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

MINUTES OF THE PROGRAMME'S WORKING GROUP 4 SECOND MEETING

17-19 January 2005
IAEA, Vienna, Austria

INTERNATIONAL ATOMIC ENERGY AGENCY

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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, and, in particular WWERs, 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, [1,2], 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 2nd meeting of WG 4 was held at the IAEA in Vienna, 17-19 January, 2005. The objectives of the 2nd meeting of WG 4 were the following:

- Review the Input from Country Information Reports (CIRs);
- Review the IAEA draft report – IAEA-EBP-LTO-03: SRP Rev.1 (which includes a new section on the review process);
- Assign review action items (develop/agree review plan).

The Agenda for the Meeting is provided in Appendix I. The list of participants is provided in Appendix II.

2. MEETING SUMMARY

The meeting was opened by Mr. Paolo Contri, Scientific Secretary for WG 4, and Mr. Radim Havel, the Programme Scientific Secretary, who outlined the objectives and history of the IAEA Extrabudgetary Programme "Safety Aspects of Long Term Operation of Pressurized Water Reactors". The Chairmanship was then turned over to Mr. Katona, the WG 4 Chairman, who clarified the meeting agenda and way of conduct.

The meeting started with a series of presentations by each country that summarized the information contained in the Country Information Reports (CIRs) and provided a first group of comments to the LTO-03 document [3] and proposed a course of action for the Task 2 of the project to be started immediately after the meeting.

2.1. IAEA and national presentations

Mr. Contri summarized objectives and scope of the activity of the WG, in the framework of the overall project objectives, of the working group achievements, updated the project schedule and identified the specific objectives of the meeting (namely, review the CIRs, comment the LTO-03 and define the Task 2 course of actions). Mr. Contri provided a detailed preliminary review of the CIRs, carried out in cooperation wit the representative of the EC, Mr.Rieg. A precise course of action for Task 2 was suggested, which includes a review of the CIRs in order to make their review more efficient and more focused to the final project outcome expected by 2006.

In particular, it was noted that there is a large difference among the CIRs: one of the main reasons is that the national programmes follow different approaches to LTO, being intrinsically dependent on the national regulatory framework, technical tradition and also age of their nuclear fleet. The presentation identified the technical aspects more directly affecting the decision for a long-term safe operation of a nuclear facility, independently from their licensing framework. These aspects/issues should be addressed in detail in the CIR review.
Despite of the effort spent by the Country representative, it was also noted that some issues are not well covered by the CIRs, namely: the LTO scooping process, the selection of the LTO relevant degradation mechanisms, the acceptance criteria for the ageing mechanism, etc. Therefore a list of "irrevocable issues" was provided for discussion at the meeting and for the CIR improvement.

The meeting continued with the presentation of the national approaches to long-term operation. The summaries of the national presentations are provided next, the complete presentation handouts are provided in Appendix III.

Bulgaria (S. Danailov)

A summary of the Bulgarian CIR was provided. The main issues are summarised in the following:

1. Applicable laws specific to structures and structural components for long term operation.
There are no specific laws, referring to long-term operation of pressurized water reactors (PWR).

2. Regulatory requirements applicable to LTO.
There are no specific regulating normative documents, referring to long-term operation of PWR

2.1. Criteria for items selection in the scope of structures and structural components (SSC) in the LTO program.
Because of the lack of specific regulatory normative documents, there are no special criteria for selection of items within the LTO program. Following the established practice three categories of buildings and facilities are subject of continuous monitoring of their status:

- Category 1: All safety-related SSC.
- Category 2: All non-safety related SSC whose failure could prevent satisfactory accomplishment of, or initiate challenges to, any of the safety functions defined in point 1.
- Category 3: Other areas dedicated to a specific functional purpose that may be essential to the safe plant operation.

2.2. Ageing management program – organizational, management issues and interfaces with other plant processes.

2.2.1. Units 3 and 4 Rest Lifetime Assessment:

Modernization Program:
- Ageing Management Program;
- Internal Life Time Assurance Program.

2.2.2. Management of the Hydro technical Facilities Rest Lifetime.

Program for the necessary remedial and rehabilitation activities is in progress.

2.2.3. Unit 5 and 6 Rest Lifetime Assessment:

- Large-scope modernization program is in progress.

