

*STUK Action Plan*  
*for*  
*recommendations and suggestion of*

**EU-27 REGULATORS PEER  
REVIEW**  
**EFFECTIVENESS OF STUK'S  
REGULATORY  
INFRASTRUCTURE  
FOR WASTE SAFETY**

Helsinki, Finland

*review carried out 2 to 6 November 2009*

**11. March 2010**

**Action Plan**  
**based on the recommendations and suggestions made in the**  
**REPORT**  
**TO**  
**RADIATION AND NUCLEAR SAFETY AUTHORITY (STUK)**  
**Helsinki, Finland**

This Action Plan has been prepared by STUK. In this Plan, the planned actions are documented after each recommendation and suggestion given in the Review Report. To help the reader, the original text of the report is repeated. Regarding the identified Good Practices, the action plan is to maintain all of them.

**Mission date:** 2 to 6 November 2009

**Regulatory body:** STUK

**Location:** STUK Headquarters, Helsinki, Finland

**Regulated facilities and practices:** *Nuclear power plants, fuel cycle facilities, medical and industrial sources, research applications, waste facilities, decommissioning and remediation*

**Organized by:** STUK

**EU Review Team:**

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**STUK Co-ordination:** Kaisa-Leena Hutri

## **EXECUTIVE SUMMARY**

On 2-6 November 2009 a team of 11 European regulators carried out an EU 27 Peer Review of STUK's processes for regulating radioactive waste management activities in Finland. Due to the short time period of the review it focussed its attention upon STUK's regulation of the proposed spent fuel repository at Olkiluoto and its associated rock characterisation facility ONKALO.

The team concluded that STUK has a well established and apparently effective and efficient basis for regulating nuclear waste management in Finland. This is particularly impressive as the development of the Olkiluoto repository is at an early stage without as yet a fully developed safety case. Nevertheless the team feels that generally STUK needs to review its guides and regulations which are currently based upon NPP to ensure that they are sufficiently clear for the purposes of regulating waste management and to ensure greater transparency of requirements to stakeholders

## 1. INTRODUCTION

STUK has invited European regulators to participate in an EU-27 Peer Review of its processes for regulating radioactive waste management activities in Finland. This peer review took place on 2-6 November 2009.

Within the time frame available the team was unable to carry out a review of all STUK's activities in the area of radioactive waste management e.g. at the nuclear reactor sites, so it focussed its attention upon the regulation of the proposed spent fuel repository at Olkiluoto and its associated rock characterisation facility, ONKALO, both to be managed by the prospective Licensee company Posiva Oy.

The team recognised that STUK had carried out its own internal peer review and the team findings in this report are in addition to those findings. In common with STUK's own peer review the team decided to carry out its peer review using the modules defined by the chapters of GS-R-1, "Legal and Governmental Infrastructure for Nuclear, Radiation, Radioactive Waste and Transport Safety".

Following Finnish Governments' Decision in Principle (DiP) in December 2000 and subsequent endorsement by the municipality in Eurajoki and the Parliament (2001), Posiva started activities to establish an underground rock characterisation facility (URCF), as required in the DiP.

Posiva plans to submit a license application in 2012 for the construction of a spent fuel repository which will include the integration of the URCF as part of the repository. Thus, although the URCF is not licensed as a nuclear facility STUK is reviewing and assessing the ongoing work of Posiva as if the Onkalo URCF facility was licensed as a nuclear facility.

STUK has used the experiences from the regulatory overview of the construction of the URCF so far to develop and improve the regulator guidance documents as well as STUKs internal guidance documents, i.e. the management system of STUK.

STUKs system of regulatory guides on nuclear safety (YVL – external guides and YTV – internal guides) contains guidance on radioactive waste management, including management and disposal of spent nuclear fuel and regulation of these activities. STUK is currently in the final stages of establishing new regulatory guides that better address the planned licensing of a repository for spent nuclear fuel which will replace some of the previous guidance documents.

### 1.1 REFERENCES FOR THE REVIEW

The most relevant document used for the review was the IAEA safety standard GS-R-1, "Legal and Governmental Infrastructure for Nuclear, Radiation, Radioactive Waste and Transport Safety". This document was a basis for the questionnaire prepared and answered by STUK in advance of the mission.

### 1.2 CONDUCT OF THE REVIEW

On the 1 November 2009 in Helsinki, an opening team meeting was conducted to discuss the specifics of the mission, to clarify the basis for the review and the background, context and objectives of the mission and to confirm the methodology for the review and evaluation.

The mission entrance meeting with STUK senior management was held on Monday, 2 November 2009. Opening remarks were made by STUK Director General Jukka Laaksonen, the STUK Nuclear Waste and Material Department Director Tero Varjoranta and by the Team Leader Frans Boydon.

