Contents of IDR Accelerator Section

J. Scott Berg Brookhaven National Laboratory IDS-NF Plenary Meeting 25 September 2010



Overall Layout

- Introductory chapter
- Sections for individual subsystems
- Conclusions and future plans
- Appendices







Introductory Chapter

High-level version of baseline
 Itemization of progress since ISS
 Summary of key issues





Sections for Individual Subsystems



- Detailed lattice descriptions
- Component list and counts
- Details on key components, significant updates
- Risks/problems/challenges and mitigation ideas
- O Hardware R&D needed
- Tasks for RDR
- Around 10 pages per subsystem







Conclusions and Future Plans

- Summarize what we have achieved
- Key issues we need to address
- Recapitulation of hardware program
- Milestones and timeline to RDR







Appendices

- Site specific proton driver designs
- Alternatives for risk mitigation and cost reduction
- O 2 pages per subsystem (except proton driver)







Individual Subsystems

- OProton driver
- Target
- Front end
- Lower energy acceleration (linac/RLA)
- Final acceleration stage (FFAG)
- Decay ring
- What follows: differences specific to each subsystem







Complete Accelerator Facility









Proton Driver

- Summary of baseline requirements
- Each site: design based on existing infrastructure
 - In individual appendices, since they are site specific







- Experimental demonstration of Hg jet suitability
- Target optimization results
- Important subsystems
 - Hg delivery system
 - Collection pool and beam dump
 - Capture solenoids: head load, cooling, and forces
 - Shielding and containment





Target



Problems with existing system
 Energy deposition in SC solenoids
 Forces on magnets

Describe approaches for solving these problems





Front End

 Reduced RF gradient in magnet field Experimental results and program Consequences of reduced gradient Risk-mitigating alternatives Oetailed description in appendix
 Energy deposition from particles Calculations showing the problem Ideas for mitigation





Early Acceleration Stages Linac and RLAs



- Magnet model for solenoids, field maps
- ORF cavity design
- Error sensitivity
- Initial simulation work
- Alternatives in appendix
 - FFAG arcs (eliminate switchyard)
 Scaling FFAG for second stage (more turns)



Final Acceleration FFAG



Injection/extraction system design
 Magnet designs

 Main ring magnets
 Kickers and their power supplies
 Plan for kicker test
 Septa

Discussion of chromaticity correction







Decay Ring

Diagnostics

- □ Absolute current to 0.1%
- Energy/polarization measurement
 - Simulation of device
 - Description, placement, etc.

 Divergence measurement: describe options, (dis-)advantages



Heutrino Factor

Timeline

- Individual sections by end of October
- Accelerator boilerplate by mid-November
- Merge into full document by end November
- Ready to hack away for writing workshop 6–10
 December