3. Operational Approaches Applicable to LTO.

3.1. Reference Degradation Mechanisms. Mechanisms, which are life limiting and particularly important for the LTO, their effects and locations.

3.1.1. Anti-corrosion protection (ACP) damage and development of corrosion on steel components.

3.1.2. Damage of concrete coating and development of corrosion on steel reinforcement.

3.1.3. Formation and development of cracks on reinforced-concrete components.

3.1.4. Uneven deformations (settlement) of building construction and their consequences – damages of nodes and connections, local overloading of given elements, cracking.

3.1.5. Destruction in the deformation gaps area.

3.1.6. Other specific cases of ageing and destruction:

- Loss of stressed force and rupture of tendons from the Prestressing containment system for Units 5 and 6;
- Inappropriate designer's solutions and components, being a precursor for water and humidity retaining, which on its turn leads to accelerated development of corrosion and even to partial destruction.

3.2. Monitoring, surveillance and inspections. In-serve inspections and periodical test practices /integrity, leak tightness, etc. .

3.2.1. Periodic control.

3.2.2. Normative base.

3.2.3. Procedures for visual control of buildings and facilities.

The existing defects are divided into three categories according to their impact on the structure:

A. Directly dangerous for the civil structure:

This category includes defects that actually decrease the bearing capacity of the structure and influence its safety and functions.

B. Potentially dangerous for the civil structure:

This category includes defects whose further progress may influence the safety and normal building or facility operation.

C. Not dangerous for the civil structure:

This category includes defects, whose further progress doesn't endanger the safety and normal operation of the building or facility. In spite of that these defects may impact the equipment normal operation, personnel life and health or damage site architecture and hygiene.

3.3. HTF Monitoring Procedures.

3.4. Displacements Monitoring Procedures /Geodesic control/.

3.5. Special Control:

- Control of Containments Stress-strain State /SSS/.

- Control of cracks opening.

3.6. Incident Control.

3.7. Documentation and Interpretation of Monitoring Results.
Special passports for the building sites of Kozloduy NPP are created, maintained and updated in Hydro technical facilities and Civil structures Department.

3.8. Maintenance practices – ageing mitigation measures and repair technology.
Measures for treatment of found out and classified defects on CS can be directed to:

- Control strengthening and optimization;
- Repair works on defect elimination;
- Investigation and/or detail design of further corrective activities;
- Organization measures.

3.9. Assessment techniques for existing structures. Trend analysis and evaluation of safety margin. Practices used to control design basis.

- Analytical research of structure;
- Full-scale study;
- Expert evaluations;
- Activities for periodic monitoring of civil structure.

Following the established practice, a given civil structure is assessed as reliable and can be operated for its purpose when:

- Geodesic control results (average regular subsidence and irregular deformations) are within the admissible limits, determined for the corresponding type of construction according to the civil norms if there aren't special requirements for a given structure;
- Group A defects have not been found out (directly dangerous for CS) and for found out group B defects (potentially dangerous for CS) single adequate measures for their treatment have been defined;
- No remarks by the operational personnel of the building or facility;
- Significant modifications of status have not been made since the last positive assessment.

Inspection for defining Units 3 and 4 residual lifetime has been done. The results show that there are not any general problems, which can affect these units operation till the expected 30 years operation. For a bigger part of the significant components was proved, that they can be operated considerably longer without any important interference. Measures have been developed as a result of this inspection, ensuring 30, 35 and 40 years of operation of these units.

Based on the given recommendations and specified measures, a program for Units 3 and 4 lifetime assurance was established, and it includes activities for assuring units safe operation and components of the units systems till the expiry of their design lifetime of 30 years. Item 7 of the program refers to civil structures and specific activities for treatment of more important defects are envisaged in it. If necessary, a similar program for assurance units' lifetime longer than design one – for example 35 or 40 years can be easily established and implemented.

4. Compilation of a list of reference documents from which the above information was collected.
   Not applicable.

Ideas and intentions for improvement of the CIR:

1. We intend to include in our CIR a description of the used procedure for rest lifetime assessment of the building and facilities.

