IAEA-EBP-LTO-30
140606

EXTRABUDGETARY PROGRAMME ON SAFETY ASPECTS OF LONG TERM OPERATION OF WATER MODERATED REACTORS

MINUTES OF THE PROGRAMME'S FOURTH STEERING COMMITTEE MEETING

23-25 January 2006

INTERNATIONAL ATOMIC ENERGY AGENCY

1. INTRODUCTION

The number of Member States giving high priority to extending the operation of nuclear power plants beyond their initial license is increasing. Decisions on long term operation (LTO) involve the consideration of a number of factors. While many of these decisions concern economic viability, all are grounded in the premise of maintaining plant safety. The IAEA recognized this new industry initiative; therefore, in the 1990's, it developed comprehensive generic guidance on how to manage the safety aspects of physical ageing. It was recognized, however, that internationally agreed-upon, comprehensive guidance was needed to assist regulators and operators in dealing with the unique challenges associated with the LTO issue.

In response, the IAEA initiated this Extrabudgetary Programme (Programme) on Safety aspects of long term operation of water moderated reactors (original title was Safety aspects of long term operation of pressurized water reactors). The Programme's objective is to establish recommendations on the scope and content of activities to ensure safe long term operation of water moderated reactors. The Programme should assist regulators and operators of water moderated reactors in ensuring that the required safety level of their plants is maintained during long term operation, should provide generic tools to support the identification of safety criteria and practices at the national level applicable to LTO, and should provide a forum in which MS can freely exchange information.

The Programme activities are guided by the Programme Steering Committee (SC), follow the overall SC Programme Workplan and SC Terms of Reference, [1], and are implemented in 4 Working Groups (WG). The WGs focus on:

- general LTO framework (WG 1);
- mechanical components and materials (WG 2);
- electrical components and I&C (WG 3);
- structures and structural components (WG 4).

Further detailed information on the Programme could be found at: http://www-ns.iaea.org/nusafe/s_projects/salto_int.htm .

The purpose of the fourth Steering Committee Meeting, held at the IAEA Headquarters in Vienna, Austria, 23-25 January 2006, was to review the progress of the Programme. Specifically, the Steering Committee comments were requested on the work completed by the four Working Groups and guidance on the contents, and on the preparation of the Programme Final Report.

The Agenda for the Meeting is provided in Appendix I. The Meeting was attended by nominated representatives of the participating Member States (MS), the European Commission and WG leaders/secretaries. List of participants is provided in Appendix II.

In order to unify preparation of the Programme Final Report and the Final Working Group Reports, an additional co-ordination meeting of WG leaders/secretaries was held 26 –27 January 2006.

2. MEETING SUMMARY

Mr. Taniguchi, Deputy Director General, Department of Nuclear Safety and Security (NS) of the IAEA, opened the Meeting. In his opening remarks Mr. Taniguchi reviewed the objective and current status of the EBP:

- The EBP is entering the final phase and is formulating and discussing the outcomes of the working groups and the EBP Final Report. The results of the EBP would be used as a basis for future Agency LTO activities and as a reference for MS concerning this important issue. Development of a Safety Guide on Long Term Operation has been initiated (in coordination with the Safety Guide on Ageing Management); their publication is scheduled for 2008.
- Average age of the operating NPPs in MS is constantly increasing and, in this situation, the recent conferences (Topical Issues in Nuclear Installations Safety and Operations Safety Performance in Nuclear Installations) confirm the high importance of LTO and Ageing Management to the MS operating NPPs.
- In addition, the end of this EBP is an important turning point for the Agency to develop new strategies and a systematic approach to sharing lessons learned in this area.
- Therefore the Agency is establishing a new comprehensive programme integrating all relevant aspects of LTO and Ageing Management and including Configuration Management, Design Basis Data Reconstitution, PSR, etc.

The new comprehensive programme will include the following elements:

- The Agency plans to establish a broad scope engineering safety review service with focus on LTO and Ageing Management (complementing OSART), with the main objective of exchanging experience and transfer technology, to assure and enhance the safety of operation of nuclear power plants, beyond originally anticipated time frame. This includes development of a Guideline for the new review service and for self assessments by NPPs.
- The Agency will also continue preparing a Supportive Guidance (living and user friendly) on LTO, Ageing Management, etc.
- Pilot activities will provide a basis for finalizing the Safety Guides and the Service Guidelines (need to take place in 2006 and 2007!).
- Knowledge management:
    - based on SKALTO
    - include e.g. “International Generic Ageing Lessons Learned (i-GALL)”
    - on-line information exchange tool
- Standing Advisory Group on LTO and Ageing Management (based on this SC)

In conclusion, Mr.Taniguchi stated that:

- The new comprehensive programme will have a key role in the Programme of the Department of Nuclear Safety in the coming years. The LTO and Ageing Management Project are already included in the Agency's Programme and Budget 2006-7 (but with limited resources allocated, some extrabudgetary resources are still

required). For the 2008-9 cycle and beyond up to 2011, this Project will be expanded to meet the demand from MS.

- Final meeting of this EBP in September 2006 (combined with a TM on LTO and AM) should provide input for planning of these future Agency activities in the medium to long term.
- The LTO and Ageing Management Programme is already included in the Agency's Programme and Budget 2006-7, but with limited resources allocated, and some extrabudgetary resources are still required. For the 2008-9 cycle and beyond up to 2011, this Project will be expanded to meet the demand from MS.

Mr. Taniguchi appreciated active contribution of the participating Member States to work of the SC and to all the WGs and called for continuous support from all the Member States.

Mr. Radim Havel, the Programme Scientific Secretary, summarized the Programme activities that have taken place since the third Steering Committee Meeting in April 2005. Mr. Havel stated that this SC meeting is very important and several key issues must be addressed:

- advice on finalizing the Final Working Group Reports
- advice on preparation of the Programme Final Report
- final SC and EBP meeting combined with Technical Meeting on LTO
- follow-up activities
  - new peer review service
  - pilot studies
  - training and workshops
  - mechanism for experience feedback
  - standing advisory group
  - coordinated research programme
  - information (knowledge) management

Mr. Havel also appreciated the effort of each Working Group and in particular of the leaders and secretaries.

