Date: Thursday, September 28th, 2017  
Time: 12:45 – 14:15  
Place: Riverbank R3 located at Lower Level in Adelaide Convention Centre  
Chair: Akira Tsuchida (M2), Co-chair: Peter Swan, Ph.D. (M4), David Raitt, Ph.D. (M4)  
Secretary: Dr. Hatsumi Ishida (Back-up Mr. Yuto Suzuki (he will be there))

Agenda:
1. Opening Remarks  
   Akira Tsuchida  
2. Self-Introduction (if required)  
   All  
3. IAA Commission III meeting (Sep 23) result  
   Peter Swan  
4. IAA Report Development Status and catch up schedule  
   Akira Tsuchida  
5. Space Elevator Feasibility Prediction Index  
   Peter Swan  
6. IAA Report Chapter Five and Six contributor selection  
   Akira Tsuchida  
7. Next meeting schedule  
8. Others

Minutes of Meeting:
1. Opening Remarks  
   Akira Tsuchida  
   Chair Tsuchida stated leadership of SG3.24 has a goal to conclude draft of IAA report by Christmas this year, so all members of this study group are requested to help them.

2. Self-Introduction (if required)  
   All

3. IAA Commission III meeting (Sep 23) result  
   Peter Swan  
   Co-chair Swan reported it went well. Also he stated “Heinlein Prize Trust” (in Houston, USA) committed to support to publish this IAA report. It is good news.
As we reported at commission 3 meeting on Sep 23, our draft report status is as follows:

(Leadership team provided all study group members draft report on Sep 19 by Mr. Yuto Suzuki)

<table>
<thead>
<tr>
<th>Chapter One – Introduction [drafted]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chapter Two – Mission Definitions [drafted]</td>
</tr>
<tr>
<td>The Space Elevator Vision: Provide Low-Cost Access to Space</td>
</tr>
<tr>
<td>Chapter Three – Performance Needs [drafted]</td>
</tr>
<tr>
<td>Chapter Four – Technology Needs leading to Critical Technologies [drafted based on spider chart]</td>
</tr>
<tr>
<td><strong>Chapter Five, Six – Risk Reduction [to be drafted]</strong></td>
</tr>
<tr>
<td>Chapter Seven – Conclusions [will be done at the end]</td>
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</tbody>
</table>

Leadership Team (co-chairs, secretary) + several active members (ex. Dr. Yoji Ishikawa, Dr. John Knapman, Mr. Vadym Pasco) needs to focus finalizing this report by end of this year.
Catch-up schedule is shown below:

<table>
<thead>
<tr>
<th>Target Date</th>
<th>Things to do</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sep 28, 2017</td>
<td>Chapter 5/6 Contributor assignment</td>
<td>✓</td>
</tr>
<tr>
<td>Oct 31 (Tue)</td>
<td>Chapter 5/6 Contributor input due</td>
<td></td>
</tr>
<tr>
<td>Dec 22 (Fri)</td>
<td>Leadership’s draft due for editor’s cleanup</td>
<td></td>
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<tr>
<td>Jan 7, 2018</td>
<td>Editor’s clean up due and submit for SG3.24 members review</td>
<td></td>
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<tr>
<td>Jan 26 (Fri)</td>
<td>SG3.24 members review due</td>
<td></td>
</tr>
<tr>
<td>Feb 25 (Sun)</td>
<td>Update for Final Draft and submit to commission 3</td>
<td></td>
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<tr>
<td></td>
<td>(commission 3 review requires 2-3 months)</td>
<td></td>
</tr>
<tr>
<td>Mar 26 (Mon)</td>
<td>Notification of Final Draft review in commission 3 meeting, IAA Spring meeting in Paris</td>
<td></td>
</tr>
<tr>
<td>May XX</td>
<td>(Option) as a part of commission 3 review, Mr. Vadym Pasko presents about sg3.24 presentation in IAA regional meeting in Ukraine</td>
<td></td>
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<tr>
<td>May 25</td>
<td>Commission 3 review due</td>
<td></td>
</tr>
<tr>
<td>June 29</td>
<td>Incorporate comments from commission 3 review</td>
<td></td>
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<tr>
<td></td>
<td>And Formal request to commission 3 to endorse Final Report</td>
<td></td>
</tr>
<tr>
<td></td>
<td>for peer review (one reviewer from each commission, 30 days)</td>
<td></td>
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<tr>
<td>July 27 (Fri)</td>
<td>Cover page design due</td>
<td></td>
</tr>
<tr>
<td>Aug 3 (Fri)</td>
<td>Submit SAC review (PDF with cover page)</td>
<td></td>
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<tr>
<td>Sep 30 (Sun)</td>
<td>Get approval from SAC and BoT review (30days)</td>
<td></td>
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<td></td>
<td>Presentation at Academy day in Bremen</td>
<td></td>
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<tr>
<td>Nov 2 (Sat)</td>
<td>Approval by BoT (Board of Trustees), submit to publisher</td>
<td></td>
</tr>
<tr>
<td>Dec 21 (Fri)</td>
<td>Publish</td>
<td></td>
</tr>
<tr>
<td>March 25, 2019</td>
<td>Distribute to IAA at Spring meeting in Paris</td>
<td></td>
</tr>
</tbody>
</table>