2. We will provide a completed table form for the LTO-relevant degradations mechanisms.

Czech Republic (J. Maly)

Brief information was provided at the WG-meeting on the development of the national report (CIR). The part concerning laws, standards and technical procedures for long-term operation comprises only a short overview of documents relating directly to structures and buildings. It could be stated that the State Office for Nuclear Safety did not issue any decree relating to long term operation. On the other side there is a set of methodologies, procedures and technological procedures at the level of NPPs operators (Temelin and Dukovany), which define requirements from the point of view of long-term operation. In addition there is a set of procedures for operations, which are essential for successful extension of operation beyond the framework of originally planed plant lifetime. (Ageing Management, Maintenance, Surveillance and in-service inspections).

Currently codification of procedures for Temelin and Dukovany NPPs is under way and the new management structure is under development. Newly issued procedures are based on procedures, technical documentation and recommendations provided by the IAEA.
In addition, these parts of the national report were introduced, which describe criteria of buildings and structures selection for LTO (long term operation), Ageing Management Program and Maintenance Program.

Overview of observed degrading mechanisms as well as current condition monitoring are processed in form of tables for each individual building. Repair of the cooling tower shell in the Dukovany NPP serves as an example.

In addition the national report provides methods for assessment of existing structures.

Other part of presentation involved comments on document “Program QA Manual for Document Handling” and document “Standard Review Process”. Here the difficulties on the use of the WEB FTP sites were mentioned making the mutual communication among the working group members difficult.

In order to ensure mutual compatibility of CIRs and to make the review process easier it was decided after discussion to complete some data. Namely, there will be added new paragraphs to all chapters with proposals of safety issues where additional development will be necessary or with recommendations for regulatory and operational approaches. Czech Republic is ready to make all necessary improvements of CIR up to the end of February 2005.

Hungary (T. Katona)

The Hungarian CIR WG 4 was explained in the presentation. The Hungarian regulation relevant to safety of LTO was presented. Attention was made on the specific requirements related to the civil structures. These regulations define the scope of SSC relevant for license renewal and also the scope of life-cycle management. The licensee activities for ensuring the safety of LTO with respect to the civil structures are also generally defined in the regulations. The licensee programmes were developed taking into account the domestic regulations, the operational and maintenance experience, the international, mainly US practice.

The Hungarian practice for maintaining the safety of LTO of civil structures and structural elements was illustrated by series of examples.

The Hungarian opinion in relation to the LTO-03 Rev.1 was summarized in the presentation. The revised guideline is generally applicable for the review. However the safety factor concept is considered more appropriate for the overall assessment of safety rather than for the judgment on the particular aspects of safety of LTO of civil structures.

The potential areas for improvement of the CIR were indicated in the presentation too. Some information might be added to the CIR in relation of buried structures and supports. The assessment methodologies and criteria have to be indicated. It seems to be reasonable to present the M/ISI/S and AM practice in a summary table. The relation of LR, PSR and FSAR with respect to the safety of LTO of civil structures might be described also.

A proposal for the management of the WG 4 activities in 2005 was highlighted in the presentation too.

Two specific software systems were demonstrated at the WG 4 meeting. One is used for the management of ageing of most important SSCs, which requires very detailed and sophisticated AM. The other is used for the AM of commodity groups. These software systems are applicable for the development of the list of relevant SSCs, they manage the database of the SSCs, including information on the degradation mechanisms and locations, database of ISI/M/S findings and relevant background documentation. These software systems are powerful tools for the AM of SSC.

Russian Federation (E. Zakharov and N. Korobov)

The Country Report of the Russian Federation was prepared on the basis of existing experience of lifetime extension for 4 power units with different reactor types, namely:

- Novovoronezh NPP Unit 3 (WWER-440);
- Novovoronezh NPP Unit 4 (WWER-440);
- Kola NPP Unit 1 (WWER-440);
- Leningrad NPP Unit 1 (RBMK-1000).

Moreover, there are used materials relevant to lifetime extension application from the following NPPs:

- Beloyarsk NPP (BN-600 type power unit);
- Bilibino NPP (EGP-12 type power units);

The Russian Country Report comprises the following sections:

- Regulatory requirements applicable to LTO, where a list of the regulatory requirements being in use for life extension activities relevant to civil structures is provided;
- The organization of technical condition monitoring for buildings and structures during the operation and at the life extension phase, which depends on classes and categories of their relevance to radiation and nuclear safety. Examples presented are based on WWER-440 and WWER-1000 NPPs' experience and include description of approaches to visual survey and instrumental examination;
- As an algorithm there is given an examination programme as well as parameters for civil structure technical condition evaluation, main types of damage and degradation factors that impact on operational characteristics of the structures.