On 3 November 2009 the team visited Olkiluoto to see the facility and the existing waste repository for LILW. Advantage of the visit was taken to interview Juhani Vira (Vice President of Research for Posiva) to obtain information to assist the team in its review discussion taking place later in the week. The topics covered included:

- The process by which Posiva understands STUK's requirements of the safety case,

- The process by which Posiva would inform STUK of changes to its safety case,
- The need for Posiva to demonstrate that it understands its safety case and manages the change to an operational company from one of design, research and construction whilst ensuring that necessary skills are available,
- The role of STUK in Posiva's interactions with stakeholders,
- Past difficulties in interpreting STUK requirements from expert team findings,
- Funding
- Transport responsibilities
- How and whether retrievability needs to be considered,
- How the encapsulation plant and the repository would be licensed (together or separately), and
- Regulatory issues associated with dealing with a facility which is not yet a licensed facility.

During the remaining days of the mission, a systematic review was conducted for all the following review modules:

- Module 1 - Legislative and governmental responsibilities
- Module 2 - Management system of the regulatory body
- Module 3 - Authorization process and requirements on the applicant(s)/licensee(s)
- Module 4 - Review and Assessment procedures
- Module 5 - Inspection and Enforcement
- Module 6 - Development and implementation of regulations and guidance
- Module 7 - Organization of the Regulatory Body
- Module 8 - Stake-holder relationship, public involvement

The review was conducted through meetings, interviews and discussions and visits to Olkiluoto site.

*The Review Team identified a number of good practices and made recommendations and suggestions where changes are necessary or desirable for the continuous improvement of the effectiveness of regulatory oversight over the Olkiluoto site.*

The exit meeting was held on Friday, 6 November 2009, with STUK staff involved in the mission. A copy of the final report of the mission was presented to STUK during this exit meeting.

## **2. LEGISLATIVE AND GOVERNMENTAL RESPONSIBILITIES AND DEVELOPMENT AND IMPLEMENTATION OF REGULATIONS AND GUIDANCE (MODULE 1 AND 6)**

The legislative and statutory framework established to regulate waste management are: the Nuclear Energy Act (1987) (NEA) that prescribes that generators of nuclear waste are responsible for all nuclear waste management (storage and disposal) and have to provide adequate financial resources for these activities, and the Radiation Protection Act (1988) that regulates radioactive waste arising from other practices than nuclear power activities. These two Acts were updated in 2008. The Transparency Act also ensures an appropriate framework for transparency in the regulation of radioactive waste. These are supplemented by 4 decrees one of which deals specifically with safety of disposals. Another one relating to safety in NPP addresses issues of temporary storage of waste and nuclear fuel. These decrees were also revised in 2008. STUK guides further complement this regulatory infrastructure with detailed binding requirements.

A few highlights are worth mentioning:

- STUK considers that the responsibilities of the different bodies (i.e. STUK and ministries) are clearly defined and that lately good communication has been established with the different ministries ( e.g. transportation, health,..) to clarify their respective roles;
- STUK has only limited relations with the Ministry of Environment as this Ministry appears to have very restricted competence and interest in the area of nuclear power production and waste management.
- STUK has additional responsibilities rather than being only a regulator (e.g. STUK is responsible for orphan waste management and STUK also provides commercial services)

### **Good Practices:**

GP1&6 1: The overall regulatory framework (legislative infrastructure and STUK regulations) seems to address in a comprehensive way the issues of waste management and clearly defines the responsibilities. STUK has been given by law appropriate means for regulating waste management facilities and implementing coercive actions.

GP1&6 2: In Finland there is long term coherent political commitment to implement a geological repository and the regulatory process for implementing the geological disposal is well defined.

GP1&6 3: STUK is highly involved in the issue of national regulations relating to waste management issues (STUK establishes draft documents for Ministries)

GP1&6 4: The process for issuing guidance is well established and involves a staged consultation procedure with the various interested parties (operators, experts, Advisory Committee for Safety). STUK has implemented a periodic review for updating its guidance

### **Recommendation**

R1&6 1: It is recommended that STUK should finalise the development and update of its internal and external guidance with regard to waste management regulation and supervision. This is because it is felt that currently there may be gaps and a lack of clarity regarding some of this guidance and the date for the license application is imminent.

*Action: STUK-YVL-D-series guides will be issued as soon as practically possible. A project on Construction License requirements and review (LOLA) has been established and has been implemented to review all YVL-guides (external guides) in order to identify requirements and regulatory guidance relevant to encapsulation and disposal facility. Under the same project, during the review of Posiva's licensing submittals and supporting documentation in 2010, the adequacy of*

current regulatory guides is considered. The findings will then be fed into the process of updating the regulatory guides.