Mr. Frank Gillespie, the SC Chairman, welcomed the participants. In his opening remarks, he thanked all the Working Groups for the excellent works. Mr. Gillespie stated that 70% work of this EBP has been done over the past three years and success achieved to some extent in development of LTO framework and identification of LTO activities as well as recognition of attributes of acceptable Ageing Management Programmes.

Mr. Gillespie further suggested that a cohesive and collective LTO framework provides a valuable skeleton for Member Sates to be able to adapt into national regulation. Member Sates can use the recommendations for guidance of LTO and application to national practices. The LTO framework also provides structure for the Agency to do future work, including but not limited to pilot studies for demonstration purpose and development of related Safety Guides.

Mr. Gillespie emphasized the common elements of degradation mechanisms regardless of manufacturers and types of reactors. He stated that the goal is to bring technical insights to bear the degradation and ensure safe long term operation through operation experience. He suggested that the coming Agency mission on license renewal and review of Scoping and Screening Process as part of TC programme at Paks NPP is the first example of practical activities, to be followed at other plants.

2.1. NATIONAL PRESENTATIONS

Each MS participating in the SCM made a brief presentation, describing the status of its efforts with regard to the LTO and its comments and suggestions to drafts of the Working Groups Final

Reports of this Programme (See appendix III).

Bulgaria

The following items were part of presentation:
– Preparation of LTO process for units 5&6 Kozloduy NPP,
– Comments on results of WGs up to date,
– Some specific comments on terms as “acceptable” Ageing Management Programs and following discussion,
– Comments on country names and reactor types.

Czech Republic

Overall information about LTO related activities current and planned was given by Czech representative with the following addressed:
– LTO activities at Dukovany NPP including ongoing three-phase programme
– Plans for Temelin NPP LTO activities which will start in 2007
– LTO activities with PSR, Risk Informed ISI and EQ programs in focus
- DB reconstitution for WWER 440 and 1000
- Expectations of SALTO results including recommendations:
    - To issue the Final Program Report (Final WG reports) as soon as possible
    - To prepare the IAEA LTO guide

Agency documents resulting from current EBP will be applied in the LTO activities and also guidance on LTO would be important document to use

Finland

Congratulated WGs on good work, but voiced concern that not all safety issues were treated. All safety issues are included and updated in Finland. EBP should have more accent on all safety-relevant issues. It was noted that this would significantly change the scope of a now three year-old programme and so it is now impossible to include it in the programme activities.
In direct discussion it was agreed to highlight the limitations of the current programme from point of view of the safety issues as referred e.g. in PSR Guide.

Hungary

Discussed information regarding current status of the Hungarian 2003 accident and LTO activities:
- Any loss of trust of the public concerning safety of Paks NPP;
- Parliament discussed service lifetime extension of the NPP with positive result (96,9%);
- Implementation of recommendations following IAEA mission with support by US NRC and Rostechnadzor;
- State of the work with post-accident activities in Unit 2
- Preparatory actions of lifetime extension by Paks NPP
- Outstanding importance of the LTO subject in Hungary
- Hungary supports the EBP SALTO and considers use the outcomes in process of Paks NPP lifetime extension programme
- Specific comments were given to draft of Final Working Group Reports and to WG1 report especially (see Appendix III)

The Netherlands

Joined in WG 1 work and have reviewed all draft reports completed so far.
- The Netherlands representative suggested removal of country names in FWGRs.
- One NPP exists in the country and would like to have a 60 years operational lifetime. The Utility and regulator are expecting guidance and a general framework for LTO.
- It is suggested that the IAEA documents on Aging Management would be made more consistent. Also combination of AM and LTO would be useful.

Finally suggestion was given to involve external experts for Final Programme Report preparation and review process.

Russia
Extreme usefulness of the EBP has been demonstrated for generalization, reviewing and transfer of international experience relevant to NPP long term operation.
The RF has extended operation on 9 units so far, this work involved integrated engineering review, aging assessment, feasibility study for LTO, and full scope of grade (equipment condition). This work has been reported on previous SCM.
Recommendation on WG reports –
1) no country specific examples,
2) quality of report is main issue,
3) the LTO definition needs work,
4) extend the examples of MS rather than use of term "European and US",
5) License renewal term is for 5 years rather than the stated 15 years.

Slovak Republic
Presented information about current status of legal framework for nuclear power, situation concerning operation of Bohunice NPP was given (unit 1 will be shut down for decommissioning by the end of 2006).

Recommendations were provided to WG reports as follows:
– To add: Personnel plan should consider a training of personnel and knowledge preservation aspects related to LTO.
– To add: Decision for LTO should be made in an early stage of the plant operation.– To includedefinition of Mitigation Measures in the glossary.
– To include Post Maintenance Testing– To add advantage of a destructive testing of removed cables.

Sweden
Information about status of work in the field of LTO in Sweden was given and main parts of the presentation were:

– Overall regulatory approach to LTO–"Modernization due to ageing"
-. Management of safety in connection to power uprate and new regulations on design and construction of NPPs in Sweden
– Ambitious plans from utilities to increase power at almost all units of Swedish NPPs.

Sweden supports EBP SALTO as an important activity for further LTO development

USA
License renewal experience in U.S.A. was presented:
– Wide range of license renewal and experience presented.
– Revision of license renewal guidance documents
– Improvement of review process
– License Renewal Lessons learned in ageing management similarities, standardization, clear requirement and guidance as well as on-site review.
– Recommendations were given to IAEA on LTO future activities:
  - IAEA document, analyze, and share with MS operating experience and research results related to aging
  - IAEA coordinates assistance to MS in establishing and implementing aging management for LTO

European Union
The European Commission representative stated that the participation of the EC experts in the EBP provides information and views of all 25 EU Member States.

2.2. WORKING GROUPS' PRESENTATIONS

The WG Leader/secretaries made presentation on Final Working Group Reports (FWGRs). There were some comments on specific items of each draft FWGR, the reporters suggested solutions to comments made by SC through national presentations.