As per results of discussion in WG 4, our Report will be amended, in particular, as follows:

- Elements being subject to LTO will be specified.

Information on the method for evaluation of civil structure element residual life (in terms of years) based on the destruction mechanisms will be added.

Slovak Republic (SR) (J. Nozdrovicky and D. Benacka)

At WG 4 meeting, a short presentation of the CIR was made concentrating particularly on the main issues of the Report. Acts related to nuclear power plants were specified and division of individual civil structures into safety classes was described. In Slovakia, there is no law dealing directly with the issues of NPP lifetime extension. About two years ago, based also on IAEA materials, procedures were elaborated for NPP life management; for the time being, their implementation is in the initial stage. In the presentation, a simple distribution of the issues into several summary sheets was mentioned making comparison of individual CIRs easier.

There were no comments on the proposed Quality Programme. Instead of comments on the Quality Programme, brief information on LTO-related activities performed in the Mochovce NPP in the past year was presented:

1) In the Mochovce NPP, Units 3 and 4, the status of already delivered building materials and components for the unfinished building structures were evaluated. Individual civil structures were evaluated in terms of quality, environmental influences and material ageing, complexity of appendant technical documentation, requirements of current legislation, comparison of Mochovce 3 and 4 civil structures with civil structures of the same type in a reference plant (Mochovce 1 and 2), and effect of IAEA recommendations;

2) In the Mochovce NPP, Unit 2, a Leak-tightness Enhancement Programme was initiated in 2004. Procedures for detection of leaks in the hermetic liner hidden under concrete were applied in the reactor hall and in row G using non-destructive methods (tracing gases). Some defects in the hermetic liner were disclosed that would be more closely localised in the future.

In the other part, information was presented on potential deficiencies of our CIR (some chapters have not been completed yet and/or some civil structures are missing). The chapters will be completed by the end of February. But the missing information represents only a

fractional part compared to the completed chapters and does not prevent from starting the process of CIR revision.

It was proposed to distribute individual CIR chapters among WG 4 members by individual civil structures. With regard to the fact that the organisation participating in EBP-LTO (VUEZ, a.s., Levice) has long-term experience with containments, we applied for chapters dealing with the containment as civil structure or those that refer to the containment such as Chaps 2.2, 3.1, 3.2., 3.3, and 3.4.

The division into individual working subgroups with specified chapters satisfies us. We agree to the deadlines settled for the completion of our work.

Sweden (J. Gustavsson)

1. Country Information Report

In Sweden there are no laws that are applicable to long term operation. The laws for civil structures have only functional requirements on a high level. The laws are interpreted by the Board of Housing and the regulations from the Board of Housing do not address long term operation directly. The functional requirements shall of course be fulfilled during the whole lifetime of a structure. The Swedish Nuclear Power Inspectorate gives out regulations for the nuclear area and the only requirement that address civil structures is that there shall be a maintenance program for structures important to safety.

When items for LTO program are chosen, several factors as, degrading mechanism, environment, importance of safety, consequences of failure, etc. are regarded. There are no special ageing management programmes. Instead, the ageing issues are dealt within the generic plant development programs. At Ringhals site the production units have the full responsibility of this work. The other sites use almost the same concept.

When it comes to degrading mechanisms, the most severe one is chloride penetration in the concrete especially in the cooling water tunnels. The chloride penetration causes corrosion of the reinforcement. There are also some other degrading mechanisms that cause corrosion of the reinforcement. For the prestressing system in the containments corrosion of the tendons and loss of stresses are the main degrading mechanisms. Liners are subjected to corrosion and there have been some cases of manufacturing failures that have caused leakage.

The most important inspections that are carried out are general building inspections, inspections of cooling water tunnels, prestressing systems. The containment air tests are carried out according to 10CFR50 App. J option A.

Cathodic protection will be carried out in the cooling water tunnels in order to prevent corrosion of the reinforcement. The methods that can be used are described in the report. In report there are also short descriptions of other maintenance measures that have been carried out.

Structural analysis is used to assess the existing structures when there is a need. Development of that technique is carried out in the CONMOD-project and some other research projects. In the CONMOD project structural analysis are combined with NDT.