5. Space Elevator Feasibility Prediction Index

Peter Swan

Co-chair Swan verbally explained current status and he mentioned it should be drafted when all IAA report drafted (by Christmas this year)

6. IAA Report Chapter Five and Six contributor selection

Akira Tsuchida

Chair Tsuchida walked through Drafted Study Report and explained used attachment-1. Contributor candidate who are listed in Attachment-1 are requested to communicate with chair Tsuchida to inform if they can help this effort off line.
7. Next meeting schedule

Next study group meeting will be held during IAA Spring Meeting on March 26, 2017.

8. Others
Appendix- Material for Agenda item #6

Leadership Team (co-chairs, secretary) + several active members (ex. Dr. Yoji Ishikawa, Dr. John Knapman, Mr. Vadym Pasco) needs to focus finalizing this report by end of this year.

There are portions still need to have some help to update in chapter two through four, such as:

1.4.3 Enhancements to the Modern Day Architectures – Dr John Knapman for High Stage one part, Mr. Vadym Pasko for tether climber energy transfer method.

3.3.5 Tether Climber – need to have some specialist who knows space craft design, Mr. Vadym Pasco?

Chapter 4 Technology needs – compare with description (4.3 Technology Needs of the Space Elevator) to match to spider chart (on page 55) and vice versa, Dr Yoji Ishikawa?

1. Structure of Chapter 5 and 6

“Chapter 5 Critical Technologies Risk Identification”
To show any high-risk items to accomplish technologies listed in section 4.3 Technology Needs of the Space Elevator, this section is not limited to focus technology but also including any non-technical issues which prevent advancement of these technologies.

Candidates sections
5.1 Definition of critical technologies with high-risk
5.2 Identified Critical Technology Risk
5.2.1 High-Risk items - Overall Space Elevator
5.2.2 High-Risk items - APEX Anchor
5.2.3 High-Risk items - GEO Node
5.2.4 High-Risk items - Tether Climber
5.2.5 High-Risk items - Tether
5.2.6 High-Risk items - Earth Port
5.2.7 High-Risk items – HQ/POC
5.3 Chapter conclusion
To show risk mitigation plan including showing verification plan and expected schedule

Candidates sections

6.1 Introduction – summary of planned risk mitigation/verification activities

6.2 Detailed plan

6.2.1 Risk Mitigation Plan - Overall Space Elevator
6.2.2 Risk Mitigation Plan - APEX Anchor
6.2.3 Risk Mitigation Plan - GEO Node
6.2.4 Risk Mitigation Plan - Tether Climber
6.2.5 Risk Mitigation Plan - Tether
6.2.6 Risk Mitigation Plan - Earth Port
6.2.7 Risk Mitigation Plan – HQ/POC

6.3 Chapter conclusion
2. Proposal of contributors for chapter 5 and 6 (Chapter 5)

Chapter 5 Critical Technologies Risk Identification

5.1 Definition of critical technologies with high-risk

Akira draft, Pete and Ishikawa to draft review (Akira (-10/15), Ishikawa/Pete (-10/31))

5.2 Identified Critical Technology Risk

Yuto Suzuki (summarize all 5.2.1-5.2.7) (-11/12)

5.2.1 High-Risk items - Overall Space Elevator

Yoshiki Yamagiwa/Akira Tsuchida (The technological and social-scientific R&D of hybrid space elevator,) (-10/31)

5.2.2 High-Risk items - APEX Anchor -1, -2

-1 Kenji Nakashima (Reel-type tether deployment) (-10/31), -2 Pete Swan (Overall Apex anchor perspective) (-10/31)

5.2.3 High-Risk items - GEO Node -1, -2

-1 Yoji Ishikawa (Obayashi/JAMSS’s consideration) (-10/31), -2 Pete Swan (ISEC’s consideration) (-10/31)

5.2.4 High-Risk items - Tether Climber -1, -2, -3, -4

-1 Fumihiro Inoue (Heavy load payload) (-10/31), -2 Vadym Pasko (energy transfer) (-10/31),

-3 Tomohiro kakuta (Thermal) (-10/31), -4 Shun Yokota (Climber motion effect) (-10/31)

