. Bombardier may be willing to share this experience with Granta. (NOTE: Granta)
- 16.5 The supply chain department (internal and external) have not fully bought-into REACH requirements... they see it as an engineering issue. There has been a recent proof of concept exercise on processing legacy BoMs, using BoM Analyzer in MI9. This is working well.
- 16.6 Medium/long-term goal:
- (i) Designers input data which is captured at source
 - (ii) Weights information captured at source
 - (iii) Specs and deviations are change-managed on a regular basis
 - (iv) Third party declarations fed into systems via a template and supplier portal
 - (v) Material CAS numbers maintained by 3rd party SDS company
 - (vi) Global legislations tracked and referenced against core data in the system
 - (vii) Legally compliant reports issued upon demand to customers
 - (viii) MI becomes the repository for all materials R&D data.

16.7 Obstacles

- (i) People fixated on accurate SVHC content in finished parts – needs to change
- (ii) Capturing data from legacy programs is slow and thankless... need a method for doing this easily.
- (iii) Would like more self-help via manuals or online for MI (NOTE: Granta)
- (iv) Industry bodies need to lead!

16.8 It would be useful for companies to be able to share mapping data so that internal company spec translations and call-outs can be shared.

17 New EMIT documentation and member website

17.1 Steve Warde mentioned that two members of the Granta documentation team will be coming to the meeting for lunch tomorrow and would welcome input about documentation from members.

17.2 A new EMIT member's website is being built, based on the new 'My Granta' website tool. Steve demonstrated logging into the EMIT member's website. It can be used to see all documentation from previous meetings. Steve will circulate logins to EMIT members in the next few weeks. (ACTION: Granta)

18 User Stories – BoM Analysis

18.1 Will Martin presented a User Stories session on BoM Analysis.

18.2 Will demonstrated the existing Granta tools.

- (i) He illustrated a BoM Generator tool in Excel; mapping spec numbers; and creating an XML BoM
- (ii) Will read the BoM into BoM Analyzer and showed some reporting
- (iii) He stored the XML BoM and Report back into an MI database.

18.3 Will reviewed the EMIT BoM format in detail. The details were discussed and some deficiencies identified – e.g. being able to assign specifications to part containers. Will to re-circulate the request for feedback on this item. Members were asked to provide a small extract of their most complicated BoM format so that Granta can ensure that all edge cases are covered. (ACTION: Granta, All)

19 Member Presentation - Emerson

19.1 Amy Neal presented a member update for Emerson, which has been using Granta MI for about 10 years.

19.2 Emerson has 70 different independent business units in 5 different product groups. The challenge is communicating the availability of the tool to end users.

19.3 The system has tailored material modules for Emerson's needs. It is integrated with preferred materials and suppliers.

19.4 Targeted uses for Granta MI are:

- (i) Product Design
 - Strategic materials assessment
 - Materials information
 - Material comparison, selection and substitution
 - Proprietary information for resin performance
 - Environmental performance analysis

- Metals equivalency
 - ASME Boiler and Pressure Vessel Code
- (ii) Ensuring compliance
- RSDM
 - Environmental Performance Analysis: Eco Audit
 - Materials Substitution
 - Emerson Monitored Materials list
 - Conflict materials

19.5 Emerson has rolled-out a new home page with an emphasis on simplifying the user experience, standardized interfaces using MI Explore and embedded training videos.

19.6 Open concerns are:

- (i) Coping with materials substitution as restricted substances drive suppliers to substitute substances – risk of undocumented change.
- (ii) Coping with REACH Registration 2018 – figuring out which substances matter (particularly niche materials) and whether or not they are in the process of being registered. This is not just a European problem – but is global.
- (iii) Managing the implications of the ‘once an article’ regulation.

MINUTES DAY 3 (WEDNESDAY SEPTEMBER 30, 2015)

20 Update on MI: Gateway

20.1 Jackie Cole introduced herself and gave a presentation about MI: Gateway.

20.2 Gateway development focus over past 6 months

- (i) Gateway 4.0
 - User experience enhancements,
 - Improved performance
 - Parameterized CAE support – choose parameter values during CAE data export
- (ii) Gateway 4.1
 - Change notification emails
 - Preview of CAE models – previewing and editing during the export process

20.3 Jackie introduced a discussion of interactivity between client applications

- (i) She introduced ‘MI: Connect’- which is a client-side application for connecting MI to 3rd party data systems such as PLM systems. It has been implemented to enable ‘where used’ queries of assignments in TeamCenter. Peter Mezey asked whether MI: Connect could be used to do bulk assignments of materials in PLM systems. Jackie said this should be possible. It would need an ID mapping system.
- (ii) BoM analyzer is being extended to support multiple editable Surface Treatment specs

20.4 Focus area next 12 months

- (i) Near term
 - Scripting toolkit v2.0 with Python (now released)
 - MI: Explore v3.1 – enhanced performance
- (ii) Mid Term
 - New features in MI:Explore – file upload and reporting
 - Further enhancements to Gateway: Extensibility of data model, enabling multiple processes, surface treatments
- (iii) On-going PLM integration evolution
 - Evolution of TeamCenter and Windchill Gateways
 - Enhanced integration with latest data model in TeamCenter

21 Member Presentation – Airbus Defence and Space

21.1 Jean Francois Mottaz gave a member presentation for Airbus Defence and Space

21.2 The focus is on REACH and Obsolescence management at M&P level

- (i) Implement a tool to cover: legal requirements for REACH, sustainability aspects, obsolescence
- (ii) Chemicals, substances lists of substances

21.3 There are currently two existing tools that are not connected:

- (i) Excel database for
 - Inventory of chemicals used within company
 - Impact analyses
 - Regulatory compliance
 - Sustainability analysis and anticipation of obsolescence
- (ii) SAP-EHS
 - REACH regulation compliance
 - Article 33 calculations and reports
- (iii) The company would like all of these tools to be integrated, using Granta MI, but SAP will still need to be used for REACH compliance.