2. Programme QA Manual for Document Handling

Two minor comments:

- Clarify responsibilities between hosts for meetings and participants. (4.1);
- The Countries QA-system can be in conflict with the prescribed QA – handling of documents. (4.2)

3. Management of task 2.

A suggestion was made to work with task 2.

4. Formal review of CIR

The following completions will be made in the report:

- Degrading mechanisms will be put into a table with examples of structures subject to the mechanism, acceptance criteria when they exist, safety aspects, lifetime limiting and so on;
- Rules for safety classification;
- Need for future research and development.

Ukraine (O. Mayboroda and M. Semenyuk)

In Ukrainian's presentation the issues of the new regulatory guide "General requirements on NPPs units lifetime extension based on periodic safety review" were discussed. The above mentioned regulatory guide was put in force on 25 December 2004. Till this time, there was no specific document with requirements directly connected with NPP Lifetime extension in Ukraine. The information on the high level requirements will be taken from this document and included in the CIR (Chapter 1).

The "requirements" address the following issues:

- AMP;
- PSR using safety factors;
- Procedure of changing of license conditions connected with lifetime extension;
- Utility activities aimed to NPP unit preparation for LTO.

In that document the criteria of SSCs selection for AMP is determined by all critical components (non replaceable and non-renewal) and shall be included in AMP scope.
Safety margins criteria, specific requirements on testing, ISI, etc. are presented in existing regulations on nuclear and radiation safety.

Ms. Mayboroda presented the state-of-the-art in the field of regulatory base applicable to NPPs building structures LTO. (Because of the design lifetime for Ukrainian NPPs' units is established, the Lifetime extension and LTO have the same definitions).

Very comprehensive norms and rules for inspection, technical state assessment and certification of industrial structures there were issued in 1999 by state Building, Architecture and Housing Policies Committee of Ukraine are enough for ageing management programme of NPP building structures. The volume of this document includes 150 pages in which the detail requirements on frequency and scope of observations, inspections, repairs, calculations, evaluations of documentation, etc. are placed.

In Mr. Semenyuk's presentation the utility approaches for AMP, LTO and the model ageing management programmes for building structures components. Tables on technical state evaluation parameters for metallic and concrete components as well as procedures existing for evaluating the technical conditions were presented. The practice of periodic inspections surveillance, maintenance and repairs were also presented.

The country report was completed by Ms. Mayboroda, who presented suggestions on WG 4 task 2 management.

USA (R. Auluck)

Brief overview of U.S. regulations and guidance documents related to license renewal (long term operation) of nuclear power plants was provided. The presentation focused on areas related to structures and structural components, the area of responsibility of Working Group 4 (WG 4). The use of NRC issued documents NUREG-1800, "Standard Review Plan for Licences Renewal," and NUREG-1801," Generic Ageing Lessons Learned Report "was discussed.

The scoping and screening process of systems structures, and components as used in the U.S. was described with examples related to structures and structural components. The use of GALL report by the U.S. license renewal applicants was described with specific reference to the aging management programs applicable to structures and structural components. Use of ten elements to evaluate the acceptability of aging management programs was discussed. This process useful in determining where existing programs are adequate without modification and which existing programs should be augmented for the period of extended operation. A sample list of typical aging affects and mechanism for concrete and steel was provided. Information and requirements for inspections, surveillance, maintenance rule, and time-limited aging analysis was also discussed

The U.S. comments on the use of LTO-03 in the review process were presented. Difficulties in addressing the plant safety factors as part of CIR review process and use in the final report was discussed. The revised version LTO-03, Rev.1, which was provided at the meeting addressed and resolved this issue.

A proposal to review the CIRS was presented. This included dividing the review responsibility into 3 to 4 subgroups with specific assignments to review 2 to 3 sections for all CIRS. Group members will coordinate draft reports with other member for consistency and for comments. For the purpose of data comparison, it was suggested to the extend possible: (I) identify structures and structural components that are within the scope of LTO by material, (ii) identify and list possible aging effects/degradation mechanisms, and (iii) list programs for managing these aging effects.

European Commission (C. Rieg)

A presentation was handed out (originally delivered at the 1st WG meeting) on the EC contribution to Nuclear Safety and Nuclear Power, with special reference to the LTO relevant activities. It is recommended to refer to the LTO-07 document for the details on its content.

