

SUMMARY OF WORKING GROUP DISCUSSION ON ACCELERATORS

Chair: P.K. Sigg

Discussion

Suggestions (Y.L. Cho) on chosen topics – availability, reliability, high intensity and efficiency:

- Define *observation period*; Suggestion (A. Mueller): For three months of operation, followed by one month shutdown period (maintenance, restocking).
 - Comment (T. Mukaiyama): For future industrial applications (burners), observation period should be greater than one year!

Beam trips: Neglect events < 1 sec. → **goal: only five trips/month, > 1 sec.!**

- Comment (R. Sheffield): Trip of > 10 sec. → reactor will shut down!

Reliability culture: Suggestion is to **go to industrial standards** (e.g. aerospace industry).

- Comment (P. Schmelzbach): There is a trade-off between system complexity and redundancy!
- Definition (P. Pierini): Differentiate component vs. system reliability; this should be clearly identified in specs.
- Comment: Recording (data logging) is not sufficient → (H. Ait Abderrahim, A. Mueller) interpretation is essential, affects the quality of the available database.

Suggestion: Agree upon/introduce common standards or guidelines! (But WHO will do that?)

- Comment: Safety increases reliability (!?)
- Comment (R. Sheffield): Diagnostics can be failure cause – false alarms can be frequent (see P. Schmelzbach).
- Comment (several speakers): Aside from well known “trouble areas” (vacuum, RF systems), many interruptions are caused by support system failures (power grid, cooling systems, etc.), and are not directly influenced by accelerator design).
- Observation: Many machines are “experimental”, that is to say, prototypes (one of a kind), so reliability is not the same as in industrial plants (including reactors).
- Comment (D. Vandeplassche): Commercial cyclotrons (e.g. for medical applications) are “finished” at one time → *no more tinkering!*

Energy efficiency; Question (T. Mukaiyama): Can anyone give a number for overall electrical efficiency?

- Discussion: You can expect a maximum of ~50% (based on several opinions – R. Sheffield, A. Mueller...)
- Comment (R. Sheffield): There exists a trade-off between availability and efficiency → redundancy (like hot spares) is detrimental to energy efficiency!

Question (L. Ponomarev): What amount of beam power is desired for ADS? Or, how much power can reactors reasonably take? (The question has been asked before.)

Answer (H. Ait Abderrahim, A. Mueller, others): 10-20 MW is sufficient!

Non-technical issues

Funding: What can be done to increase funding for ADS? On the accelerator side (A. Mueller), accelerator community seems to get short changed. Suggestion: Widen the spectrum of applications offered for accelerator development!

Manpower: There seems to be a shortage of qualified, experienced accelerator scientists. Question: What can be done to alleviate the problem in view of the increasing demand for new/existing projects?

Suggestions: More aggressive advertising in universities, career planning, etc. More effort is needed!

Conclusion

Questions yet to be resolved (T. Mukaiyama): After having worked out solutions to some of the key questions (such as: what accelerator type is “best” → try SC linac; what are the costs → first estimates available for prototype machines; what is the energy consumption → see above discussion on energy efficiency), there are still a few open questions. At present, trying to answer them is only guesswork. Typically, questions such as “When will what accelerator be fully operational?” and “When will the trip rate reach the desired value?” are still waiting to be answered in the future. The prototypes now under construction will help us in providing answers to these questions and many smaller issues.

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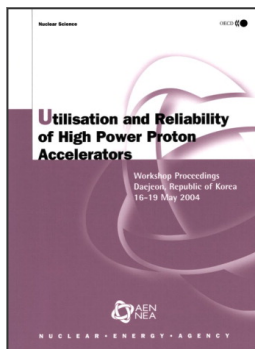
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From:

Utilisation and Reliability of High Power Proton Accelerators

Workshop Proceedings, Daejeon, Republic of Korea, 16-19 May 2004

Access the complete publication at:

<https://doi.org/10.1787/9789264013810-en>

Please cite this chapter as:

OECD/Nuclear Energy Agency (2006), "Summary of Working Group Discussion on Accelerators", in *Utilisation and Reliability of High Power Proton Accelerators: Workshop Proceedings, Daejeon, Republic of Korea, 16-19 May 2004*, OECD Publishing, Paris.

DOI: <https://doi.org/10.1787/9789264013810-61-en>

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