Availability metrics session

Andrea Apollonio

Enric Bargallo

Availability metrics - Scope

- Do you have (now or in the future) the need of other facilities sharing their availability data?
    - *Yes, **all representatives of the machines expressed their interest** in this data.*
    - *The main interest on this data is to **identify areas of improvement** based on experience in other facilities.*
    - *Another interest is on **reliability modeling** of systems*
- Would users decide to go to one or another facility depending on these statistics?
    - *They already base their choice on information they get on the facilities*
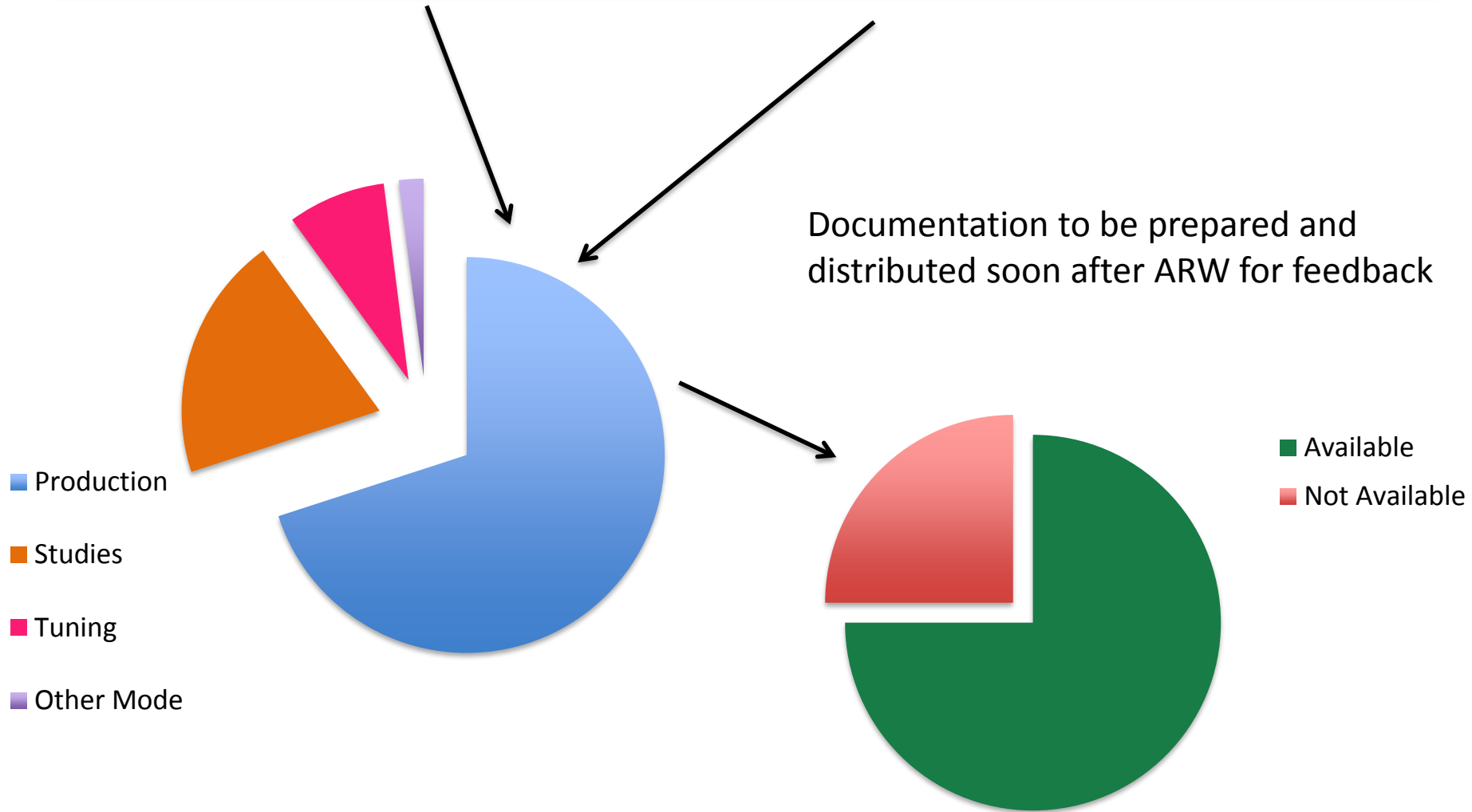
Can metrics of different types of facilities be compared?

- Yes, with **proper definitions**

- Criterion for comparable availability ("beam availability"):
  - Light sources: beam in the ring
  - Circular colliders: beam in the ring
  - Spallation sources: beam to target
  - Medical accelerators: beam to patient
- Facility-specific availability:
  - Light sources: beam to users
  - Circular colliders: delivered luminosity
  - Spallation sources: beam to users
  - Medical accelerators:

Availability metrics – what information we should share?

- Data identified as useful to share:
  - Availability
  - Downtime
  - MTBF
  - MTTR

- Relevant information to understand the context for data provided:
  - Operation schedule (production/studies)
  - Operating conditions (thresholds for beam availability, beam intensity, energy,…)
  - Other (e.g. upgrades/maintenance actions)

- What type of information would you like to receive from other facilities?
  - System level statistics to identify areas for improvements
  - Component level for reliability modeling

First ideas (I)

Tuning	Production	Studies	Production	Other

Documentation to be prepared and distributed soon after ARW for feedback

- Production
- Studies
- Tuning
- Other Mode

- Available
- Not Available

First ideas (II)

- Standard definition of accelerator breakdown structure for availability statistics:
    - Controls
    - RF system
    - Electric power
    - Cryogenics
    - …

ARIES Project

- Scope: gather and store reliability data (see slide 4) for accelerator systems and components into a common information systems

- Austrian Institute of Technology is developing a standardized accelerator breakdown structure → Will be distributed for feedback in the next months to be finalized before next ARW

Conclusions and next steps

- A lot of interest in the community to share information

- A proposal on a common format for availability statistics (based on the discussions during ARW) will be developed and distributed soon for feedback

- Plan for next ARW:
  - Facilities will present statistics according to a defined template
  - Start keeping records of statistics in ARW proceedings (some facilities might not be willing to share this information)

- ARIES project can help and support these activities

Extra slides

Format to share the information (I)

- Define a standard data that can be provided by each facility in operation:
  - Description of the function under consideration (beam to users, collisions, etc.)
  - Number of hours scheduled for the main function ($T_{scheduled}$)
  - Number of hours in $T_{scheduled}$ that this function was not properly working (T_{down})
  - Availability calculation as: $A = (T_{scheduled} - T_{down})/T_{scheduled}$