- Targeted completion date: January 2011
- Responsible person: Jussi Heinonen

### **Suggestions**

S1&6 1: Although STUK appears to be independent (with respect to its competence and powers given by law), some modifications in the governmental organisation and the process for issuing licences could be considered. The Ministry of Employment and Economy appears to have the leading role for all aspects of nuclear energy. The fact that it is issuing the license under the NEA and at the same time is promoting the use of nuclear energy is a clear conflict of interest, although this has apparently not lead to any specific problems so far.<sup>1</sup>

*Action: This suggestion refers to the promotional and supreme authority roles of MEE in the area of use of nuclear energy (strictly speaking MEE prepares, introduces and defends the license decisions, which the Government will decide based on MEE's motion. This dual role has been identified also before, for example by the IAEA's IRRT mission, when STUK undertook to prepare a report on the issue for the ministry. No change in MEE's role documented in legislation has taken place. From its own standpoint, STUK would be prepared to have the responsibility to grant construction and operating licenses for nuclear facilities. STUK will take the Suggestion to MEE's attention.*

- Targeted completion date: June 2010
- Responsible person: Tero Varjoranta

S1&6 2: Although radioactive waste management streams are relatively straight forward STUK should contemplate issuing a national plan for all of its radioactive waste management (rather than just for NPP waste). For some waste (including some for which STUK is directly responsible but also for waste that will arise from research reactors decommissioning) there is no identified disposal stream.

*Action: It has been agreed that STUK prepares such a plan for other than NPP-wastes (for them such plans exist) and recommend that Ministry of Social Care and Health ( MSCH) will issue it.*

- Targeted completion date for taking the plan to MSCH: June 2011
- Responsible person: Risto Paltemaa

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<sup>1</sup> Although not within the scope of this mission a further conflict of interest exists. This is because STUK reports directly to the Ministry of Social Care and Health (and receives part of its budget out of this ministry) which is also the Supreme Authority for the use of radiation in health care.

Action: STUK will take this issue to the attention of the MSCH

- Target date: December 2009
- Responsible Person: Jukka Laaksonen

S1&6 3: Consideration should be given as to whether detailed disposal solutions for all types of waste should become a prerequisite in the NEA for granting a Decision in Principle for new NPP as currently these arrangements are only considered at a late stage in the authorisation process.

*Action: Since this matter is not in STUK's mandate, the suggestion will be taken to MEE's attention.*

- *Targeted completion date for taking the suggestion to MEE: June 2010*
- *Responsible person: Tero Varjoranta*

S1&6 4: The regulations should be made consistent with respect to the issue of retrievability and STUK should define the safety requirements necessary to take into account this principle.

*Action: Earlier "retrievability" was included in the safety regulations issued by the Government but is currently not. However, Posiva's Decision in Principle was made by the Government and ratified by the Parliament, when this requirement for retrievability was in place. STUK will provide guidance to Posiva, how this retrievability issue from DiP is to be handled in technical level in the construction license phase.*

- *Targeted completion date: December 2010*
- *Responsible person: Tero Varjoranta*

S1&6 5: In order to avoid conflicts of interest, STUK should contemplate modifications to some of its non regulatory activities to ensure that the same degree of oversight is applied to these roles perhaps by sub-contracting to private companies which it could then regulate. Examples include: STUK is responsible for nuclear waste facilities while at the same time being the regulator for these activities. STUK provides services to operators of nuclear facilities (such as radiation protection monitoring, environmental monitoring) whereas it also regulates radiation protection and discharges from these installations. This could lead to a loss of public trust in the independence of the regulator.

*Action: STUK has identified this possible conflict of interest before. Regarding waste management issues, a private company has been established and waste management responsibility will be transferred from STUK's Department of Research and Environmental Service to this company. (Even though not in the scope of this Peer Review, radiation protection services have been transferred from STUK to a private company).*

- *Targeted completion date regarding waste management (implementer responsibility) in STUK: October 2010*
- *Responsible person: Mari Andersin*

### 3. ORGANISATION AND MANAGEMENT SYSTEM (MODULE 2 AND 7)

STUK has good organisational and management systems. The processes supporting these systems are reported in a comprehensive way. If these processes are correctly implemented, they should allow STUK to fill its mission in an efficient way.

#### **Good practices**

GP2&7 1: STUK is in a position to adapt its resources to meet the increased demands from the repository construction.

GP2&7 2: STUK has a very efficient process to identify its future competence and resource needs. These needs are reassessed together with the strategic plan revisions to inform training and resource requirements.

GP2&7 3: Waste management inspectors at STUK participate in inspections at nuclear power plants and this is considered as very positive in order to furthering cross-fertilisation.

#### **Suggestions**

S2&7 1: STUK should consider creating some working groups consisting of STUK staff and external experts to benchmark safety related computer codes used by the license applicant.

*Action: Working Group will be established as suggested.*

- *Targeted completion date: WG to start work by October 2010*
- *Responsible person: Arto Isolankila*

S2&7 2: STUK should consider introduce a marking system for operator performance as a part of STUK inspection practices. This system should facilitate the communication with the operator in order to illustrate trends in performance.

*Action: Project for establishing the performance indicators will be established.*

- *Targeted completion date: Project to be nominated by September 2010. First task to prepare a project plan with the objective of introducing the performance indicators for management approval.*
- *Responsible person: Arto Isolankila*

S2&7 3: STUK should continue to increase its interactions with Posiva to enable better understanding of the safety related expectations of the regulator, and to resolve open technical issues.