Working Group 1 – Mr. Kriz *(WG1 secretary)*
Mr. Kriz briefly reviewed the activities for Working Group 1 which is focused on LTO regulatory aspects. Beyond definition of LTO there were following items in presentation describing contents or addressing recommendations of the Final Working Group Report:

- Laws and Regulations
- Current Licensing Basis
- Upgrading of Design Basis Requirements incl. PSR
- Considerations given to or Activities Planned or taken for LTO
- Available research results and operating experience

Also response was given to specific comments arising from national presentations

Working Group 2 – Mr. Taylor *(WG 2 secretary)*
Mr. Taylor presented summary of the final report by sections and pointed out the challenges and recommendations resulting from WG activities. Some of the recommendations were especially pointed out such as risk informed approach in ISI, surveillance specimens programme for RPV and usefulness of pilot studies for various NPP design. Further suggestions and comments given by SC members in national presentations were thoroughly discussed and solution proposed.

Working Group 3 – Mr. Duchac *(WG 3 Leader)*
Mr. Duchac have a formal presentation as the other Group Leaders and provided description of WG3 report history and objectives and scope of WG3 activities including structure of the final report. In recommendations given by the WG was stressed on needs of development of minimum criteria for ageing, functional testing, replacement in connection to EQ. Pilot studies and technical exchange to share information were also part of the recommendation presented. MS comments resolution was the final part of the presentation.

Working Group 4 – Mr. Auluck *(WG 4 Secretary)*
Mr. Auluck also briefly discussed the schedule of WG 4 activities and pointed out good coordination and communication between Agency and WG leaders. Work of WG4 was partly different by character as given by specific features. Information was presented about the final report concept and results. In addition to recommendations similar to the other WGs concerning pilot studies, there were proposed CRP efforts in the field of civil SSC and cooperation and information exchange on the international level.

SC members were encouraged to continue commenting on Final Working Group Reports until 5 February 2006, following excellent examples of comments by Bulgaria, Russia, and Slovak Republic. Following format for comments was suggested:

- Identify Text that creates Issue:
- State Reason for Issue:
- State Proposed Solution:

Potential action items and conclusions resulting from discussion on WGFR were:

- Add a glossary of terms that is consistent with other IAEA reports.
- Outcome of the programme is:
    - Four free-standing Working Group Reports
    - Final Programme Report to be produced as close as possible in Safety Guide format

Finally time schedule below was agreed to be followed for WGFR completion.

Schedule for completing the SALTO programme Final Working Group Reports.

Activity	***Proposed Date***
Comments of SC in writing	5 February 2006
Completion of FWGRs	28 February 2006
Editing	March 2006
Glossary	20 February 2006

(Definition of LTO, cross check with IAEA ageing management glossary)

2.3. PROGRAMME FINAL REPORT

Mr. Havel gave comments on scope, format and structure of the contents of the Programme Final Report (PFR) and the main objectives.

The Programme Final Report should have attributes of Safety Standards to simplify use of the results in the MS and in further Agency LTO. The Final Working Group Reports should be issued as separate technical reports. Proposed time schedule for SALTO Programme Final Report (below) was presented and discussed. Finally WG leaders and secretaries agreed to draft and review the PFR activities (refer to IAEA Safety Standard NS-G-12 for LTO Safety Guide format & content in drafting of PFR).

Schedule for completing the SALTO Programme Final report, agreed to by Steering Committee January 25, 2006.

Activity	***Proposed Date***
Completion of an Initial Draft	March 27, 2006
Distribution of the Initial Draft to all WG Leaders & Secretaries & Scientific Secretary	March 27, 2006
Deadline to Receive Edits from WG Leaders & Secretaries & IAEA	April 12, 2006
Preparation of Resolution to Comments	April 13 to May 5, 2006
FPR Review Meeting	May 9 to 11, 2006 or May 23 to 25, 2006
Deadline to submit Draft to Steering Committee Scientific Secretary	June 1, 2006
Draft FPR to be submitted to Steering Committee Members	June 10, 2006
Comments from Steering Committee to be Submitted to Scientific Secretary**	June 30, 2006
Steering Committee Comments to be resolved	July 2006
Submit 2nd Draft to Scientific Secretary for Final Review	August18, 2006
Submit 2nd Draft to SC Members and SC Members Final Comments for Resolution	August 19, 2006
The Final Draft to be submitted to Scientific Secretary**	September 1, 2006
The Final Meeting (Combined with SC) Develop Commitments to Resolve all Comments	September 12 to 14, 2006
The Final Report to be submitted to Scientific Secretary	Not to exceed October 20, 2006

**To meet Schedule Expectation is that all Steering Committee Comments will be in writing.

2.4. SALTO FOLLOW-UP ACTIVITIES

Follow –up – activities 2006 – 8 – Mr. E. Liszka

Mr. Liszka presented summary of recommendations addressed to IAEA in the drafts of WGFRs. Short view of planned activities with key role of pilot studies of various plant designs was given. Also other recommended activities, such as training, data collection etc are included in the

proposed plan. Main focus in planning for 2007-8 is on development of Safety Guide on LTO.

SKALTO database, Aging management activities – Mr. T. Inagaki
Mr. Inagaki briefly described the IAEA activities related to aging management and knowledge sharing. Mr. Inagaki summarized the IAEA guidance documents available to the MS on aging management and the activity related to the development of a framework for sharing knowledge on aging management and long term operation including an interactive information exchange via LTO and AM webpage

SALTO Website – Mr. L. Wang
Mr. Wang presented the on-going work on SALTO Webpage update which aims to reflect the progress and current status of SALTO with new features of Programme overview and LTO key components. It is planned to expand the SALTO web to include all activities on AM and LTO.

(IAEA presentations -see appendix IV)

3. DISCUSSION AND ACTION ITEMS

Following the four WG presentations there was a general discussion regarding the information provided by the WGs. The following action items from discussion are applied in further work.