5.2.5 High-Risk items - Tether

TBD

5.2.6 High-Risk items - Earth Port

-1 Yoji Ishikawa (Obayashi/JAMSS’s consideration) (-10/31), -2 Pete Swan (ISEC’s consideration) (-10/31)

5.2.7 High-Risk items – HQ/POC

TBD

5.3 Chapter conclusion

Pete Swan (-11/12)
3. Proposal of contributors for chapter 5 and 6 (Chapter 6)

Chapter 6 Proposed Experiments for Risk Reduction and Verification

6.1 Introduction – summary of planned risk mitigation/verification activities

  Akira draft, Pete and Ishikawa to draft review (Akira (-10/15), Ishikawa/Pete (-10/31))

6.2 Detailed plan

  Yuto Suzuki (summarize all 5.2.1-5.2.7) (-11/12)

  6.2.1 Risk Mitigation Plan - Overall Space Elevator

  Yoshiki Yamagiwa/Akira Tsuchida (The technological and social-scientific R&D of hybrid space elevator,) (-10/31)

  6.2.2 Risk Mitigation Plan - APEX Anchor -1, -2

    -1 Kenji Nakashima (Reel-type tether deployment) (-10/31), -2 Pete Swan (Overall Apex anchor perspective) (-10/31)

  6.2.3 Risk Mitigation Plan - GEO Node -1, -2

    -1 Yoji Ishikawa (Obayashi/JAMSS's consideration) (-10/31), -2 Pete Swan (ISEC's consideration) (-10/31)

  6.2.4 Risk Mitigation Plan - Tether Climber -1, -2, -3, -4

    -1 Fumihiro Inoue (Heavy load payload) (-10/31), -2 Vadym Pasko (energy transfer) (-10/31),

    -3 Tomohiro Kakuta (Thermal) (-10/31), -4 Shun Yokota (Climber motion effect) (-10/31)

  6.2.5 Risk Mitigation Plan - Tether

    Pete and Mark Haase

  6.2.6 Risk Mitigation Plan - Earth Port

    -1 Yoji Ishikawa (Obayashi/JAMSS's consideration) (-10/31), -2 Pete Swan (ISEC's consideration) (-10/31)

  6.2.7 Risk Mitigation Plan – HQ/POC

    TBD

6.3 Chapter conclusion

  Pete Swan (-11/12)
4. Due for contributor’s input and sample

(1) Due: Oct 31

(2) Number of pages: approximately 3 pages

(3) Example sample structure to input to SG3.24 leadership team:

   (Example of Yoji Ishikawa’s “5.2.3 High-Risk items - GEO Node” and “6.2.3 Risk Mitigation Plan - GEO Node”)

<table>
<thead>
<tr>
<th>Contributor’s Input for 5.2.3 and 6.2.3</th>
<th>Oct 31, 2017 Yoji Ishikawa</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.2.3 High-Risk items - GEO Node</td>
<td></td>
</tr>
<tr>
<td>Summarize your IAC2017 Paper to focus High Risk item to accomplish Space Elevator GEO Node</td>
<td></td>
</tr>
<tr>
<td>(Ref) your IAC paper 2017</td>
<td></td>
</tr>
<tr>
<td>6.2.3 Risk Mitigation Plan - GEO Node</td>
<td></td>
</tr>
<tr>
<td>Summarize your IAC2017 Paper to focus Risk Mitigation Plan to accomplish Space Elevator GEO Node</td>
<td></td>
</tr>
<tr>
<td>(Ref) your IAC paper 2017</td>
<td></td>
</tr>
</tbody>
</table>

Total pages are recommended less than 3 pages.
(You may have some early Sample by Akira or Dr. Ishikawa soon…)

Contact Information:
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Dr. Hatsumi Ishida ishida.hatsumi@jamss.co.jp (Back up) Mr. Yuto Suzuki suzuki.yuto@jamss.co.jp
Appendix 2: List of Attendees

<table>
<thead>
<tr>
<th>Name</th>
<th>E-mail</th>
<th>Country</th>
<th>Affiliation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peter Swan</td>
<td>drswan@corotec</td>
<td></td>
<td>International Space Elevator Corp.</td>
</tr>
<tr>
<td>Roger Lener</td>
<td></td>
<td></td>
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<td></td>
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<td></td>
<td>Shonan Institute of Technology</td>
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<td></td>
<td>Shisekata University</td>
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<td>Minoru Sato</td>
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<td></td>
<td>Tokai University</td>
</tr>
<tr>
<td>Yoji Ishikawa</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Avin Mithra</td>
<td></td>
<td></td>
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</tbody>
</table>

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