*Action: Increase of the interactions will be continued. A management teams' forum will be established for regular (twice a year to begin with) interactions and a medium management level forum will be established for discussing the practical implementation of regulations. Also, the ongoing LOLA-project will address this suggestion.*

- *Targeted completion date: for management level forum by February 2010 (Tero Varjoranta), and for medium level management level meetings March 2010 (Jussi Heinonen)*
- *Responsible person: Tero Varjoranta and Jussi Heinonen*

S2&7 4: STUK should consider implementing mechanisms/processes in order to verify assessment work performed by external contractors (and ensuring independence where appropriate).

*Action: Process to verify the assessment work by external contractors will be established and documented as an YTV-guide.*

- *Targeted completion date: August 2010*
- *Responsible person: Kaisa-Leena Hutri*

S2&7 5: STUK should consider formalising processes to assist in its use of external expertise. Procedures should describe the conditions under which such external support is required, on which basis the experts are nominated, the selection criteria and the way expert judgement and results are assessed and used.

*Action: Process describing how external expertise is used will be formalized as an YTV-guide.*

- *Targeted completion date: October 2010*
- *Responsible person: Kaisa-Leena Hutri*

#### 4. AUTHORISATION BY THE REGULATORY BODY (MODULE 3)

The licensing process consists of three steps:

1. Decision in Principle – granted by the Government but must be confirmed by Parliament
2. Construction licence – granted by the Government
3. Operating licence – granted by the Government

The operating licence for the Olkiluoto LILW repository is valid until 2051. For the spent fuel repository, it is not yet decided whether there will be a separate licence for the encapsulation facility. Retrievability is no longer included in the revised Nuclear Energy Act of 2008 however, the Decision in Principle for the repository was prepared before revision of the Act and includes retrievability as an option.

Closure is not defined in the law, nor does the operating licence of the LILW repository contain any provisions for closure. The ownership of the repository will pass from the operator to the state after a confirmation by STUK that the licence holder has fulfilled its obligations for disposal. "Monitoring and control" after closure is mentioned in the law, but is not defined in detail yet.

Only facilities with considerable general significance require a Decision in Principle. The classification of significant systems, structures and components is described in YVL 2.1, which is applied by analogy to waste management facilities.

The format and content of documents to be submitted in support of a licence application are described in the Nuclear Energy Decree and in specific regulatory guides. STUK is in the process of developing such guidance which is specific to waste repositories. The current drafts of E.3 and E.5 focus primarily on safety issues and provide only little guidance on the format of the documents to be submitted by the applicant. Such guidance is foreseen in the IAEA GS-R-1 para.5.4.

Periodic safety reviews need to be carried out at least every 15 years (government decree and guide E.5). This ensures that feedback from previous stages and from operating experience is taken into account.

#### **Recommendation**

R3 1: A separate authorisation procedure for closure is recommended to be included in the nuclear legislation as this is not currently included. Guidance on closure should be included in the guide on disposal of nuclear waste. Closure is an important process, by which the repository is converted from an operated and continuously supervised facility into a facility which must provide passive safety over long timescales. Closure therefore has to be very carefully planned well in advance.

*Action: A separate Working Group will be established to address the issue of the suggestion.*

- *Targeted completion date: WG established by January 2011*
- *Responsible person: Risto Paltemaa*

#### **Suggestions:**

S3 1: Complete a guide for the classification of significant systems, structures and components for waste management facilities as currently this guidance is only available for NPPs.

*Action: Classification document for Onkalo exists. With respect to other parts, new regulatory guide B.1 on classification is in drafting process and waste management facilities will be included.*

- *Targeted completion date: January 2011*

- *Responsible person: Jussi Heinonen*

S3 2: Guides D.3, D.4 and D.5 should include more details on requirements concerning the format and the contents of the documentation to be submitted for authorization.

*Action: Format and content of documents will be specified in the new YVL-Guide A.1. (previously YVL 1.1). Pre-Construction License application review will provide testing opportunity to verify how well A.1. is functioning.*

- *Targeted completion date: June 2011*
- *Responsible person: Risto Paltemaa*

S3 3: STUK should clarify whether the encapsulation plant will be subject to a separate license from the repository.

*Action: Legislation allows both possibilities; a separate or combined license. STUK will discuss this matter further with MEE and Posiva.*

- *Targeted completion date: June 2010*
- *Responsible person: Tero Varjoranta*

## 5. REVIEW AND ASSESSMENT PROCEDURES (MODULE 4)

STUK has a well established review and assessment procedures from its experience with nuclear power plants and is implementing an analogous system for its assessment of the repository documents.

### **Good practices**

GP4 1: There is a structured process for tracking documentation between Posiva and STUK.

### **Recommendations**

R4 1: It is recommended that STUK should consider better defining its targets (and their derivation) for probabilistic safety assessment especially with respect to radiation protection because of the long term planned life of the facility.

*Action: A project will be established to consider and suggest for management approval targets for PRA.*

- *Targeted completion date: Project established by June 2010, suggestions to management by December 2010.*
- *Responsible person: Arto Isolankila*

R4 2: It is recommended that STUK should clarify in its regulations what its requirements are of an operating licensee. These requirements should ensure that Posiva is staffed with sufficient and appropriate competence and resources that properly understand the basic safety principles and the safety case that it has appropriate safety management systems and that staff are properly authorised and qualified to carry out safety related tasks.