- WG Leaders and Secretaries should incorporate SC comments and recommendations on WG Final Reports:
    - Removal of Country references and reactor types from FWGRs text
    - Revision Definition of LTO
    - A Consistent Glossary will be added into the all Final Reports
    - Review terminology (e.g. Acceptability) and Reference Consistency with IAEA References
    - WG 2-3-4 Tables are considered as examples only
    - Recommendations
        - Technical – to be considered as part of LTO and Final WG Reports
        - Non-technical (workshop, training) – go up front as IAEA considerations in a Cover Letter addressed to DG of the Agency, to be prepared by SC upon end of SALTO.
    - Specific changes to each WG as per discussion result (largest changes to WG 1)
- Schedule for FWGRs completion has been agreed to (See section 2.2)
- WGs to refer to IAEA Safety Standard NS-G-12 for LTO Safety Guide format & content in drafting of PFR
- Larger Safety questions and Decommissioning are beyond the scope of this LTO effort – to be stated in the Introduction to the Programme Final Report
- Updated time schedule for finalization of Programme Final Report has been agreed (See section 2.3)
- Detail plan for development of the Programme Final Report to be agreed at Meeting of WG leaders and secretaries following SCM

APPENDIX I.
AGENDA
4th Steering Committee Meeting
IAEA EBP ON SAFETY ASPECTS OF LONG TERM OPERATION OF WATER MODERATED REACTORS
Room C07 IV
PROVISIONAL AGENDA

23 January		
14:00	Opening remarks Meeting objectives Chairman's address	T.Taniguchi R.Havel F.Gillespie
14:30	MS statements (max.15 minutes each)	
17:30	*Adjourn*	
19:00	*Reception*	
24 January		
	Final WG Reports presentation	
9:00	WG 1 Final Report	Z.Kriz
9:45	WG 2 Final Report	T.Taylor
10:30	*Coffee break*	
11:00	WG 3 Final Report	A.Duchac
11:45	WG 4 Final Report	R.Auluck
12:30	*Lunch*	
14:00	Discussion	All
15:30	*Coffee break*	
16:00	Finalization of WGs Final Reports-actions	All
17:30	*Adjourn*	
25 January		
9:00	Final Programme Report -discussion and actions	R.Havel F.Gillespie
10:30	*Coffee break*	
11:00	SALTO follow-up activities	E.Liszka T.Inagaki L.Wang
12:30	*Lunch*	
14:00	Discussion	All
	Open issues	F.Gillespie
	Action items	F.Gillespie
	Next SC meeting	F.Gillespie
16:30	*Adjourn*	

Working Groups' Leaders/Secretaries Co-ordination Meeting
IAEA, Vienna, 26 to 27 January 2006
Room B0625
PROVISIONAL AGENDA

26 January		
09:00	WG leaders/secretaries co-ordination	
17:30	Adjourn	
27 January		
09:00	WG leaders/secretaries co-ordination	
13:00	Adjourn	

APPENDIX II.
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Mr. L. Wang	NSNI-ESS
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APPENDIX III.
NATIONAL PRESENTATIONS

EBP on SALTO - WGs OUTCOMES

- ✓ Final WGs Draft Reports completed on time;
- ✓ Contents correspond to the Program Workplan, items adequately addressed and objectives are met;
- ✓ Focus only on LTO specific issues;
- ✓ Common elements and differences, future challenges and recommendations defined;
- ✓ Future activities as WS and TC events proposed;

Final WG 1 Draft Report

- ✓ A concise report with short and accurate summaries on common elements and differences, challenges and recommendations;
- ✓ Pre-Conditions for LTO defined;
- ✓ LTO definition;
- ✓ Scoping and screening evaluation determined;
- ✓ LTO AMP defined ("acceptable" could be omitted from the title of the definition – "Acceptable Aging Management Program");
- ✓ Table of contents missing from the file;
- ✓ A Glossary could be added;

Final WG 2 Draft Report

- ✓ A very good report with concise and accurate summaries on common elements and differences; challenges and recommendations;
- ✓ A System Summary Table for LTO developed;
- ✓ A Glossary of Terms applied;
- ✓ A Pilot Study recommended for detailed requirements and acceptance criteria – What outcomes are expected?; A detailed SSCs guidance is not only design specific but more plant specific; Is IAEA ready to finance such study?

Final WG 3 Draft Report

- ✓ A concise report with short and accurate summaries on common elements and differences; challenges and recommendations;
- ✓ Country names and country document references and requirements could be avoided;
- ✓ Propose more concise summary of common elements and differences in point 2.2;
- ✓ A System Summary Table for LTO developed;
- ✓ A Glossary of Terms applied;
- ✓ A Pilot Study recommended for detailed requirements and acceptance criteria – What outcomes are expected?; A detailed guidance is not only design specific but more plant specific; Is IAEA ready to finance such study?
- ✓ WS and TM proposed

Final WG 4 Draft Report

- ✓ The report include summaries on common elements and differences; challenges and recommendations;
- ✓ Country names and country document references and requirements should be avoided (examples);
- ✓ In the Appendices a lot of country experience examples with country specific rules and regulations – Are they all recommendations?
- ✓ A good number of appendices, some too much country specific- mainly it is the US and the Russian approach;
- ✓ A System Summary Table for LTO developed;
- ✓ WS and TM proposed

Final Program Report

- ✓ Wording should be improved and unified in all chapters;
- ✓ Glossary should be unified;
- ✓ Country names should be omitted in the main text;
- ✓ A final summarizing chapter with step-by-step activities/priorities (recommendations) for LTO or just a listing of activities could be added – the Generic Guidelines;
- ✓ A final summarizing chapter with future challenges;

Follow - up activities

- ✓ **IAEA listing of activities(2006 – 2007) presented during last WGs meetings supported;**
- ✓ **LTO should be included in the IAEA TC Program (WS and TM proposed in the WGs reports);**

IAEA SALTO

4 th Steering Committee Meeting

Miroslav Šváb
State Office for Nuclear Safety
Vienna,January 23 – 25, 2006

CONTENT

- ➔LTO Activities in the Czech Republic – current situation and plans
- ➔SALTO Results
- ➔Recommendations on future IAEA LTO Activities

LTO Activities in the CR

NPP Dukovany (EDU)

4 Units of WWER 440/213 type

Operation since 1985 Unit 1
1986 Unit 2
1986 Unit 3
1987 Unit 4

3

LTO Activities in the CR

NPP Temelin (ETE)

