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
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)

• 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
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