

Nuclear Reactor Regulation  
Karin Rantamäki

August 15, 2019

## Reactor Safety Committee Meeting 1/2019

Date June 12, 2019, 9:00-16:20

Place STUK, Laippatie 4, Meeting room Röntgen 4386

Participants	Timo Vanttola	Chair	
	Sylvie Cadet-Mercier	Member	
	Lennart Carlsson	Member	
	Ralph Schulz	Member	
	Zdeněk Típek	Member	
	Kirsi Alm-Lytz	Permanent expert member	
	Karin Rantamäki	Secretary	
	Juhani Hyvärinen	NSAC	
	Tomi Routamo	STUK	
	Tapani Virolainen	STUK	
	Jorma Ahonen	STUK	Items 1-3
	Kim Wahlström	STUK	Items 1-3
	Martti Vilpas	STUK	Items 1-3
	Petri Vuorio	STUK	Items 1-3
Absent:	Richard Donderer	Member	

### 1 Opening and adoption of agenda

Timo Vanttola opened the meeting at 9:01 and welcomed everyone.

Finland has a national Nuclear Safety Advisory Committee, NSAC, which gives statements and advice to STUK. The reactor safety committee RSC is an international advisory committee formally as a subcommittee of the NSAC. In practice, RSC advises STUK directly. The chair of the RSC has to be a member of the NSAC and reports of the activities of this Committee to the Advisory Committee.

The main duty of the committee is to give advice to STUK on the topic it has chosen. The Meeting minutes will be published on STUK's webpage. The presentations will be distributed to the members of the committee as appendices to the memorandum. However, they will not be published on the webpage.

The agenda was approved and can be found in Appendix 1.

### 2 Introduction of the participants

Round table introduction of the participants.

Nuclear Reactor Regulation  
Karin Rantamäki

August 15, 2019

### 3 Licensing and qualification practices for equipment approvals

Tapani Virolainen presented STUK's practices on equipment approvals. As a background he discussed the process and goals of approval of mechanical equipment as well as electrical and I&C equipment. STUK is also the competent authority of all pressure vessels at nuclear power plants including the non-safety-classified ones. Authorised inspection organisations are used for non-safety-classified, safety class 3 and partly for safety class 2 pressure vessels.

The committee discussed the status of the Authorised Inspection Organisations (AIOs). STUK approves the AIO to perform design reviews and inspections. The AIOs also need to have an accreditation. The AIOs have then the same rights as STUK and they give the approval of the component. If they do not give the approval the decision making returns back to STUK.

Tapani Virolainen introduced the nuclear industry project, KELPO, which works on the licensing model of nuclear installation components. He explained the main findings and challenges in the current process and gave an example of the current process for pumps or motors. STUK has started a discussion with the licensees about the situation. The licensees have given their suggestions for changes and proposals for new ways or methods on the equipment approvals. He also explained this new model proposed by the licensees. This model is being tested in a pilot projects in co-operation between the licensees. It will be further developed based on the experience obtained from these pilot tests.

STUK is already changing the approval process for serially manufactured equipment. The updated YVL-guides will give the possibility to use such components for pumps, valves and pressure vessel in Safety Class 2, 3 (SC2, SC3) and non-classified components. This new process is rather similar to the model proposed by the licensees.

Tapani Virolainen also discussed the work done at STUK. STUK has started a development project "Effective oversight" to implement STUK's new strategy 2018-2022. He also explained the project to develop NPP oversight processes in practice. This project is much broader than just equipment approvals.

The presentation slides can be found in Appendix 2.

**Zdeněk Típek** gave a presentation on the Czech practices. In the Czech power plants, the focus is on the plant modifications. Separate quality assurance programmes have been changed into lighter approval processes related to safety functions. These are approved by the authority, others are just sent for notification. The documentation related to modifications is received one month prior to the change according to the nuclear energy act. However, the authority receives a 3 year plan about modifications at NPPs. Mr. Típek also explained which documents are reviewed by the authority. The basic principle is that no components that compromise nuclear safety are allowed. Commercial grade components are used in lower safety classes. There is only one licensee for the Czech NPPs. This has some advantage when approving components for use in nuclear applications. He also discussed the roles of various inspection organisations in relation to various safety classes.

Nuclear Reactor Regulation  
Karin Rantamäki

August 15, 2019

He finished his presentation by giving a few examples on the most significant findings. An IRS-report was written on the case where several inspection levels failed to detect a problem in Nondestructive Testing (NDT). The lesson learnt was that oversight of contractors is very important. Another example he discussed was related to falsification of material certificates. The biggest lesson-learnt was that there is a need for competency and capability to do inspections. It is important to look also at the actual component, not just the paperwork related to it.

