Surveys of development needs for licensing model of nuclear installations in Finland

Main results and recommendations

Rauno Rintamaa
Karri Rintamaa
Clenercon Oy

Kari Törrönen
EnergyWave Oy

Nuclear Science and Technology Symposium (SYP2019)
30-31.11.2019

Contents

- Background and motivation for the surveys.
- Evaluation of power companies´ and other stakeholders' needs and challenges – survey 2017.
- Evaluation of technology companies' needs and challenges in the supply chain - survey 2018.
- How to proceed – Outline proposal for next steps.

Background and motivation for the surveys

- Licensing of nuclear installations has become very complicated and difficult process to manage. Within EU many stakeholders have proposed clarification and harmonisation of the licensing process.
- In autumn 2017 and 2018 two surveys, funded by the Radiation and Nuclear Safety Authority of Finland (STUK) were carried out using interviews.
- In the survey, autumn 2017, the major emphasis was to evaluate the Finnish stakeholders´ (mainly power companies) opinions and development needs about the national licensing issues.
- In the survey, autumn 2018, the emphasis was to gather feedback from the main actors of technology industry in Finland and to compare regulatory practices in various safety critical technology areas.
- The main goal for the surveys was to increase the overall safety of nuclear installations through improving licensing process and procedures as an essential part of the STUK strategy for years 2018-2022.

Evaluation of stakeholders´ needs and challenges – survey 2017

Aim

- The major part of the survey was interviews of stakeholders´ representatives.

Execution

- High level persons in total of 22 were interviewed representing 14 different organisations including all major utilities and waste handling organisations, industrial associations, ministries and safety authorities as well as independent experts.
- After each interview, a summary was prepared for approval of the interviewee.

Content of the interviews included five different areas

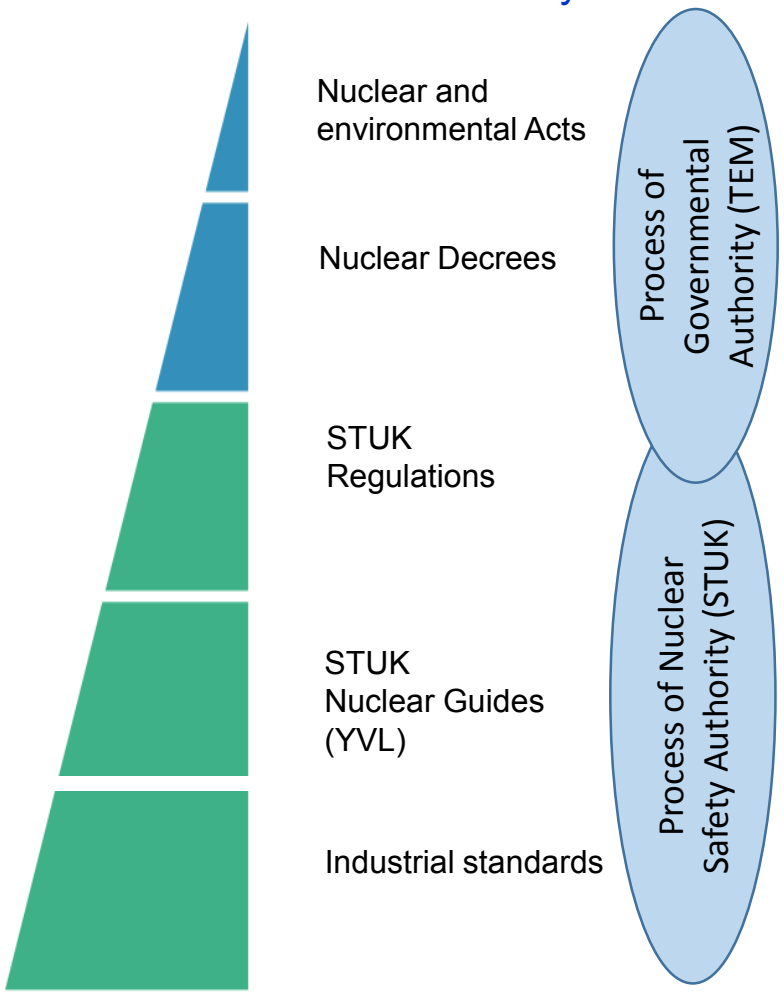
- Stakeholders' views of the current status of licensing model and related processes
- Main challenges/problem areas in licensing
- Main development areas and proposals for licensing development
- Proposals for development process models and funding
- Other important issues