*Action: Project to clarify requirements for operating license will be established. The project will also document differences between the level of details needed for construction and operation licenses. With respect to the requirements for Posiva staffing (latter part of the suggestion), the issue will be incorporated in the process of preparing the new YVL A.4-guide.*

- *Targeted completion date: First part of action by June 2010, latter by December 2010*
- *Responsible person: Jussi Heinonen*

### **Suggestions**

S4 1: STUK should provide clarity upon how expectations that disposal systems are optimised are enshrined within its expectations and requirements.

*Action: An internal project will be established to consider and, if needed, to provide suggestions for such clarifications.*

- *Targeted completion date: project established by April 2010, first milestone to prepare a project plan for management approval by August 2010.*
- *Responsible person: Arto Isolankila*

S4 2: STUK should request that Posiva sets operational limits and waste acceptance criteria at an early stage for the encapsulation and repository facilities based on normal and abnormal scenarios with time derived from the safety case. This is considered important to aid future planning.

*Action: STUK management will discuss this issue with to Posiva. Objectives include to ensure that design, construction and operation of encapsulation and disposal facilities are consistent with the specifications, assumptions, quantities and types of normal and leaking spent fuel, fuel materials, support structures and materials, operational history of the fuel (such as maximum burn-ups, gas gap contents, pellet integrity, etc. details) are consistent with the safety analysis, which forms the licensing basis and operational limits (technical specifications) for the facilities.*

- *Targeted completion date: first milestone (discussions with Posiva Management) by May 2010, and internal action plan for management approval by September 2010.*
- *Responsible person: Risto Paltemaa*

S4 3: STUK should consider recording the basis of decisions upon whether to accept or reject suggestions proposals from external experts. For reasons of traceability and clarity, it is important to keep thorough records of what advice has been supported or rejected by STUK in its regulatory review and assessment activities, and what advice has been rejected.

*Action: This suggestion to be included in the internal YTV-guide regarding use of external experts.*

- *Targeted completion date: August 2010*
- *Responsible person: Kaisa-Leena Hutri*

S4 4: STUK should consider developing systematic internal guidance for the development of review plans (project plans).

*Action: STUK prepares on case by case basis plans how to review major documentations and submittals provided by Posiva and NPPs. Plans are initiated and approved by the management. However, for all documents and materials this is not done in a systematic manner. Internal YTV-guide will be revised to address this issue in systematic manner.*

- *Targeted completion date: October 2010*
- *Responsible person: Kaisa-Leena Hutri*

S4 5: STUK should clarify if institutional control after closure will be a legal requirement (see also recommendation 3.1).

*Action: Nuclear legislation requires permanent disposal, which as a safety concept can not be designed on active measures after closure. The legislation states includes broad procedures by which the responsibility of the closed repository transfers from Posiva to Government, thus releasing Posiva from any subsequent responsibilities. However, the legislation also states that the State has the possibility to take any actions it deems needed in order to monitor and control the wastes. With respect to safeguards-obligations, the State is responsible for its international obligations (mainly NPT) for longer period of time, which requires active institutional controls from the State's side.*

- *Targeted completion date: Written clarification on the issues by December 2010*
- *Responsible person: Mari Andersin*

S4 6: STUK should consider a method of recording and tracking decisions and agreements made during the authorisation process.

*Action: Establishment of such a system has started. Firstly, an inventory of all decisions (statements, positions, letters of approval, inspections protocols) including any requirement, complaints and/or remarks given to Posiva are made. These are then grouped and a tracking system is designed and realized.*

- *Targeted completion date: December 2010*
- *Responsible person: Henri Niittymäki*

## **6. INSPECTIONS (MODULE 5)**

STUK currently exerts regulatory control over the ONKALO construction using internal guide (YTV5.2.4) with the ultimate aim of ensure that the host rock demonstrates properties that are essential for demonstrating the long-term safety of the proposed repository. In this context, inspections are carried out on-site to verify the practical implementation of the regulatory requirements and these also cover the management system and safety culture of the implementer. During the subsequent demonstration phase further inspections may be carried out to help build confidence in the safety case developed by POSIVA. Later-on, inspections will be arranged on research activities to follow-up the construction, operation and closure of the project.

The inspections are carried out on a periodic basis and planned using a well established and documented STUK programming methodology which also provides detailed information on the targets and contents of the planned inspections. Further inspections or participation at POSIVA audits on suppliers can be arranged when needed.

STUK inspectors are highly qualified experts who can also be involved in the regulatory review activities at STUK headquarters.

STUK puts high emphasis on the need for proper documentation and a process for following up issues and observations of the inspections. Inspection protocols are accessible to the public on request. An electronic system is being developed to aid the reporting and follow-up of inspection findings.

Legislation is in place for STUK to enforce its orders for corrective actions in a graded manner both during and after inspections and guidance is available to inspectors on how to use those measures.

While there are no legal requirements as to the qualification of inspectors, training of new inspectors is done via standard STUK training courses, the mapping of qualifications and the development of a tailored training programme, partly building on senior tutor inspectors.