The presentation slides can be found in Appendix 3.

**Lennart Carlsson** gave an overview on the Swedish practices. In Sweden, the inspectorate is involved strongest during the installation phase. SSM approves various steps only when larger changes are made in the Safety Analysis Report (SAR). SSM is not so much involved in the manufacturing phase. The licensee has the responsibility to follow the manufacturing. There may be some changes in this procedure in the future.

There has been some discussion ongoing how the electrical and I&C equipment should be treated. Although the change is small it causes some need to build up competence at the control organization. One of the licensees also has a project to simplify the qualification process. The aim of this project is to use industrial standards instead of nuclear standards for some applications.

As an example of problems he mentioned a case where incorrect material had been used. The third party inspection worked as should since they noticed this. Consequently, a new component had to be manufactured and, as a result, the licensee increased its own staff in the inspection area.

SSM's philosophy is not to approve too much since that may cause the licensee not to build up their own competence. However, SSM requires the licensee to make sure that the products meet the requirements and the regulations. Thus, the responsibility is clearly within the licensee.

The presentation slides can be found in Appendix 4.

**Sylvie Cadet-Mercier** presented the French process. The biggest difference compared to Finland is that the equipment themselves are not approved except for pressure equipment. As the background, she explained the French regulatory process for new equipment implementation in modifications. For minor modifications, a control structure independent of the plant operation is required within the licensee's organisation. ASN is only informed about such modifications. Somewhat larger modifications are subject to ASN authorisation. Provisions are implemented to ensure that the modification is designed, validated and implemented in compliance with the regulations.

Since 2019 the graded approach is extended to all modifications. Non-notable modifications are identified in the licensee integrated management system. Notable modification are divided into two categories: those that are subject to declaration to ASN and those that are subject to ASN authorisation. An agenda is required for each modification. Thus, ASN is able to make inspections on any subject they choose. Due to the large fleet of similar plants, modifications are generally implemented in series on various plants. Therefore, it is important to collect feedback on the first installation. The feedback also guides

Nuclear Reactor Regulation  
Karin Rantamäki

August 15, 2019

the inspections. For pressure equipment a categorisation different from safety classification is used. These levels regulate the conformity evaluation. The requirements depend on the categorisation level and on the nuclear or radiological risk resulting from the failure. For new installations, the functional requirements are validated by the start-up tests and specific requirements by the qualification.

For conventional equipment the biggest problem is the regulatory requirement for traceability, detection and management of deviations, and the action plan. If these requirements are fulfilled standard or commercial grade equipment are acceptable. New inspection methodology concerning falsifications have been implemented. She finished her presentation by explaining ASN's oversight policy and strategic plan regarding the licensee's responsibility and independent oversight.

The presentation slides can be found in Appendix 5.

**Ralph Schulz** presented the Swiss practices, which are quite similar to those in Finland. Switzerland has a safety class SC4, which is PSA based and contains risk important systems and systems with large radioactive inventory. However, with respect to the AIOs, there is a big difference between the two countries. He explained in detail the four-step process for equipment approval. The manufacturer and the manufacturing is inspected by the licensee who has to report the results to ENSI. ENSI only does inspections if it considers them necessary. For SC1 and SC2 inspections are also made by AIO during manufacturing, installation and commissioning.

With respect to examples of significant findings, he first gave some general observations. He also discussed two specific examples, where the whole design had to be redone.

The presentation slides can be found in Appendix 6.

**Richard Donderer** had sent a presentation on German practices, but due to his absence it was not discussed in the meeting.

The presentation slides can be found in Appendix 7.

### **Summary of the discussion on the licensing and qualification practices for equipment approvals**

A lot of information was shared during the meeting. There are differences in the practices from country to country and consequently several ways to organise the equipment approvals. It is important and valuable to learn how other authorities do the work. There were very interesting examples in the presentations.

In order to implement STUK's new strategy and to adopt best practices from other countries, there is a need to perform an in-depth analysis of STUK's current regulatory approach to component approvals. STUK does a lot of work on inspections. The reorganising of the work should start with defining the goal of the inspections. It should make a study e.g. on the number of findings with respect to spent man-hours. This would give an indication on inspection efficiency. According to the result it may also give insight on the relevancy of the work. Of course, the amount of work also depends on the objective of the inspection work. STUK should also consider the added value of STUK doing the

Nuclear Reactor Regulation  
Karin Rantamäki

August 15, 2019

work. The division of duties among various organisations and their roles should be considered in general. Depending on the objective of the inspection, the scope and the extent of the work needs to be evaluated.