2 Units of WWER 1000/320 type

Operation since
2000 Unit 1
2002 Unit 2

4

LTO Activities in the CR
Dukovany NPP

➔ **Phase I**

1996 – SUJB Statement on LTO Requirements; Board of Directors of utility decision – to continue with modernisation of Dukovany with a goal to operate until at least 2025;
MORAVA program (1998 – 2009)

➔ **Phase II**
2004 – 8 Completion of Dukovany NPP LTO Program documentation
2005 – **License for further operation** (after 20 years of operation),
2008 – 15 Implementation of the Dukovany NPP LTO program
2015 **License for further operation** (after 30 years of operation)

➔ **Phase III**
2016 – Update of the Dukovany NPP LTO program

5

LTO Activities in the CR
Dukovany NPP

Phase II

2004 – 8 Completion of Dukovany NPP LTO documentation

- 2004 – 6 Technical part of the LTO program
- 2006 Economical part of the LTO program
- 2005 – 8 Finalising of other chapters of LTO Documentation

➔ **2004 – 6** SALTO activities

➔ **2007 – 8** Verification of range and content of LTO project (due to outputs of SALTO and other supporting projects)

➔ **2008 – 15** Implementation of the Dukovany NPP LTO program

➔ **2015** License for further operation issued by SUJB

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LTO Activities in the CR Temelin NPP

2007 Beginning of “Temelin NPP LTO program“
(based on Dukovany NPP program) - documentation

2010 PSR

2011 FSAR revision

2030 License for further operation

7

LTO Activities in the CR

➔**PSR** report parts submitted to SUJB
(Dukovany draft)

➔**EQ**

➔**AMP**

➔**RI ISI AND NDT QUALIFICATION**

Four RI ISI Pilot Applications started. One as the IAEA RER Project. All of them with EPRI Support.

8

LTO Activities in the CR

➔**DB RECONSTITUTION FOR WWER 440 AND 1000**

Definition of the Functional Requirements

DB Parameters

Safety Margins

➔**RISK INFORMED SAFETY CATEGORIZATION**

9

LTO Activities in the CR

EQ programs in CR

- **1st step** - verification of existing EQ program inputs and methodologies (verification of list of equipment to be qualified, environmental conditions, methodology of assessment)
- **2nd step** - establishment of formal (documented) “umbrella” EQ program by the licensee
- **3rd step** - preserving EQ (subject to regulatory oversight)

10

LTO Activities in the CR

Scope of EQ

➔**Environmental qualification**
- **Mild or harsh environment**

➔**Seismic qualification**

➔**EMC qualification**

Mechanical, electrical and I&C equipment important to safety

11

LTO Activities in the CR

➔There has been the LTO team established within the company structure (40 specialists)

➔State Office for Nuclear Safety has followed all LTO activities

➔There is good information exchange between utility and SÚJB

12

Recommendation on future IAEA LTO Activities

CR Recommendations:

1) To issue the Final Program Report (Final WG reports) as soon as possible

2) To prepare the IAEA LTO guide

Russian Federation Proposals to the EBP Steering Committee Meeting

To note that:

- The time period passed off has demonstrated the EBP's extreme usefulness for generalization, reviewing and transfer of international experience relevant to NPP long term operation.

- Working Groups 1,2,3 and 4 have performed great work towards collection, systematization and evaluation of the information and its generalization in the form of WG Final Reports.

NUCLEAR REGULATORY AUTHORITY OF THE SLOVAK REPUBLIC

STATEMENT

TO THE DRAFT FINAL WG REPORTS

ŠTEFAN ČEPČEK

SALTO STEERING COMMITTEE MEETING, VIENNA, AUSTRIA, 23-25 JANUARY 2006

NUCLEAR REGULATORY AUTHORITY OF THE SLOVAK REPUBLIC

OUTLINE

- Country information
- General statement
- Comments and Recommendations to WG Reports
- Conclusion

Country information

- Set of 13 implementing regulations to the „Atomic Law" has been approved by the EU member states
- It is expected hey will be in force since 1-st March 2006
- WENRA Reactor Harminization Group
  - Compliance of legislation with reference levels
  - Reference levels based on IAEA documents
  - Gaps in implementation of RLs in legislation identified

NUCLEAR REGULATORY AUTHORITY OF THE SLOVAK REPUBLIC

Country information

- Unit 1 of Bohunice V-1 NPP (WWER 440/230) – last refueling outage will start in April 2006
- Designed lifetime 30 years, total operation time will reach 28 years
- „Small" and „Gradual" reconstructions completed in 2001
- Privatization of Sovak Power Comopany
- Foundation of „GovCo" for the operation of V-1 NPP, decommissioning of A-1 NPP, operation of spent fuel storage facility and radwaste reprocessing facility and radwaste repository

General statement

- The drafts of Working Group Reports are elaborated in the compliance with the objectives of the SALTO project and these objectives were met
- The format and the content of each particular report is consistent and the activities of the Working Groups were well co-ordinated
- During the review of WG reports a few recommendations were proposed for a discussion and for a respective implementation

NUCLEAR REGULATORY AUTHORITY OF THE SLOVAK REPUBLIC

Comments and Recommendations to WG 1 Report

- Comment
  - Par. 4.1- there is defined scope of detailed LTO programme including the investment and personnel plan
- Recommendation
  - To add following text: Personnel plan should consider a training of personnel and knowledge preservation aspects related to LTO.

It is necessary to consider also the ageing (and retirement) of skilled qualified personnel and to ensure preservation of knowledge necessary for the LTO utilization.

Comments and Recommendations to WG 1 Report

- **Comment**
  - **Par. 4.0 - the considerations to LTO are described**

- **Recommendation**
  - **To add to the par. 4.3 following: Decision for LTO should be made in an early stage of the plant operation.**

The main objective is that adverse impacts of identified ageing mechnisms to SSCs can be adequately treated by proper mitigation measures.

NUCLEAR REGULATORY AUTHORITY OF THE SLOVAK REPUBLIC

Comments and Recommendations to WG 2 Report

- **Comment**
  - **Par. 3.1.2 - there is a definition of Ageing Mitigation Measures**

- **Recommendation**
  - **This sentence use as an agreed definition of Mitigation Measures in the glossary (page 21 and 22 of WG 1 Report)**

Importance of mitigation measures for LTO requires a common understanding of this term.