Summary and the priorized development areas for the proposed future work

- In general, the current national licensing model was found good, however four main development areas were identified:
- Updating the current licensing architecture and hierarchy:
  - Identification of needs for the changes of the licensing achitecture and hierachy, and
  - Their affects to the safety requirements and operational processes of licensing approach as well as to the infrastructure and operational processes between different operators in the supply chain
- Application of Graded Approach in evaluation of safety elements, in fullfilling the safety requirements and in utilisation of fit for purpose -concept as well as in quality system development, e.g conformity assessment of safety class 3 SSCs.
- Identification and evaluation of possible hierarchy levels and licensing areas, which could be harmonised at EU-level.
- Development of licensing model and procedures for Small Modular Reactors (SMR).

Licensing architecture and hierarchy
Life cycle model

Present licensing architecture and hierarcy

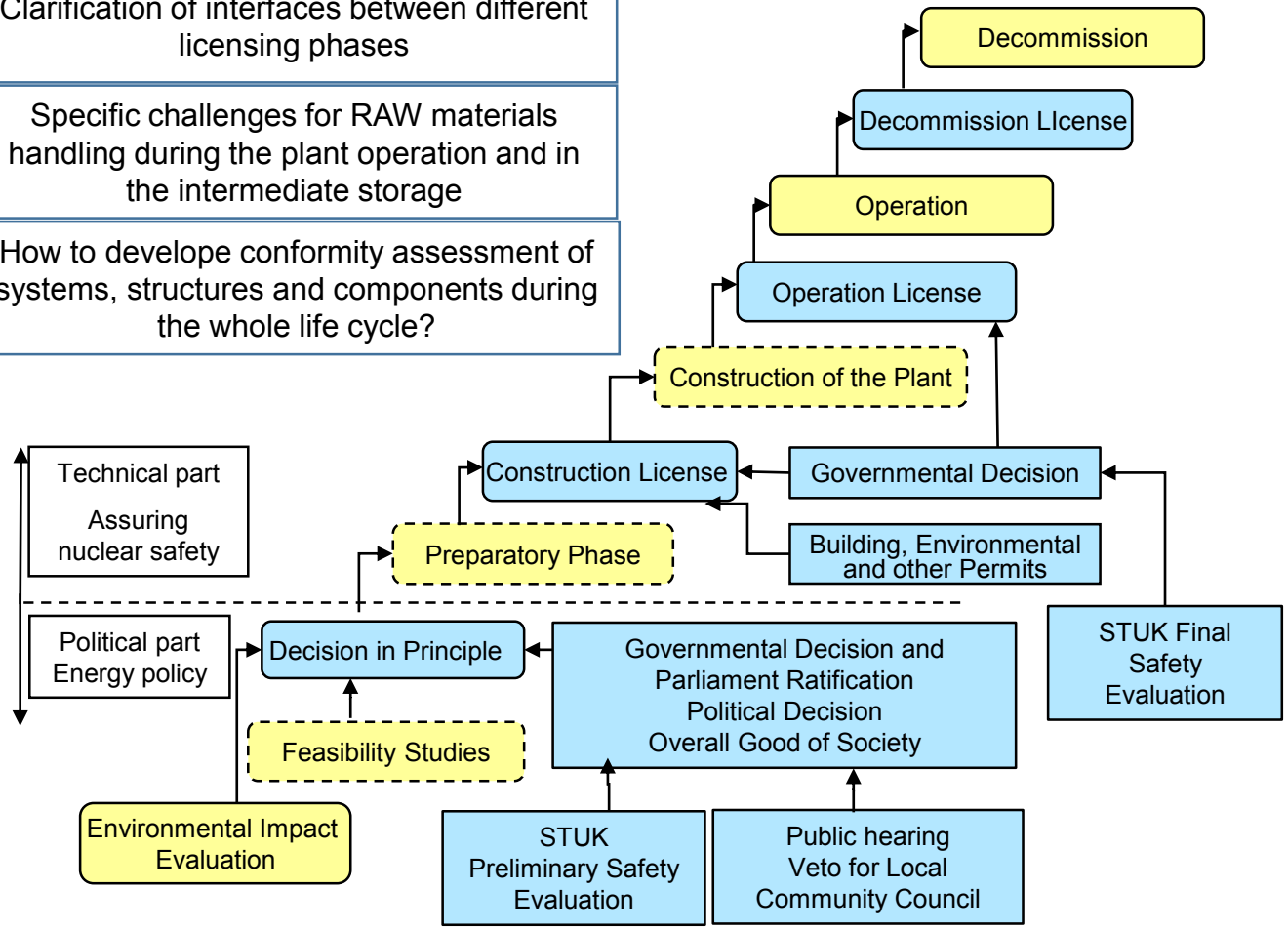


Identified development areas based on the survey

Clarification of interfaces between different licensing phases

Specific challenges for RAW materials handling during the plant operation and in the intermediate storage

How to develope conformity assessment of systems, structures and components during the whole life cycle?