STUK's most important duty is to inspect that the organisations (license applicant or licensee and supply chain) perform properly. Another view is that the ultimate goal is that the plant as whole works safely. In the examples presented by the members, a number of organisational steps worked fine. However, some key steps were either missing or went wrong. The challenge is to identify the possible pitfalls in the most effective way.

There is obviously a dilemma for STUK to be resolved: STUK would like to change the regulatory process in such a way that some of its inspection practices could be relaxed. However, a confidence should be reached that the licensees first build up or demonstrate their competence to keep the nuclear safety at high level solely by their own processes. The safety level should not be compromised.

### **Summary of the various practices**

A good practice in many countries is that the licensees give early updates on forthcoming modifications. This enables the authority to plan what it wants to review or inspect and what is graded out of the inspection. In addition, the Czech experience was that sometimes more prescriptive and detailed guidance is needed to make the situation clear to all the parties involved. However, the Czech guidance is not binding as the Finnish YVL Guides. The conclusion was that STUK should think what its oversight means if inspections are not performed during and after manufacturing.

In Sweden the philosophy is that sometimes less is more. SSM does not approve but requires the licensee to ensure that the products meet the requirements. This makes the licensee's responsibility clear but also sets requirements to their level of competence and motivation.

France has recently changed the equipment approval strategy. The modifications are classified and treated according to this classification. Here is an inbuilt licensee responsibility as decisions on the importance level is needed. A clear remark was made that floor level oversight on-site is needed to find the real situations, problems and challenges instead of just document approval.

ENSI's practice to use IOs and engineering companies on a contract basis is interesting. For modifications on existing plants, similar industrial quality components as the original ones can be used in safety class 3. In Finland, the need to fulfil the newest safety requirements sometimes hinders the start of the modification even though it would be an important one.

For the next meeting it would be interesting to hear how much regulatory work each country is using per e.g. operating year.

Summary slides prepared by STUK on the meeting day can be found in Appendix 8.

Nuclear Reactor Regulation  
Karin Rantamäki

August 15, 2019

### Recommendations for STUK

- STUK should evaluate the value for work obtained by current practices.
- The cultural aspects and history need to be taken into account
- STUK should discuss with the licensee how the responsibility is demonstrated
- When the industry is more ready with the KELPO project (fully bears the responsibility of the change), STUK should start interacting more actively in KELPO
- The industry needs to demonstrate that they can take the responsibility. However, that doesn't mean that they need or should do the work STUK does. They need to find their own way to ensure the safety goals.

The committee expressed a wish to hear in a later meeting how the issues discussed during this meeting and the recommendations made by the committee have been realised.

### 4 Current status of the Finnish nuclear field

Kirsi Alm-Lytz briefly described the nuclear field in Finland. She explained some aspects of the operating units in Loviisa and Olkiluoto, as well the research reactor FiR 1, which was closed in 2015. In addition to the nuclear power plants, Finland also has a mine which is able to produce uranium as a side product. STUK published the safety assessment concerning the uranium retrieval on June 11, 2019.

She then gave a more detailed report on the status of Olkiluoto 3, for which the operating licence was granted in March 2019. The final readiness is inspected/stated before STUK gives the permit to start fuel loading. She then discussed the situation of the Fennovoima FH-1 project for which the construction licence phase is ongoing.

She finished her presentation by discussing the organisation of STUK describing the department of Nuclear Reactor Regulations in more details. At the end she briefly discussed STUKs strategy 2018-2022.

The presentation slides can be found in Appendix 9.

### 5 Any other business

No other business.

### 6 Next meeting

The next meeting will be held on December 10, 2019 at STUK.

### 7 Closing of the meeting

The meeting was closed at 16:35.

Distribution RSC members, NSAC members,  
PT, KiA, JHe, ToR, TV, KW, MV, PeV, JoA

Nuclear Reactor Regulation  
Karin Rantamäki

August 15, 2019

**Appendices**

1. RSC meeting 2/2018 agenda
2. Development of licensing and qualification practices (KELPO) - equipment approvals, presentation slides by STUK
3. Licensing and qualification practices - SÚJB, presentation slides by Zdeněk Típek
4. STUK questions in Sweden, presentation slides by Lennart Carlsson
5. RSC - Equipment approval , presentation slides by Sylvie Cadet-Mercier
6. Equipment Approvals - ENSI, presentation slides by Ralph Schulz
7. RSC June 2019 Answers Donderer, presentation slide by Richard Donderer
8. RSC meeting summary, presentation slides by Tapani Virolainen
9. STUK and regulation of NPPs, presentation slides by Kirsi Alm-Lytz