Comments and Recommendations to WG 2 Report

- **Comment**
  - **Par. 3.1.2 - there are repair and replacement used as the mitigation measures**

- **Recommendation**
  - **To delete repair and replacement from this paragraph**

In the glossary of the IAEA safety guide No. NS-G-2.6 „Maintenace, Surveillance and In-service Inspection ofNuclear Power Plants" the terms repair and replacement are understood as „the corrective maintenance".

NUCLEAR REGULATORY AUTHORITY OF THE SLOVAK REPUBLIC

Comments and Recommendations to WG 2 Report

- **Comment**
  - **Par. 3.3 – as a one of the examples for harmonization is given the Master Curve**

- **Recommendation**
  - **Providing the following IAEA document represents required harmonization, then it is possible to delete the Master Curve as the example**

The IAEA has issued „Guidelines for Application of the Master Curve Approach to Reactor Pressure Vessel Integrity in Nuclear Power Plants" Technical reports Series No. 429.

NUCLEAR REGULATORY AUTHORITY OF THE SLOVAK REPUBLIC

Comments and Recommendations to WG 2 Report

◆ **Comment**
- **Par. 4.1.4 – requirement for verification of NDE effectivness throuh blind trials**

◆ **Recommendation**
- **This issue requires harmonization of both, the methodologies and the regulatory requiremnts**

For inspection of main components and piping there are usually used very sophisticated autometed NDT equipment and software. Blind trials require very expensive test blocks. It is necessary to „optimize" a scope of blind trials if such NDT equipment are used and if they (and procedures) were qualified by open trials.

NUCLEAR REGULATORY AUTHORITY OF THE SLOVAK REPUBLIC

Comments and Recommendations to WG 2 Report

◆ **Comment**
- **Par. 4.2.2 – there is a list of common elements and differences identified in maintenance area**

◆ **Recommendation**
- **To include into this list „Post maintenance testing"**

The purpose of the post maintenance testing is to confirm wether the condition or function of SSCs after the maintenance actions are within the acceptance criteria.

Comments and Recommendations to WG 3 Report

- **Comment**
  - **Par. 4.7.4 – recommends to perform the testing using destructive methods**

- **Recommendation**
  - **This recommendation is proposed to be supplement by the advantage of a destructive testing of removed (replaced) cables, which were exposed environmentally and by the operation (power cables)**

This will give a possibility to verify the results of the surveillance cable specimens testing and to use them for database purposes.

NUCLEAR REGULATORY AUTHORITY OF THE SLOVAK REPUBLIC

Conclusions

- **All issues related to the Long Term Operatin in the Working Group Reports were adequatelly addressed**

- **Proposals for discussion at the Steering Committee Meeting are recommended**

SALTO January 2006

Steering Committee Meeting in Vienna

Staffan Forsberg, SKI
Swedish Nuclear Power Inspectorate

Maintaining Safety is a Continuous Process of Modernisation

Licensee continuously analyse safety and take actions if deficiencies are discovered

- Licensee has to conduct an active safety work, perform safety analysis using modern analytical tools.
- Assess deviations and establish a program for safety upgrading.

SKI:s regulations

Licensee has to maintain and develop safety.

The main focus in application of SKI's regulatory strategy

Is on how the licensee fulfil his obligations by

- defining safety goals;
- develop and implement effective organisations and efficient processes for maintaining safety as circumstances change;
- carry out all necessary self-assessments.

The overall SKI regulatory approach to ageing

Regulations with safety goals based on state-of -the-art in all important areas

- and that include both technical, organisational and administrative requirements.

Inspection and supervision

- which focus on the licensees competence and resources to identify important ageing issues and to perform necessary measures.

Investigation and research

- to support SKI's inspection and supervision activities and to keep the regulations up-to date.

MODERNISATION DUE TO ”AGING”

- **Physical ageing**
  - of systems, structures, passive and active components (SSC).
- **Technology ageing**
  - of instrumentation and control systems.
- **Requirement ageing**
  - different requirements for different plant generations.
- **Safety analysis and documentation ageing**
  - safety analysis not always updated and based on new knowledge.
- **Personnel and management ageing**
  - by e.g. generation shifts and changes of attitudes.

The approach for physical ageing

- Requirements in SKI’s regulations (SKIFS 2004:1, SKIFS 2000:2) on in-service inspections (ISI), in-service testing (IST) and maintenance;
- systematic evaluation of failures and indications of generic ageing problems - in Swedish plants as well as in other similar plants;
- reporting of failures and indications of generic ageing problems;
- inspection and supervision to monitor the licensees ISI, IST and maintenance activities.

To support SKI’s regulation and supervision

- Data bases which include failures and incidents, and with all reported in-service induced degradation in Swedish NPPs.
- SKI finance degradation and ISI related research.

The approach for requirement ageing

- The Swedish NPPs were designed and build late 60´s to early 80´s to different safety standards and requirements.
- SKI's general safety regulation has been complemented with requirement for safety upgrading, SKIFS 2004:2, regulations for Design and Construction of NPP.
- IAEA Design Standards has been one of the basis for this new regulation.
- These requirements became effective 2005 with a reasonable transition period, and will lead to extensive modernisation programmes over the coming years.

The approach for safety analysis and documentation ageing

In order to fulfil SKI's requirements of Safety Analysis Reports (SAR) that are up-to-date

- All generations of BWR's and the PWR's have re-assessed the plants safety analysis, produced more complete design specifications and performed many verifications.

SKI has followed the licensees work and assessed the results on a sample basis.

The approach for personnel and management ageing

According to SKIFS 2004:1 the licensee has to secure that

- **enough personnel with necessary competence are available;**
- **responsibilities has been defined and are documented;**
- **the personnel have working conditions needed to perform their tasks in a safe way.**

During the last years SKI has systematically assessed the licensees activities to fulfil these requirements.

