



Minutes of Meeting 4 Oct 2012
Assessment of the Technological Feasibility and
Challenges of the Space Elevator Concept [IAA 3-13]

15 October 2012

1 – Summary: The discussion focused on the objective of having all chapters completed by the 20th of December 2012. It is the consensus that the drafts of all chapters can be accomplished by then.

2 – Attendees: Peter Swan [co-editor], Skip Penny [co-editor], Akira Tsuchida, Sunao Kai, John Knapman, Roger Lenard, Giuseppe Reibaldi, Art Dula, Jerome Pearson, Bruce Pittman.

3 – Agenda: The agenda followed the objectives of the meeting and was simple:

- Gather Authors after draft – draft of all chapters
- Present major points to ensure consistency across chapters
- Discuss any resulting conflicts of ideas or approaches
- Lay out approach for smooth flowing Study Report

4 – Schedule: The study seems to be slightly behind schedule; however, effort is being focused to complete the study and address the items that are behind. Here is the current schedule agreed upon by the authors:

25 August	Workshop in Seattle [1/2 day] [completed & very helpful]
20 Aug	Chapters completed in draft-draft form
5 Sept	Comments returned to chapter captains
15 Sept	Papers due for IAF session [being submitted now]
4 October	Paper presentations in Naples [Hall 2 1300 hrs]
4 October	Final Cosmic Study mtg in Naples [Hall 2 1300 hrs]
20 Dec	Final Chapters in draft to editors
1 Feb 2013	Final Cosmic Study to Commission III review
15 Mar	Comments incorporated in Final Cosmic Study version
15 Apr	to Peer Review Panel
1 July	comments incorporated into final publishable version
15 July	to SAC and BoT
15 Aug	to publishers

5 – Table of Contents: see below TOC, which has not changed since March.

6 – Discussions:

Roadmaps – The first large discussion focused upon the preliminary roadmaps laid out for chapter 11. The idea that surfaced was that there should be two possible roadmaps for the study report. The first would reflect a relatively soon breakthrough in Carbon Nano-tube specific strength numbers, and then a second roadmap that would reflect a later timeframe for material development. As no one can predict breakthroughs



in technology, the idea is that the study report team could “bracket” the potential material strength achievements and show two timeframes for space elevator operations start.

Way Forward – A new idea surfaced that focused upon the need to show a “way forward” for the technology developments across the infrastructure. The concept is that the space elevator infrastructure development team could sponsor parallel prototype development projects to lower risk and refine the technologies. The idea would be to put these parallel prototype projects into chapter 10 and end up with Technology Assessment and The Way Forward as a common set of projects leading to a start of the Space Elevator Infrastructure Development Program Office. The major topics to be placed in parallel prototype development are:

- Carbon Nano-tube Specific Strength Demonstrations:
- Initial Deployment Spacecraft
- Tether Climber Design:
- Marine Stage One Prototype:
- High Stage One Prototype:
- Dynamics and Deployment Simulations:
- Flight Prototype Demonstration [in orbit]:

Return on Investment: The feedback is the RoI should be less than 10 years.

Involve Obayashi corporation: It was suggested that the newly initiated contract from JAXA to the Obayashi corporation should be leveraged to result in a solid look at the Marine Node.

Individual chapter reviews: Each chapter chair that was present summarized where they were at and how much progress was required.

Skip Penny reported on Chapters 8 & 9

Akira Tsuchida reported on roadmaps for Chapter 11

Professor Kai reported on Chapter 12

John Knapman summarized Chapter 5

Pete Swan summarized Chapters 1, 2, 4, 7 & 13/14.

7 – Summary: All of us are working towards 20 December.

Peter Swan, Ph. D.

Cosmic Study lead Editor



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A Cosmic Study for the International Academy of Astronautics

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Acknowledgments

Executive Summary

Part I - Introductory

1. Introduction
2. Systems Infrastructure View

Part II - Major Elements

3. Tether Material
4. Tether Climbers
5. End Station Infrastructure (Base & Apex Anchor)

Part III - Systems Approach

6. Dynamics & Deployment
7. Systems Design for Environment
8. Systems Design for Space Debris
9. Operations Concept
10. Summary of Technological Assessment

Part IV - Architectural and Policy Considerations

11. Developmental Roadmaps
12. Legal and Regulatory Frameworks
13. Market Projections
14. Financial Perspective

Part V - Findings, Recommendations and Conclusions

15. Study Findings
16. Recommendations for the International Community
17. Next steps & Concluding Remarks

Appendices

- A. Glossary of Acronyms
- B. IAA Study Participants (*including names, titles, affiliations, countries*)
- C. Study Terms of Reference
- D. List of Peer Reviewers
- E. Space Elevator History
- F. List of Sources about the Space Elevator (*including separate headings for books, articles, websites, conferences, prizes, organizations etc*)
- G. Technical appendices
- G-1. Definition of MYuri
- G-2. Summary of Space Tethers
- G-3.