3. DISCUSSION OUTCOMES

3.1 Generic comments on the CIRs

The WG Members provided 8 CIRs to the secretary. Some comments were discussed at the meeting, also as result of some preliminary review of completeness carried out by the secretary himself. They are collected in the following, together with the result of the discussion:

1. LTO is not addressed uniformly: particularly in Countries with no LTO experience and therefore other programs, such as AMP, PSR, LTO, regular maintenance, etc. are often mixed;

2. It was noted that very large lists of structures and components are provided, very often coinciding with the list of safety related items. Moreover, some items explicitly discussed at the first WG 4 meeting are very seldom mentioned in the CIRs, namely:

- Buried pipelines;
- Anchorages, penetrations, hatches, etc.;
- Painting, coating, fire proof coating, etc.

The meeting reminded that the scope of the WG 4 was defined in 2004 in the LTO-07 [4]. It should include the following items:

1. Containment/confinement/pressure boundary structure;
2. Structures inside the pressure boundary (compartment box, reactor box);
3. Other safety classified buildings;
4. Radwaste bldg.;
5. Spent fuel pool;
6. Water intake structures;
7. Foundation systems (turbine, others), embedment, soil-structure interaction issues;
8. Stack;
9. Cooling towers;
10. Buried pipelines;
11. Anchorages, penetrations, hatches, etc.;
12. Painting, coating, fire proof coating, etc.; and
13. Other structures where significant degradation has been recorded.

3. Long lists of degradation mechanisms are provided. However, most of them are not specialized for LTO and have been extracted by AMP lists. Emphasis should be given to the life limiting mechanisms.

4. No quantitative acceptance criteria is provided to compare the different practice and to judge on the life limiting nature of the mechanisms.

5. In some cases a comparison is feasible in terms of frequency of inspections, type of inspection, method of testing. However, few details are provided on the trend analysis and the acceptance criteria. Often, the number of inspected areas and their location are not identified.

6. Not clear distinction is kept in the CIRs between "pre-conditions" and "LTO specific" tasks.

7. Trend analysis and safety assessment in relation to LTO is covered in detail only in few cases.

8. The glossary is not uniform among the CIRs, particularly: the principles of the safety classification should be described (as it is non uniform among the Members), the definition of "non replaceable" components should be provided, etc.

9. The CIRs show in many cases a very qualitative approach that could make the review and comparison rather difficult.

In conclusion, the meeting decided that a limited review of the CIRs could provide great benefit to the quality of the Final WG 4 Report. Therefore, after a thorough review of the proposed table of contents for the Final Report, the following recommendations were agreed upon (to be followed in the next phase, by February 21):

- Concerning Chapter 1 – Reference documents

    1. The complete set of references for the LTO in the MS countries is in the scope of WG 1, not in the WG 4. Therefore, only references related to the WG 4 scope should be provided.

    2. A text (with references) should be added to every title provided, clarifying the regulatory position in relation to the LTO of the systems in the WG 4 scope, if any.

    3. A clear distinction should be made between references issued by the Regulator, the Designer and the Utility/Plant.

- Concerning Chapter 2.1 – LTO objectives and scope

    1. A clear difference should be kept between tasks preliminary to an LTO program ("preconditions" such as availability of a valid CLB, FSAR, etc.) and tasks more "LTO specific" (such as long term safety assessment, trend analysis, economic planning, etc.). Interfaces with the economic planning and life time management may be made explicit.

    2. The LTO objectives for structures and structural components should consider the possibility that the operating life of some of them may be longer than the extended life of the other SSCs, due to their involvement in the decommissioning and dismantling activities. It is the case of some civil structures, particularly in Countries where their use is turned into boundary for waste repository after plant operation. These issues should be addressed, if necessary.

3. A clear description of the scoping procedures should be provided, in relation to the SSCs in the scope of the WG 4 (see above) and also in relation to the other programs running at the plants (AMP, maintenance, PSR, MS&I, etc.).

4. If not self-explaining, details on the safety classification principles should be provided for an unequivocal understanding of the scoping criteria for LTO.

5. Examples should be provided on: a) items in the scope of detailed LTO analysis and b) items in the LTO scope, but covered by generic safety programs already running at the plant.

