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Brief summary of the highlights of sessions 1-12

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- Bo Lindell –books in English:
  - The first book ‘Pandora’s Box’ available in English both free of charge in pdf
  - The books 2-4 will be available in the autumn 2019
  - The books can also be bought from Amazon

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- Learning from the past is a key issue in the development of new recommendations.
- When revising safety fundamentals, a new version has to be developed slowly and right, not fast! Simplification, clarification and to make the system more understandable are in focus.
- Research cooperation platforms are important arenas for development of scientific basis for radiation and nuclear safety. National, Nordic, European projects are needed.

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- There is a need to perform a survey in the Nordic countries regarding current situation on education and research and on future needs.
  - The need for provide an mechanism to collect ideas for common research and joint research projects.
  - Work on methods to attract young people.
- Radioecology: Only a handful of projects related to nuclear fission facilities

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- Radiation protection should always be considered while choosing medical technologies and methods. This should be part of justification process.
- To establish DRLs for paediatric examinations, cooperation between small countries is beneficial to gather sufficient amount of data using recommended techniques.
- In cardiology patient skin dose alerts should be set using KAP and patient dose reports should be audited.
- Defining significant and non significant events, which events should be reported to the authority and when, seems to be a major challenge.

- The rapid development of technology: radiological equipment, AI (artificial intelligence), ... calls for active collaboration between the authority, users and their professional societies and industry to get all the benefit available.
- Examples of new methods: calculation of staff doses bases on motion tracking and Monte Carlo simulations, NaCl pellets as prospective dosimeters, detectors for medical imaging with spectral resolution, radiation detection with mobile phones, use of statistical methods to supplement conservative methods.

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- There is a possible link between induced genomic instability and ELF magnetic fields.
- The legislation for NIR devices and their usage in the beauty care is not harmonized in Europe.
- The Icelandic sunbed survey results showed a clear decrease in the number of sunbeds and in their use from 2004 to 2018. The survey results help to be target campaigns to further decrease of sunbed use and for studies on the incidence of melanoma
- Tanning might be addictive through endorphin formation on skin.

- Embedding the ALARA concept into the safety culture from the beginning of new nuclear building project allows effective reduction of staff doses and environmental releases.
- Determining isodose lines and using these in prioritization could allow more effective decontamination strategies.
- Estimation of the releases in decomissioning is important especially during the planning phase, but should be validated with measurements and environmental samples.
- Regulators must also consider their positions so as not to issue over-conservative demands.

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- Early warning networks and trained personnel are a crucial part of preparedness for threats including modern spectrometric stations and state of art computer programmers.
- The existing national preparedness organizations benefit also from voluntary trained radiation protection experts.
- For emergency exposure situations emergency workers can be classified.
- Also new dispersion and dose calculation results are developed for hypothetical release scenarios.

- For the dose to the lens of the worker's eye, dose measured at the collar level can be used as the basis for a first dose estimation and for the assessment of the need for further radiation protection measures, e.g. increased shielding or more detailed measurements.
- The results from Sweden have indicated that nuclear facilities need to continue to monitor workers, especially itinerant workers. It is important to continue to identify risk tasks in the facilities, assign dosimeters to the right individuals and make sure workers wear the dosimeters in a correct manner.

- In relation to communication it is important to combine holistic view, involvement of target groups in an empatic way. Graded approach.
- More efficient and productive inspections are made when safety, security and safeguards inspections are combined when inspecting users of nuclear materials.
- Implementation of the EU-BSSD has enhanced to use graded approach in radiation protection e.g. In Finland the categorizations of exposures and sources is used as a tool for that.