### **Good Practices:**

GP5 1: STUK has fully integrated its inspection activities at ONKALO in its well developed overall inspection methodology which covers systematic and detailed periodic planning, reporting, follow-up and legally supported enforcement measures. These are documented in a comprehensive set of guidance, while at the same time provides sufficient flexibility for their adaptation to specific circumstances.

GP5 2: Inspection protocols, including a description of the inspection purpose, identified non-conformities and time limits for corrective actions, are available to the public on request. This greatly helps in the establishment of public trust in the regulatory oversight of STUK.

GP5 3: An electronic system is being developed to aid reporting and follow-up of inspection findings, including very helpful features such as tracking of imposed deadlines for corrective actions. This system will improve the access to inspection results and their interrogation as well as helping to avoid failures to follow-up corrective actions.

GP5 4: STUK establishes an individual training map for each freshly recruited inspector, building on the already existing knowledge and capabilities. This helps to speed up the training process and avoids wasting time for unnecessary standard training courses.

GP5 5: Inspectors carrying out review tasks at headquarters, provides a much better understanding of the overall regulatory approach rather than limiting tasks to field inspections.

### **Suggestions:**

S5 1: STUK is encouraged to develop additional guidance as to define more precise inspection targets, criteria and benchmarks. Currently inspectors decide on specific findings based primarily on their personal judgement against benchmarks developed by Posiva whereas STUK benchmarks could provide a better basis for taking corrective actions.

*Action: The suggestion is referring to the fact that STUK inspectors do not have precise internal guidance on what to use as inspections criteria and benchmark (i.e. based on what written guidance an inspection observation should be approved or rejected). The internal procedure for inspection planning and implementation is reviewed to take into account the Suggestion.*

- *Targeted completion date: December 2011*
- *Responsible person: Risto Paltemaa (with Mari Andersin)*

S5 2: Whenever appropriate STUK should adapt its detailed inspection guidance for inspections carried out by STUK on NPP reactors, to inspections on geological disposal facilities.

*Action: This continues to be a guiding principle. It will be recorded in internal YTV-guidance.*

- *Targeted completion date: December 2010*

- *Responsible person: Katriina Labbas*

S5 3: STUK should clarify its use of consultants for waste management inspections especially their rights, duties, notification procedures etc which have been clearly defined for OL3.

*Action: This will be recorded in internal YTV-guidance.*

- *Targeted completion date: December 2010*
- *Responsible person: Katriina Labbas*

S5 4: STUK should develop a methodology for the inspection and evaluation of safety culture. The use of indicators during routine inspections and trending as applied by regulators in some other countries should be studied in this context.

*Action: A methodology development has been started. It will be recorded in internal YTV-guidance.*

- *Targeted completion date: December 2010*
- *Responsible person: Tero Varjoranta*

S5 5: STUK is encouraged to complete an outline inspection concept for the 2012 demonstration phase preceding the licence application. In particular STUK is encouraged to develop a vision on which of Posiva's R&D activities STUK would like to pursue and validate. The demonstration phase is a key in the context of the construction licence; therefore STUK should put high emphasis on developing confidence in the safety case and its underlying investigations, tests and experiments.

*Action: The suggestion includes three parts: (1) the ongoing project addressing the suggested inspection concept will be completed, (2) STUK's vision regarding the R&D will be developed and documented in internal YTV-guidance, and (3) high emphasis on confidence in safety case in demonstration phase will be indicated in the demonstration phase review plan*

- *Targeted completion date: December 2010*
- *Responsible person: for (1) and (3) Jussi Heinonen, for (2) Kaisa-Leena Hutri*

S5 6: STUK should consider integration of inspection findings in the overall evaluation process. Currently their role is unclear.

*Action: Internal YTV-guides will be reviewed to ensure the integration.*

- *Targeted completion date: December 2010*
- *Responsible person: Risto Paltemaa*

S5 7: STUK should further develop the tracking of decisions, possibly as part of the electronic reporting and follow-up system as at present only issues arising and observations appear to be catalogued.

*Action: As Suggestion 4 6: Establishment of such a system has started. Firstly, an inventory of all decisions (statements, positions, letters of approval, inspections protocols) including any requirement, complaints and/or remarks given to Posiva are made. These are then grouped and a tracking system is designed and realized.*

- *Targeted completion date: December 2010*

- *Responsible person: Henri Niittymäki*

S5 8: STUK is encouraged to develop specific training courses for inspectors to provide a detailed understanding of the overall regulatory approach for geological disposal, specific inspection methodologies and tools rather than just relying on a mentoring system.

*Action: This suggestion will be taken into account when further development of the training program of WS inspectors of STUK's Department of Nuclear Waste and Materials Regulations (YMO) is considered for 2010. Understanding of the overall regulatory approach will be an essential part of the program. Based on the good results of the mentoring system, it will remain as the main mechanism of on-job training supported by class room events.*

- *Targeted completion date: December 2010*
- *Responsible person: Risto Paltemaa*

S5 9: It was not clear whether STUK's internal QA system to ensure that regulatory decisions and activities are properly endorsed and of the right quality is actually written down. If not then STUK is encouraged to develop a written system of internal QA.