21.4 Airbus D&S would like immediate REACH updates so that REACH impact reports could be delivered to customers within the same week. Quarterly is not sufficient. (NOTE: Granta)

22 EMIT Report

- 22.1 David Cebon introduced a new session entitled 'EMIT report'. This is based on an activity previously introduced by the AutomatIC consortium. The aims of the session are:
- (i) Gain a view of 'where members are trying to get'
 - (ii) Review of Consortium's progress towards the destination
 - (iii) Help members to tell Granta how to move forward
 - (iv) Help structure the strategic prioritization process
 - (v) Set EMIT software and data strategy in 2+ years from now
- 22.2 The two main components of the EMIT report will be:
- (i) Industry Trends and Drivers
 - (ii) State of the Industry report.
- 22.3 There was a discussion of Industry trends and drivers. The list of voting items for the Industry Trends and Drivers was edited and updated.
- 22.4 There was a discussion of the items in the State of the Industry report. The list of voting items for the self-assessment survey was edited and updated.
- 22.5 Members requested to be able to assign 'N/A' to those items they do not plan to implement.

23 IAEG, IPC and Granta collaborative projects

- 23.1 Will Martin gave an update on the activities of IAEG. The IPC 1754 standard is targeted for publication mid 2017.
- 23.2 Feedback from IPC meeting:
- (i) The bulk of meeting was concerned with processing comments from IPC1754 working draft
 - (ii) Decisions requiring IAEG input summarized for tabling at IAEG
 - (iii) IAEG are developing a NOCAS system and new DSL – targeted June/July 2016
 - (iv) Potential challenges:
 - The standard should be open to other industries – e.g. construction, with the right to use own declaration list, process substances now optional...
 - If IAEG are not willing to provide detailed guidance and training on how to fill out the declaration form, how will data quality be assured?
- 23.3 The next meeting is at the end of May in Washington DC
- 23.4 Luca Petrucci introduced environmental activities in the Granta Collaborative Projects team. The team has 3 members. It focusses on projects on Additive Manufacture, Composites and Environmental issues.
- 23.5 Luca described the HITEA and AMSCA projects:
- (i) HITEA: Identification of candidate replacements for Hex chrome for aerospace applications.(April 2013 to Sept 2015)
 - (ii) AMSCA: Develop new Hex Chrome free sacrificial coatings for steel for aerospace. Candidate systems to TRL5 (June 2014-May 2017)
 - (iii) Granta MI has been used in both projects to collect test data for many coating systems. It is planned to merge the databases from the two projects. MI Explore will be used to visualize images collected from many test specimens.

23.6 PLEIADES: ‘Project to Lead Ecodesign Integration with Aerospace Development and Engineering Systems’. €2.5m project, funded by the Clean Sky programme, starting Jun/July

23.7 Knowledge Transfer Partnership (KTP): The aim is to apply Granta tools to the built environment sector. The main focus is on generating Environmental Product Declarations (EPDs). Luca asked about EMIT member’s interests in EPDs:

- (i) Bombardier’s DfE team in Montreal is interested in having an EPD system to generate an EPD for the whole aircraft.
- (ii) The IAEG has some interests in this area. Brenda will discuss this with Boeing R&T experts involved in IAEG. Andy Clifton will talk with Raj and Steve Brennan. It was agreed that everyone should find out about their company’s interest in generating EPDs (ACTION: All)

24 Clarification of voting items

24.1 David Cebon reviewed the items that need voting after the session:

- (i) Legislation and Lists – the normal prioritization vote.
- (ii) Data stories: There will be a vote to prioritize data stories for the ‘Where Used Data’ Epic
- (iii) User Stories: There will be a vote to prioritize user stories for the ‘BoM Analysis’ Epic
- (iv) EMIT Report:
 - There will be a vote on the importance of the various items listed under Industry Drivers and Trends
 - There will be an opportunity for each member to indicate the status of their implementation in the ‘State of the Industry’ Report.

24.2 Granta will consolidate the input from this meeting to prepare the five voting lists. These will be reviewed in a Webex. Members will then be asked to vote in the subsequent month, prior to a review of the results by Webex. (ACTION: Granta/NPL)

24.3 Voting Timetable, added after the meeting:

Task/meeting	Date/time
Granta/NPL circulate legislation list	Friday 13th May
Members to contribute any additions	Friday 20 th May
Granta/NPL to circulate all voting lists	Friday 27 th May
Telecon to discuss voting list	Wednesday 1 st June, 4pm BST
Members submit votes to NPL/Granta	Friday 1 st July
Telecon to review results	Wednesday 13 ^h July, 4pm BST

25 Review of meeting

- 25.1 Rick Shanks noted that the Deep Dive session was very good. It generated a lot of ideas.
- 25.2 Brenda noted that it was very useful to have the session on overall EMIT strategy.
- 25.3 Members thought that the EMIT Report session was foundational and very useful. The report will provide a useful benchmarking tool for the member companies.
- 25.4 Member presentations and discussions were very good – and the presentations from new members were interesting.

26 Vote of Thanks

26.1 David Cebon thanked Abbie Fung, Steve Warde and the team at Granta for organizing a superb meeting.

27 Date of next meeting

27.1 The next meeting is tentatively scheduled for 24-26 October, 2016., to be hosted by Emerson in Columbus Ohio.

DC, KM, GS
18 April, 2016