Evaluation of technology companies´ needs and challenges in the supply chain survey 2018

Aim

- The aim of the survey was to gather detailed feedback from the main actors of technology industry in Finland and to compare regulatory practices in various safety critical technology areas for mapping development needs and problem areas in licensing.

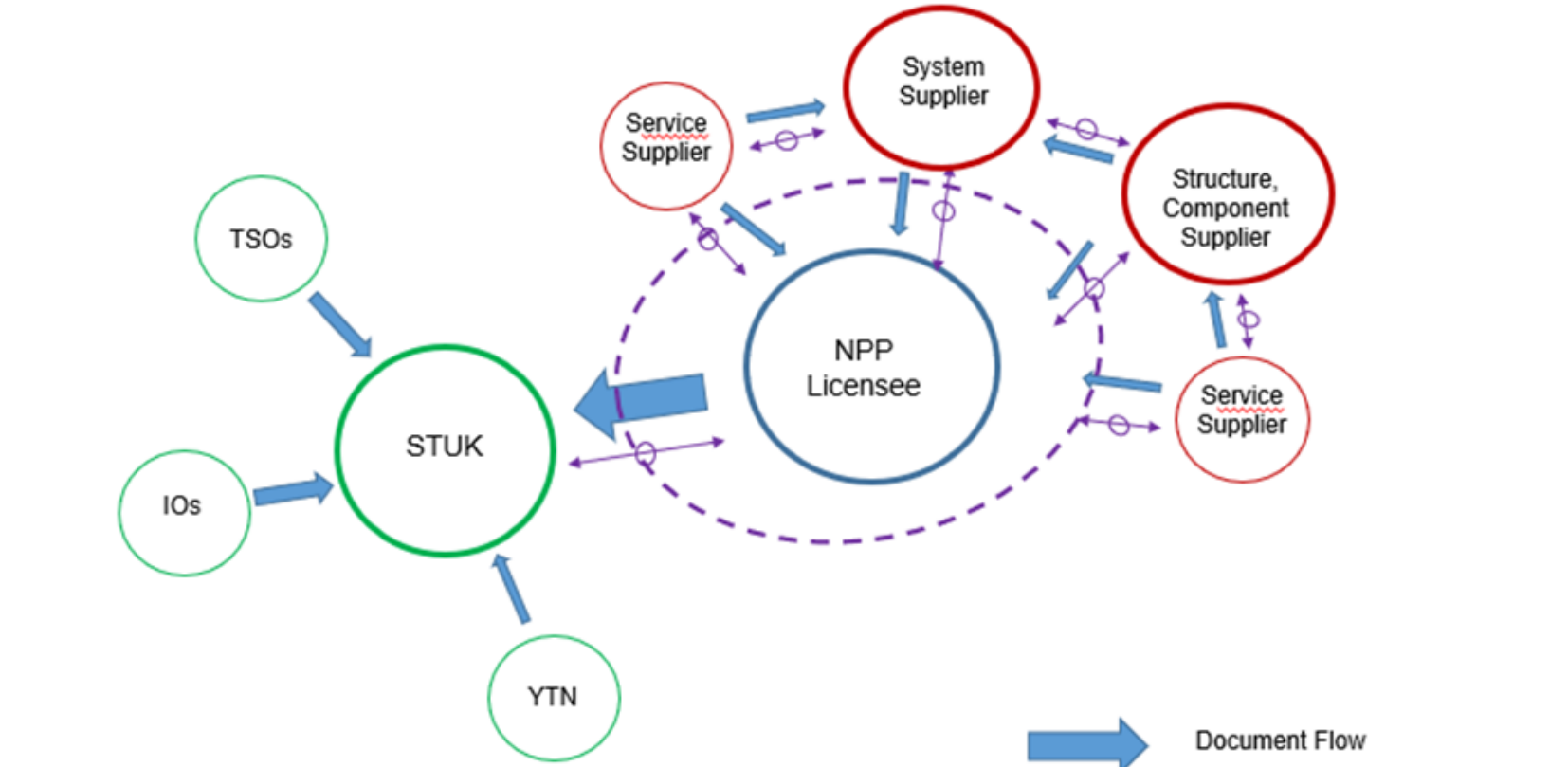
Execution

- Twelve technology companies were selected to represent wide product and service portfolio.They were grouped in two categories:
  a) Companies representing designing and manufacturing of systems, structures and components or
  b) Companies representing designing, consulting and other services of systems, structures and components.
- Persons selected for interviews were responsible for technical and commercial activities in nuclear area in their respective companies.

Content of the interviews included five different areas:

- Company's product and service activities and its role in supply chain
- Functionality of nuclear regulation and procedures
- Main challenges in utilisation of regulation and procedures
- Main improvement targets and expectations for different actors
- Proposals how to organise further development of regulation and procedures

Role of companies in the supply chain



Focus: Development of solutions for management of interfaces of the licensing process

Main results 1/4
- Main challenges and needs -

Functionality of nuclear regulation and procedures

- Thorough knowledge of nuclear regulation and requirements is a prerequisite for functionality of procedures.
  - **Proper and consistent communication of requirement specifications along the supply chain** is a big challenge. Information may change or some of it even vanish in the interphases of supply chain.
- Requirements posed to the supply chain should be harmonised.
  - Licensee's requirements should be system-specific including identification of applicable YVL-guides and standards.
  - **Graded Approach-consept** should be applied.
- Part of suppliers considers YVL-guides explicit and precise enough and little need to change them.
  - There is a need for **unofficial contacts between suppliers and regulator** for correct interpretation of YVL-guides.
- Technical requirements are manageable, but problems arise in documentation and schedules.
  - **There are no big differences in the technical requirements of nuclear area and other safety-critical industry**.
  - The biggest challenge is the unpredictability of supervision and inspection timing, which may introduce large delays in production.

Main results 2/4
- Main challenges and needs -

Main challenges in utilisation of regulation and procedures overall

- Management of the supply process and documents varies from supplier to supplier, and no shared management platform is in use.