*Action: STUK has a QA system documented in the Quality Manual. This includes procedures regarding the formal decision making process and how to document them, including who can sign letters accordingly (internal STUK-Guides 2.1 and 2.2). However, some internal departmental YTV-guides will be revisited to review the clarity of the procedures for waste safety operations (including halting operations on safety grounds, which would have this power and whether any form of senior endorsement is required, the process for endorsing assessment data e.g. provided from research activities but used in a safety case).*

- *Targeted completion date: June 2011*
- *Responsible person: Kaisa-Leena Hutri*

S5 10: Once the first module of the electronic reporting and follow-up tool is in operation, STUK should aim at a further development of the system towards an integrated tool for the recording and follow-up of all verification activities conducted both on-site and at headquarters.

*Action: Will be addressed once the electronic system is available.*

- *Targeted completion date: 6 months from the electronic system is available*
- *Responsible person: Henri Niittymäki*

## 7. STAKEHOLDER RELATIONSHIP, PUBLIC INVOLVEMENT (MODULE 8)

STUK informs and communicates with several stakeholders on a regular basis. Besides fulfilling the legal reporting requirements and participating in many international activities, STUK invests a considerable amount of resources into communication with the public. In fact the team considers STUK's way of dealing and communicating with the public to be a veritable highlight.

In the area of public information, STUK focuses on the need for clear information as quickly as possible. This includes information put on the STUK website, press releases, articles in print media and interviews, information campaigns, leaflets, open door events, and introductory courses for journalists (in special 5-day courses, which are organized about once a year).

The information on decisions taken by STUK, reviews of safety cases and licence applications, as well as inspection reports are available upon request according to the public information law. Certain publications, which STUK considers to be of wide public interest, are put on the web.

A few highlights are worth mentioning:

- Municipalities have a veto right at the Decision in Principle stage only and STUK undertook a large public information exercise at that time
- STUK focuses on *local* public and *local* decision makers to gain confidence and to improve their factual knowledge whilst retaining its independence from the industry.
- Extended efforts to find out the local public's needs by seeking professional expert knowledge.
- Clear strategy on public relations: No common events with Posiva, only on invitation of the municipality.
- STUK high-level management tour to start with. Senior management committed to this role of STUK.

### **Good Practices:**

GP8 1: STUK's strategy to obtain public confidence is very effective: well-defined key audience, clear objectives in public communication and realistic analysis of stakeholders' information needs.

GP8 2: STUK has defined clear and simple principles for communication with the public:

- a. STUK provides prompt, best available information instead of delayed, correct and detailed scientific information
- b. STUK takes no energy policy view
- c. STUK keeps independent from nuclear industry
- d. STUK focuses on information needs at municipality level

GP8 3: All staff involved in the review of disposal sites is trained in public communication.

### **Suggestions:**

S8 1: STUK should review its policy to make available reports and reviews on their website. Reports on for example, safety case reviews, reviews of licence applications, or inspection reports,

are not on STUK's website, but are only available upon request. For the interested public it is difficult to know what STUK reports are actually available on request.

*Action: All report and reviews will be made available*

- *Targeted completion date: December 2010*
- *Responsible person: Kai Hämäläinen*

S8 2: STUK is encouraged to publish on their website their licensing requirements for the construction of a repository for spent fuel. STUK is also encouraged to make available their plans and procedures for the review of the licence application. The licensing requirements are an important part of the licensing process, which should be as transparent as possible to the stakeholders especially as the Construction License application is due in 2012.

*Action: Will be published*

- *Targeted completion date: December 2010*
- *Responsible person: Risto Paltemaa (with a new hire trainee)*

S8 3: STUK may wish to consider placing its own internal guidance and details of its review documents on the internet where appropriate. These would be available through Freedom of Information but their open publication may increase public confidence.

*Action: Will be done on case-by-case basis*

- *Targeted completion date: December 2010*
- *Responsible person: Risto Paltemaa (with Mari Andersin)*

## **8. OVERALL CONCLUSIONS**

The team has concluded that STUK has a well established and apparently effective and efficient basis for regulating nuclear waste management in Finland. This is particularly impressive as the development of the Olkiluoto repository is at an early stage without as yet a fully developed safety case. Nevertheless the team feels that generally STUK needs to review its guides and regulations which are currently based upon NPP to ensure that they are sufficiently clear for the purposes of regulating waste management and to ensure greater transparency of requirements to stakeholders.