Maintain and Improve Safety

The nuclear regulation

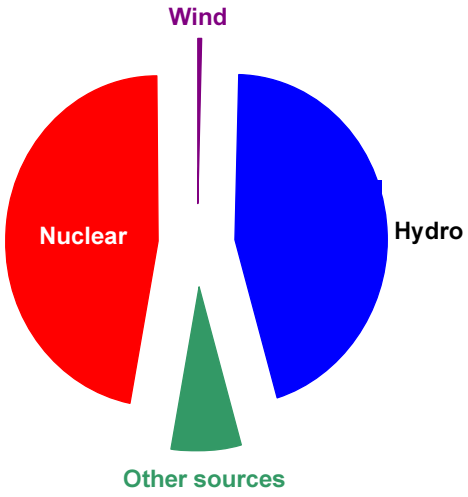
- Licensee has to ensure that all measures are taken that are needed for maintaining safety correct deficiencies in safety, discovered through improved analyses or knowledge.

The new regulation requirement

- Based on latest IAEA safety requirements.
- Reflects an increased ambition in safety.
- Formalize existing modern safety practise.

A modern safety standard for existing reactors

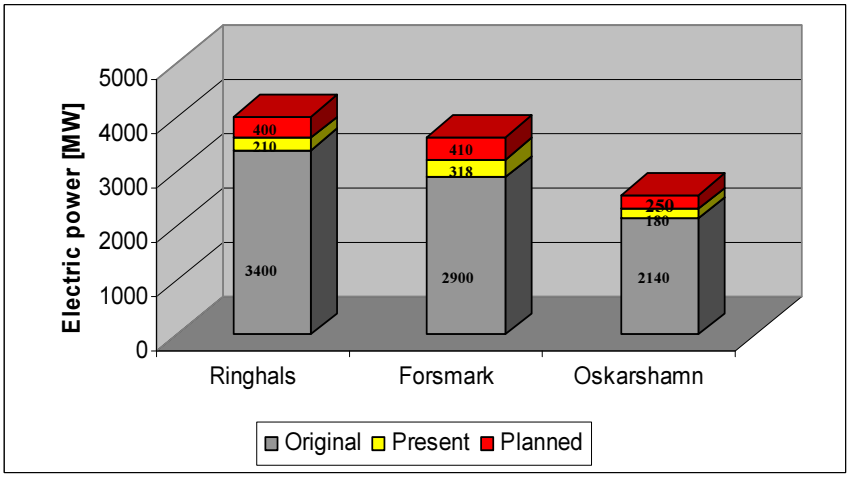
Average electrical production i Sweden



Planned power uprates in Sweden

Plant name/unit	Previous power increase (%)	Planned power increase (%)	Date for application	Date for application of trial operation	
Forsmark 1	8,0	12	Sept 2005	Jan 2008	
Forsmark 2	8,0	12	Sept 2005	Jan 2008	
Forsmark 3	9,3	15	Sept 2005	Dec 2009	
Oskarshamn 3	9,3	19,9	Oct 2004	June 2007	
Ringhals 1	10,1	1,6	March 2004	March 2006	
Ringhals 3 (1)	-	8	March 2004	Dec 2005	
Ringhals 3 (2)	-	5,5	March 2004	March 2007	
Ringhals 4	-	13,5	April 2007	2011	

Power uprates in Swedish reactors



U.S. LICENSE RENEWAL EXPERIENCE

IAEA EBP on Safety Aspects of Long Term Operation of Water Moderated Reactors
4th Steering Committee Meeting
Vienna, Austria
January 23 – 25, 2006

Stephen T. Hoffman, USNRC

U.S. License Renewal Status

- Total U.S. operating licenses - 104
- Renewed licenses issued – 39
- License renewals under review – 12
- Expect 4 – 6 applications per year

Revised License Renewal Guidance Documents

September - October 2005

- Regulatory Guide, RG-1.188, Format and Content, Rev. 1
  - NEI 95-10, Industry Guidelines for Implementing the Requirements of 10 CFR Part 54, Rev. 6
- Standard Review Plan, NUREG-1800, Rev. 1
- Generic Aging Lessons Learned (GALL), NUREG-1801, Rev. 1
- Resolution of public comments, NUREG-1832
- Technical bases document for SRP/GALL revisions, NUREG-1833

Revised License Renewal Guidance Documents

- Reflect experience gained from past reviews
- Incorporate the audit review process
- Improve guidance on conducting aging management reviews
- Standardize aging management review parameters in GALL report

Improved Review Process

- Efficiencies through standardization
- Multi-discipline onsite audit teams
- Assess approximately 90% of aging management reviews
- Reviews based on GALL Report and previously approved programs
- Review efficiencies

License Renewal Lessons Learned

- Aging management similarities
- Standardize
- Clear requirements and guidance
- On-site reviews

Future SALTO Activities

- IAEA document, analyze, and share with MS operating experience and research results related to aging
- IAEA coordinate assistance to MS in establishing and implementing aging management for LTO

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APPENDIX VI.
IAEA PRESENTATIONS

SALTO Follow-up Activities

E.Liszka
NSNI-ESS

SCM, January 2006

IAEA
International Atomic Energy Agency

SALTO Follow–up Activities

- **SALTO outlines/recommendations**
- **Priorities for further work**
- **Areas for future IAEA activities**

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SALTO Follow–up Activities

Recommendations - Summary

	WG 1	WG 2	WG 3	WG 4
Development of Guides, Standards, Evaluation Criteria	1	5	2	3
Technical Meetings, Topical Workshops, Training		5	1	2
CRP on LTO aspects		1	1	3
Pilot Studies and LTO Engineering Services	1	1	1	2
Experience and information exchange (database)	3	1	1	4

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SALTO Follow–up Activities

Safety Guide on LTO

2006

- 1st Draft - 3rd Q
- TM to comment 1st Draft - 3rd Q
- 2nd Draft – 4th Q

- Standing Advisory Group on LTO and Ageing Management (based on this SC)

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SALTO Follow–up Activities

Safety Guide on LTO

2007

- Approval on Draft by the SC – 1st Q
- Approval by the CSS for submission to MS – 1-2nd Q
- Draft submission to MS for comments – 1–2nd Q
- Revision of Draft (comments by the MS) – 3-4th Q
- Approval on the revised Draft by the SC – 4th Q