6. Needs for potential future research in the solution of identified safety issues should be discussed.

- Concerning Chapter 2.2 – AMP

1. Clarify the differences between the AMP in place for current plant operation (in some Countries it includes the MS&I programs) and the AMP developed in an LTO framework: differences in scope, objectives and assessment methods.

2. Clarify the coverage of the AMP on “passive” and “non replaceable” components that seem to receive the highest emphasis in an LTO framework.

3. Provide details on mitigation and repair techniques in relation to the identified degradation mechanisms, as requested at chapter 3.3 of the Final Report table of contents. Examples should also be provided.

- Concerning Chapter 3.1 – Degradation mechanisms

1. A table form is recommended, with clear identification, when possible, of the mechanism (only if LTO relevant), and the acceptance criteria. An example for such a table is provided:

Structure	Degradation Mechanism	Parameters	Assessment methods	Acceptance Criteria

2. Needs for potential future research in the solution of identified safety issues should be discussed (i.e. detection procedures for unexpected mechanism, nature of mechanisms, etc.).

- Concerning Chapter 3.2 – MS&I

1. Information should be provided in tabular form with a clear distinction between the monitoring/inspection systems, the measured parameters, how the locations are chosen, the criteria/basis used to define the time schedule, the way the information is trended for the next 10-20 years.

2. Information on the rationale for areas of inspection, frequency and techniques should be provided, as far as possible.

3. For the inaccessible areas, stressors are usually monitored. Therefore the monitoring programs for the stressors should be highlighted and quantified.

4. Needs for potential future research in the solution of identified safety issues should be discussed, in relation to ISI techniques, monitoring, etc.

- Concerning Chapter 3.3 – Maintenance

1. The interfaces with the LTO should be highlighted;
2. Needs for potential future research in the solution of identified safety issues should be discussed.

- Concerning Chapter 3.4 – Assessment

1. Details of the assessment methodologies in the LTO perspective (i.e. long term) should be provided for the most LTO relevant mechanisms, with reference to the acceptance criteria provided at Chapter 3.1;
2. Examples should be provided;
3. Needs for potential future research in the solution of identified safety issues should be discussed, in relation to assessment methodologies and safety evaluation.

- Concerning Chapter 4 – Reference documents

1. A list of references of the source documents for the information given in the CIRs should be provided.

3.2. Comments on the LTO-3 – SRP – Course of actions in Task 2

WG 2 members reviewed the **IAEA-EBP-LTO-03: SRP Rev.1 [3]**. This report was revised to include guidance for conducting the reviews of the CIRs and describes a process that is to be used to develop draft WG reports based on the review of CIRs.

The review process was considered suitable for the task to be carried out at the WG 4 and no special comment was issued.

In relation to the project QA (LTO-13), some WG 4 Members reported difficulties in matching the SALTO QA and the company QA. The meeting considered these conflicts not essential and decided to address this issue on a case-by-case basis.

WG 4 members expressed their doubts that Appendix V is applicable to the WG 4 activity, for the main reason that the connection between PSR (and therefore the “Safety Factors”) and LTO projects is still not completely clarified in many countries. However, the table will be considered at a later stage of the review as support tool for step 6.

3.3 Method of work and next meeting

WG 4 agreed to a similar review approach as that adopted by the other WGs. Three Review Groups were created to review the specific CIR sections identified below. Each review group identified a leader to facilitate the in-depth discussion and ensure that the review process is conducted in a timely fashion so that the review schedule (see below) would be completed on time.

Review Group	Assigned CIR Sections
Group 1 – Russian Fed., Bulgaria, Ukraine Group Leader – Mr. Zakharov	Sections 1.0, 2.1, 4.0
Group 2 – USA, Sweden, EC Group Leader – Mr. Gustavsson	Section 2.2, 3.1
Group 3 – Hungary, Czech Rep., Slovakia Group Leader – Mr. Maly	Sections 3.2, 3.3, 3.4

During the discussion of the review process for the CIR reports, WG 4 members agreed to the following review schedule. The review schedule was developed taking into account the WG 4 schedule.

