Implementing 3S in Practice

Conducting the 3S inspections

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Objective and background (nuclear materials)

- Use of nuclear energy shall be safe and shall not promote the proliferation of nuclear weapons
  - STUK maintains national safeguards system necessary for non-proliferation
- In use of nuclear energy, safe use of nuclear materials must be ensured
- Nuclear materials are uranium, thorium and plutonium… these are also radioactive materials
- In some occasions, use of nuclear energy and use of radiation is mixed
  - Nuclear materials can be used as radiation shieldings for radiation sources
  - Nuclear materials can also be used in other radiations practices, e.g. fission chambers (high enriched uranium) in measuring devices in medical equipment

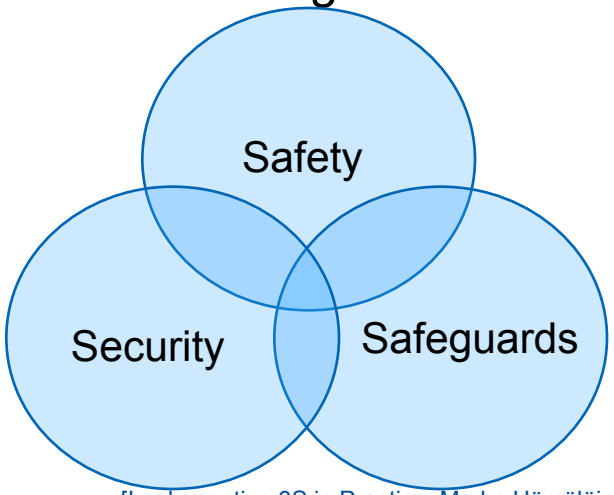
  → **Both nuclear and radiation legislations applies to most medium and small users**

Basis

- Safety is always primary
  - Use of radioactive materials and nuclear materials must be safe
- Security and adequate physical protection is must
  - The required level of security results from the anticipated danger and consequences of malicious acts
    - Both nuclear and other radioactive materials shall be appropriately protected
- Safeguards is prerequisite when using nuclear materials
  - Accounting and bookkeeping of nuclear materials is required to fulfil international obligations

Same principles, same procedures, same practices

Combination of Safety, Security and Safeguards together are 3S



[Implementing 3S in Practice, Marko Hämäläinen]

Synergies

- License/notification in accordance with Nuclear Energy Act for use of nuclear materials
- License in accordance with Radiation Protection Act for use of radioactive materials

- Safety, security and safeguards requirements shall be fulfilled, these includes
    - Responsible persons are nominated and approved
    - Safe use of nuclear and radioactive materials shall be ensured
    - Security and physical protection of materials and activities shall be arranged
    - Safeguards, including nuclear materials accountancy and control, shall be arranged

→ Operation can start after all required licenses are granted and readiness to start activities are inspected and approved

Nuclear Material holder – 3 S inspection at VTT

- VTT Centre of Nuclear Safety has
  - Licence for use of nuclear energy (nuclear materials), granted by the Nuclear Waste Regulation and Safeguards
  - License for use of radiation (radioactive materials), granted by the Radiation Practices Regulation
  - Approved responsible managers in accordance with licenses
  - Nuclear Materials Manual approved by the Safeguards section
  - Security arrangements both for use of radiation and radioactive materials and use of nuclear energy and nuclear materials (COMBINED – one operator, same physical protection measures for both)


Photo by VTT

- To ensure that all requirements are fulfilled and functions are implemented appropriately, STUK to perform an inspection before ANY operation can be started
  - Three different departments of STUK to be present: radiation safety in industry section, safeguards section and nuclear security section

Nuclear Material holder – 3 S inspection at VTT (cont.)

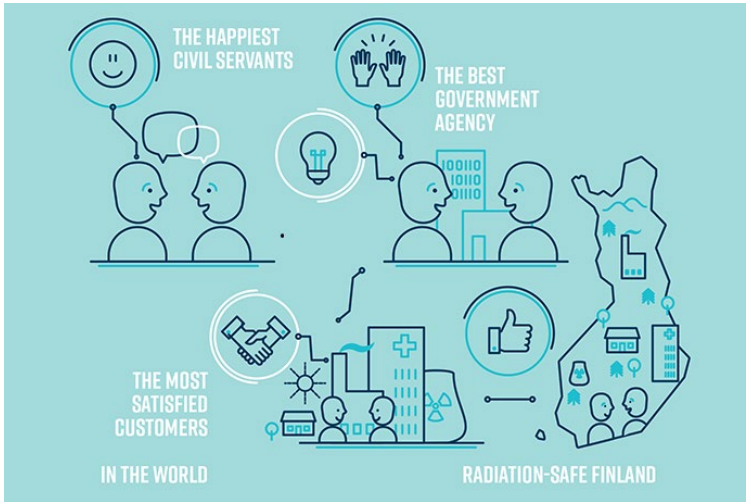
- VTT were represented by the
  - Responsible managers and persons taking care of safeguards and security measures
  - Person who lead the construction and commissioning projects

Result:

- STUK could ensure itself that safety, security and safeguards is adequately and appropriately taken care in VTT Centre of Nuclear Safety

Outcome:

- Operator understood the basis,
  the relationship and the tasks of each regimes
  → creating better assurance that all aspects and
  requirements are properly implemented



Vision, STUK's strategy

Small Nuclear Material holders – 3 S inspection

- Can be small or big in radiation protection scale
- Has radiation practices license
- No nuclear material license required (normally)
  - If only depleted uranium as shielding, basic requirements are applied
  - If e.g. high enriched uranium (e.g. fission chambers),
    licence with basic requirements are applied

- Safety, security and safeguards requirements shall be fulfilled
- 3 S inspection:
  - Radiation protection expert during his periodical inspection checks also the physical inventory of nuclear materials
  - Randomly, but seldom, this inspection can be performed with safeguards and/or experts

Conclusions and future tasks

- Advantages
  - 3S inspections are enhancing common understanding of all three S's, their functions and requirements – both by the regulatory authority and operator
  - Use of resources of authority can be optimised and centralised
    - One inspection three functions instead of two or three separate inspections
    - Authority acts and shows as a one complete entity
  - Operators do not need to prepare to many inspections
    - Confusion with requirements for the radioactive and nuclear materials can be avoided
    - Better understanding of big picture – there is no "additional burden"
- Future tasks
  - Simplifying the licensing procedures
    - Nuclear material licences, safety and security could be taken care in radiation practice license
  - Create common internet based portal for reporting for both regimes (safety, safeguards)
  - Internet based license applications for nuclear materials