## APPENDIX I – LIST OF PARTICIPANTS

<b>EXPERTS:</b>		
1. Frederic <b>BERNIER</b>	<i>Federal Agency for Nuclear Control (FANC)</i>	<a href="mailto:frederic.bernier@fanc.fgov.be">frederic.bernier@fanc.fgov.be</a>
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8. Bengt <b>HEDBERG</b>	<i>Swedish Radiation Safety Authority (SSM)</i>	<a href="mailto:bengt.hedberg@ssm.se">bengt.hedberg@ssm.se</a>
9. Wolfgang <b>HILDEN</b>	<i>DG TREN, European Commission</i>	<a href="mailto:wolfgang.hilden@ec.europa.eu">wolfgang.hilden@ec.europa.eu</a>
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11. Frans <b>BOYDON</b>	<i>Health and Safety Executive (HSE)</i>	<a href="mailto:frans.boydon@hse.gsi.gov.uk">frans.boydon@hse.gsi.gov.uk</a>

## APPENDIX II – MISSION PROGRAMME

MISSION PROGRAMME		
<b><i>Sunday, 1 November 2009</i></b>		
16:00	<i>Opening Team Meeting</i>	
<b><i>Monday, 2 November 2009</i></b>		
09.00 - 17.00 17.00 – 18.00	<i>Presentations</i>	
	<i>Team Meeting</i>	
<b><i>Tuesday, 3 November 2009</i></b>		
08.00 -22.00	<i>Visit to Olkiluoto and Discussion with Posseva</i>	
<b><i>Wednesday, 4 November 2009</i></b>		
08.30 – 18.00	<i>Meetings and Discussions with STUK</i>	
<b><i>Thursday, 5 November 2009</i></b>		
08.30 – 12.00	<i>Writing and completing draft report</i>	
13.00 – 17.00	<i>Meeting with STUK to discuss report and carry out any changes</i>	
<b><i>Friday, 6 November 2009</i></b>		
09.00 – 10.00	<i>Complete presentation on Findings</i>	
10.00 – 11.30	<i>Close out Meeting</i>	

## APPENDIX III – COMPOSITIONS OF THE WORKING GROUPS

Tem	Subject Area	Mission Experts	Lead Counterparts
<b>I</b>	<b>LEGISLATIVE AND GOVERNMENTAL RESPONSIBILITIES DEVELOPMENT AND IMPLEMENTATION OF REGULATIONS AND GUIDANCE</b>	<ul style="list-style-type: none"> <li>• Geraldine Dandrieux</li> <li>• Darius Lukauskas</li> <li>• Juraj Homola</li> <li>• Wolfgang Hilden</li> </ul>	<ul style="list-style-type: none"> <li>• Mari Andersin</li> <li>• Arja Tanninen</li> <li>• Risto Paltemaa</li> <li>• Kai Hämäläinen</li> <li>• Esko Ruokola</li> </ul>
<b>II</b>	<b>MANAGEMENT SYSTEM OF THE REGULATORY BODY ORGANIZATION OF THE REGULATORY BODY</b>	<ul style="list-style-type: none"> <li>• Frederic Bernier</li> <li>• Peter Lietava</li> <li>• Geraldine Dandrieux</li> <li>• Juraj Homola</li> </ul>	<ul style="list-style-type: none"> <li>• Risto Paltemaa</li> <li>• Airi Kannisto</li> <li>• Kaisa-Leena Hutri</li> <li>• Rainer Laaksonen</li> </ul>
<b>III</b>	<b>AUTHORIZATION PROCESS AND REQUIREMENTS ON THE APPLICANT(S)/LICENSEE(S)</b>	<ul style="list-style-type: none"> <li>• István Végvári</li> <li>• Alexandru Rodna</li> <li>• Bengt Hedberg</li> <li>• Hans Wanner</li> </ul>	<ul style="list-style-type: none"> <li>• Jussi Heinonen</li> <li>• Petri Jussila</li> <li>• Airi Kannisto</li> </ul>

Tem	Subject Area	Mission Experts	Lead Counterparts
IV	<p style="text-align: center;"><b>REVIEW AND ASSESSMENT PROCEDURES</b></p>	<ul style="list-style-type: none"> <li>• Frederic Bernier</li> <li>• Peter Lietava</li> <li>• Bengt Hedberg</li> <li>• Frans Boydon</li> </ul>	<ul style="list-style-type: none"> <li>• Arto Isolankila</li> <li>• Ari Luukkonen</li> <li>• Esko Eloranta</li> <li>• Paula Ruotsalainen</li> <li>• Marko Alenius</li> <li>• Tero Varjoranta</li> </ul>
V	<p style="text-align: center;"><b>INSPECTION AND ENFORCEMENT</b></p>	<ul style="list-style-type: none"> <li>• Alexandru Rodna</li> <li>• Darius Lukauskas</li> <li>• Wolfgang Hilden</li> <li>• Frans Boydon</li> </ul>	<ul style="list-style-type: none"> <li>• Jussi Heinonen</li> <li>• Katriina Labbas</li> <li>• Kai Jakobsson</li> <li>• Henri Niittymäki</li> <li>• Arto Isolankila</li> </ul>
VI	<p style="text-align: center;"><b>STAKEHOLDER RELATIONSHIP, PUBLIC INVOLVEMENT</b></p>	<ul style="list-style-type: none"> <li>• István Végvári</li> <li>• Hans Wanner</li> <li>• Bengt Hedberg</li> </ul>	<ul style="list-style-type: none"> <li>• Risto Isaksson</li> <li>• Tero Varjoranta</li> </ul>