- Specific requirements in nuclear sector have introduced significant differences in design, production and supply processes as well as in final products and their documentation.

Main results 3/4
- Main improvement targets -

Regulations and procedures

- ❑Harmonised safety regulation in EU and especially in Nordic countries is a well-grounded target.
  - Harmonisation will benefit all stakeholders, it will facilitate and streamline operations, widen area of operation and decrease cost level.

- ❑Clarification of requirements, reduction of interpretation error, improved guidance to fulfilling requirements and increased utilisation of standard products are needed.
  - A more distinct difference is needed in practical supervision of components and structures in safety class 2 and 3.
  - Regulator should utilise Graded Approach -concept in supervision and inspection.

Main results 4/4
-Main improvement targets-

Supply chain and co-operation

- Suppliers should have larger and more active role in planning and execution of the entire project.
  - Continuous and effective co-operation from the very beginning of the project, clear guidelines and following them is essential.
  - Turnkey supply with fixed delivery time and cost should not be used in nuclear projects.
- Consortion or alliance model at general level and mutual projects between interested suppliers in specific areas were foreseen as development targets.
  - A new operation model is needed!
  - Regulator should take part in developing this new model!

Summary of the survey 2018

- Main results of the survey 2018 could be summarised as follows:
  - a) Interviewed company representatives expressed their strong support to this survey as means to introduce their concerns and needs for developing regulation.
  - b) Technical requirements in nuclear area can be managed and no significant differences exist compared to other safety critical industry areas.
  - c) Technical requirements and safety classification of separate structures and components should be harmonised at EU-level.
  - d) Major problems arise in document requirements, schedules and communication within supply chain.
    - Biggest challenge is poor predictability of inspection and supervision activities; this may introduce long delays in production.
    - Too extended requirements of documentation raise costs to a level, which hampers or even prevents commercial activities.
    - Licenseholder's role and responsibility in practical licensing process is emphasized.
  - e) Without major development of regulation and procedures there is a risk, some technology companies will pull out from nuclear area in Finland.

How to proceed – Outline proposal for next steps?

Challenges and focus of development in order/supply process