Action Item	Scheduled Date for Completion	Outcome
Revise CIRs Based on 2nd WG 4 Meeting	21 February 2005	Reviewed CIRs sent to the IAEA secretary
Review Groups Complete Review of assigned CIR Sections. **First iteration on the FR**	30 March 2005	Draft text of Chapters x.x.1/x.x.2/x.x.3 from the Review group leaders to the IAEA secretary – The review tables (appendix IV) are optional
WG Leader & Secretary Complete Review Report – Combine all Review Groups	22 April 2005	Draft text of the Final report (same chapters as above)
Report to the SC	26-28 April 2005	Feedback from the SC
3rd WG Meeting	May 17-19, 2005	Identification of review actions on the draft FR – Planning the second iteration on the FR. Launching the second iteration on the FR; completion of Chapters x.x.4
Second iteration on the FR	30 June 2005	Revised draft of chapters x.x.1/x.x.2/x.x.3 and new chapters x.x.4 by the review groups.
Finalize Review Report	30 September 2005	Final version of the FR (same chapters as above)
4th WG Meeting, if needed	September, 2005	Launch of Task 3

Note:

1. The location of the meetings will be selected later, according to the work development: either places where particularly interesting data/degradation mechanisms are available/visible and worth for sharing among MS, or places where the logistic arrangement is convenient for most of the Members.
2. The need for the 4th meeting will be evaluated on the basis of the outcome of 3rd meeting".

2.3 Other comments/recommendations to the Steering Committee

Mr. Katona and Mr. Auluck will represent the WG 4 at the SC on April 25-28 at the VIC.

4. ACTION ITEMS

The following actions items resulted from the meeting:

1. Messrs. Katona and Contri agreed to develop and distribute a draft of the minutes of the meeting by January 21. The draft will be reviewed by the WG 4 Member by January 28. No reply by that date means agreement.
2. The Presentations provided by the MS will be available on the project FTP site (ftp://ftp.iaea.org/pub/NSNI/Havel/WG4/) since January 24, for two months.
3. Actions according to the revised workplan for WG 4.

REFERENCES

[1] Minutes of the Programme's 1st Steering Committee Meeting, IAEA-EBP-LTO-01, Vienna, 2003 (internal EBP report).

[2] Minutes of the Programme's Planning Meeting, IAEA-EBP-LTO-02, Vienna, 2004 (internal EBP report).

[3] Minutes of the Programme's Planning Meeting, IAEA-EBP-LTO-03, Rev.1 Vienna, 2004 (internal EBP report).

[4] Minutes of the first WG 4 Meeting, IAEA-EBP-LTO-07 Vienna, 2004 (internal EBP report).

APPENDIX I
MEETING AGENDA

Monday 17 January, 2005		
08:00	Pre meeting, only for Chairman, Secretary and IAEA TOs	P. Contri, T.Katona, M.Batischev, R.Auluk
09:00	Opening, Meeting Objectives	P. Contri
09:15	EBP WG 4 Workplan, the new project QA	T.Katona, R.Auluk, R.Havel
10:30	Coffee Break	
	National Presentations	
11:00	Bulgaria	M Batishchev, M. Milanov
11:45	Czech Republic	M. Maly
12:30	Lunch Break	
14:00	Hungary	S. Ratkai
14:45	Russian Federation	E. Zakharov
15:30	Coffee Break	
16:00	Ukraine	O. Mayboroda, M. Sememnyuk
16:45	Sweden	J. Gustavsson
17:30	Adjourn	
19:00	“Wine and cheese” party at the VIC	
Tuesday 18 January, 2005		
09:00	USA	R.Auluk
09:45	Slovakia	M. Prandorfy (alternate)
10:30	Coffee Break	
11:00	The EC	C. Rieg
11:45	Discussion of National Approaches: scope of LTO, mechanisms, investigations, assessment methods, repairing actions. Comparison of the available CIRs. Review approach	Chaired by Katona, Auluk
12:30	Lunch Break	
14:00	Data comparison issues: quality, quantity, data support, sources and scope	Chaired by Katona, Auluk
15:00	Method of work, merging data, reporting, deadlines, next meeting	Chaired by Katona, Auluk
17:30	Adjourn	

Wednesday 19 January, 2005		
09:00	Updating the WG 4 Workplan. Task 2	Chaired by Katona, Auluk
12:30	Lunch Break	
14:00	Final Discussion, preparation of the minutes, report to the SC (deadline and responsibilities)	Chaired by Katona, Auluk
17:30	Adjourn	

APPENDIX II

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APPENDIX III

PRESENTATIONS HANDOUTS