EUROPEAN SPALLATION SOURCE

Safety

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Outline

- Role and mandate of safety group
- Radiation safety:
  - Shielding coordination
  - Coordination and collection of documentation related to SSM licensing process
  - Air management system
  - Fire safety
- Non-radiation safety:
  - Cryogenic safety
- Safety manual
- Summary

Role and mandate of safety group

- As of October 2nd, a new AD organization will become functional.
- Safety group will become one of the six groups in the division and will have three FTEs. Additional short-term support will be used from within or outside ESS.
- Role and mandate for the group will be finalized and confirmed shortly, however, the main mission of the group will be to support the accelerator division in the implementation and enforcement of ESS's Safety Policy.

Radiation safety – shielding coordination

- At the moment the support related to radiation shielding assessment for the ESS linac lies in the safety group.
- AD safety group is continuously getting requests to assess shielding adequacy in specific areas.
- ESS shielding procedure is followed.
- Methods used:
  - Analytical approach to make first judgment of proposed shielding configuration change.
  - MC calculations to verify that the proposed shielding modification is not jeopardizing the overall shielding properties.
- Majority of the above is to support CF (conventional facilities) and ES&H (environment safety and health) divisions in design and construction and licensing process for installation and initial commissioning with the radiation safety authority (SSM).

Monte-Carlo tools used to address radiation questions

- News:
  - A world class expert, Igor Tropin from Fermi-lab is visiting AD for four weeks to update a model/describe it in a root based geometry description file. This geometry description can be used in various MC codes. The model will be a living model, that will be updated every once in a while in a controlled way.
  - Input is necessary from all WP-s.
  - New task force for shielding verification.
  - We are looking for a MC calculations expert in the Safety Group.

Licensing process with SSM

- ES&H division is leading the entire process.
- Description of the application #2, covering installation and initial commissioning of the accelerator [ESS-0034327] was submitted to SSM for a feedback. Feedback is expected in the beginning of October.
- The application is to be delivered to SSM in April/May 2016.
- Some of main topics where input is required from all work packages and in-kind partners (TBD individually with WPs):
  - Description of functions and performance of individual systems and components, including engineering drawings.
  - Description of material composition of components in systems and their masses.
  - Risk analysis for various accelerator systems and support systems.
  - A description of expected replacement and maintenance needs for equipment.

Radiation safety – other

- At the moment the support related to the assessment of the design of the systems that have a safety function (related to radiation safety, e.g. HVAC system, fire suppression system) for systems involving ESS linac lies in the safety group.

- Majority of the above is to support CF (conventional facilities) and ES&H (environment safety and health) divisions in design and construction and licensing process for installation and initial commissioning with the radiation safety authority (SSM).

Air management system

- CF is owner and responsible for design of HVAC systems.
- AD safety group provides support related to the assessment of the design of the systems.
- Preliminary HVAC risk analysis & action matrix provided by AD safety group (Duy P.).
- Derived air concentration (DAC) calculations were provided by Daniela E. in ES&H division.

Fire safety

- Decision on CCB, week 34: there will be a fire suppression system in the tunnel. The smoke evacuation is removed.

- CF is owner and responsible for the design of fire suppression system in the accelerator tunnel.
- AD safety group provides support related to the assessment of the design of the systems.
- Several options are discussed between CF, ES&H and AD.

Non-radiation safety

- At the moment the support related to the assessment of the design of the systems that have a safety function (related to non-radiation safety) for systems involving ESS linac lies in the safety group.

- This is to support AD work packages and designers in their design work.

Cryogenic safety

- AD/relevant WPs own and are responsible for this.
- AD safety group is supporting in:
- Safety process and implementation.
- CFD calculations (Emil L. (EIS division) 30%):
  - Define the boundary conditions necessary for the CFD simulation, such as:
    - Hazardous scenarios: leak, abrupt rupture, discharge from safety device, etc.
    - Description of cryomodules and cryogenic circuits, also tunnel dimensions and HVAC system.
- ODH working group:
  - Collect missing information for ODH studies
  - Discuss the failure scenarios chosen for the on-going ODH assessments
  - Tailor the ODH safety process & strategy to ESS' needs
  - Discuss the implementation of control measures such as ventilation, training, etc.

Safety Manual

- ES&H division is regularly asked by AD to provide a safety manual.

- ES&H division is currently investigating options and ways to deal with this to prepare a comprehensive safety manual in a timely manner.

Summary

- We plan to continue working in cooperation with various ESS divisions and accelerator work packages in order to achieve high safety standards.
- In order to be efficient, clear communications have to be established and followed. AD safety group's role and mandate has to be clearly formulated and expectations need to be realistically managed based on the available man-power and amount of estimated work.
- MC calculations field has to be strengthened by providing additional resources.

Thank you!