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SALTO Follow–up Activities

Safety Guide on LTO

2008

- Submission to Publication Committee for approval – 1-2nd Q
- Approval by NUSCC for submission to CSS, editing – 1-2nd Q
- Endorsment by CSS – 2nd Q
- Submission to Publication Committee – 2nd Q
- Target publication date for LTO Safety Guide– 3rd Q

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SALTO Follow–up Activities

Pilot Studies and LTO Engineering Services

- Pilot review/studies of applications of Scoping and Screening process, TLAA, including all preconditions of LTO
- Pilot studies should cover all the typical designs of LWR, references for finalizing Safety Guides and development of supportive guidance
- Preparation General Guidelines for LTO Engineering Services

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SALTO Follow–up Activities

Pilot Studies and LTO Engineering Services

2006

- Pilot review of Scoping and Screening process within IAEA TC programme HUN/4/014 –mission to Paks NPP
  - Mission scheduled for April
- Preparation of LTO Workshop and Mission to Ukraine as part of IAEA TC programme UKR/4/013
  - Plan proposal and approval by couterpart – 1st Q
  - Team recruitment and mission manual preparation – 3-4th Q
- Under discussion - mission to PWR in U.S.(team of observers)
  - Join NRC mision to a PWR unit ongoing licensing renewal -3rd Q

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SALTO Follow–up Activities

Pilot Studies and LTO Engineering Services

2007

- LTO Workshop and Mission to Ukraine (prelim. WWER-1000, South Ukraine NPP)
  - Two week's mission – 2nd Q
- Conduct a Pilot Mission to a BWR ?
  - Preparatory activities, establishment of contact with counterpart, guidelines preparation - 1st Q
  - Team composition and mission plan preparation -2nd Q
  - Mission realization – 3- 4 th Q
- Next mission preparation – (PWR,WWER,BWR - ?) – 3- 4th Q

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SALTO Follow–up Activities

Technical Meetings, Topical Workshops,

2006

- SALTO Final Meeting followed by Technical Meeting – 3rd Q (September)
  - SALTO SCM + all WGs members – Presentation of the Final Report
  - Technical Meeting on AMP+ LTO

2007

- Technical Meeting / Workshop on LTO – experiences from pilot studies, LTO/power uprate projects – 3rd Q

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SALTO Follow–up Activities

Experience and information exchange

Next Presentation – SKALTO , Ageing Management

Next Presentation – SALTO website

Modification- LTO and AM website at NSNI web

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LTO activities

Areas for future IAEA activities

(for 2008-9 up to 2011)

- **Establish a broad engineering safety review service with focus on LTO and Ageing Management with main objectives to exchange experience and technology transfer**
- **To assure and enhance safety of NPP's LTO, include safety evaluation approach into the new LTO service, develop Guidelines for the new service and for self assessments by NPPs**
- **Supportive Guidance on LTO (Scoping and Screening, TLAA)**

IAEA

SALTO Web Update and Development

L.Wang
NSNI-ESS

SCM, January 2006

IAEA
International Atomic Energy Agency

Update & Development

- Membership
- Minutes and Reports
- Implementation (Initiation and Overview)
- Key Components
- QA Manual
- SC Implementation (Draft PFR structure)
- LTO Scoping & Screening Process
- Long Term Operation and Ageing Management (NSNI Webpage)

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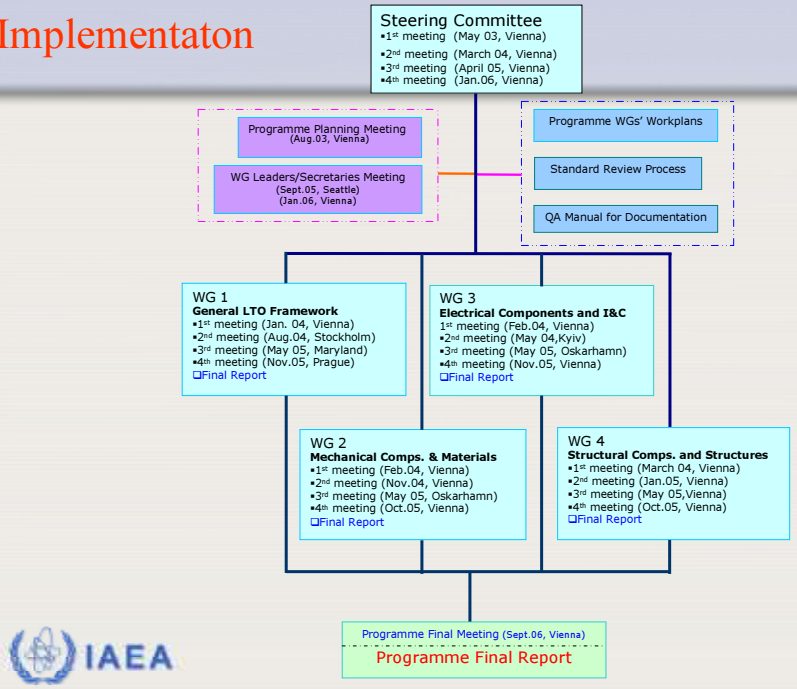
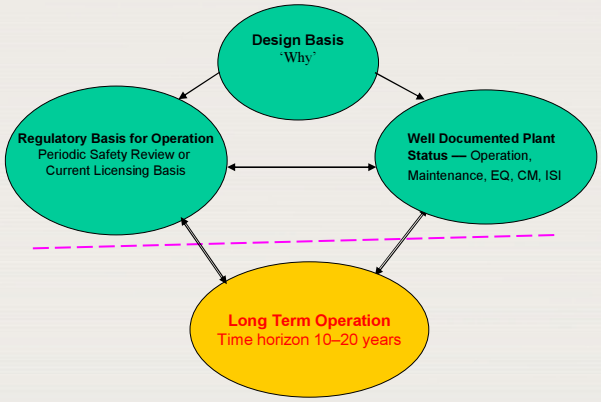
Implementaton



Key Components

Interaction of design basis management, periodic safety review (or current licensing basis), configuration management.



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