

AGEING MANAGEMENT FOR LONG TERM OPERATION OF ATUCHA II NUCLEAR POWER PLANT

Brunatti, S.; Ranalli, J.; Versaci, R.

SUBPROGRAMA DE GESTIÓN Y EXTENSIÓN DE LA VIDA DE CENTRALES
NUCLEARES DE POTENCIA.

COMISION NACIONAL DE ENERGÍA ATOMICA

Rio de Janeiro, 16-19 June 2008

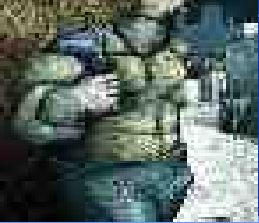


- Introduction
- Long Term Operation
- Ageing Management Programme
- Atucha II Ageing Management Programme
- Conclusions



CONTENTS

- INTRODUCTION
- LONG TERM OPERATION
- AGEING MANAGEMENT PROGRAMME
- ATUCHA II AGEING MANAGEMENT PROGRAMME
- CONCLUSIONS



ATUCHA I



EMBALSE



- Introduction

- Long Term Operation

- Ageing Management

- Atucha II Ageing Management Programme

- Conclusions



ATUCHA II

SAFETY

AVAILABILITY

LONG TERM OPERATION





- Introduction

- Long Term Operation

- Ageing Management Programme

- Atucha II Ageing Management Programme

- conclusions



“Long term operation (LTO) is operation beyond an established timeframe set forth e.g. by licence term, design limits, standards, and/or regulations etc., which has been justified by safety assessment considering life limiting processes and features for Systems, Structures and Components (SSCs)”.



- Introduction

- Long Term Operation

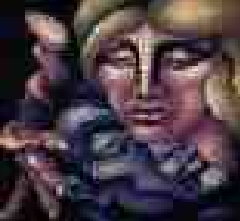
- Ageing Management Programme

- Atucha II Ageing Management Programme

- conclusions



AGEING MANAGEMENT PROGRAMME FOR LONG TERM OPERATION



- Introduction

- Long Term Operation

- **Ageing Management Programme**

- Atucha II Ageing Management Programme

- conclusions



The importance of ageing management programmes is widely recognized. Ageing is the continuous time degradation of materials due to normal service conditions which include normal operation and transient conditions. The ageing management is combination of engineering, operations and maintenance actions to control ageing degradation and wear out of structures, systems or components remains within acceptable limits.



- Introduction

- Long Term Operation

- **Ageing Management Programme**

- Atucha II Ageing Management Programme -Conclusions



Ageing Management Programme is a basis documents for licences operating and for the periodical renewal.

Ageing Management Programme of the SSCs is the base to be able to operate the Nuclear Power Plant for a Long Term, typically 60 years, and is the fundamental thing for a continuous operation.



The attributes of an effective ageing management programme are:

2. A defined programme scope. The scope of the programme should include the specific structures and components subject to an ageing management review;
1. Identification of preventive actions or parameters to be monitored or inspected;
3. Detection of ageing degradation/effects. Detection of ageing effects should occur before there is a loss of the intended function(s) of a structure or component.
4. Monitoring and trending including frequency and methodologies. Monitoring and trending to provide predictability of the extent of degradation, and timely corrective or mitigative actions;



Continuation-The attributes of an effective ageing management programme are:

5. Pre-established acceptance criteria. Acceptance criteria against which the need for corrective action will be evaluated, to ensure that the intended function(s) of a structure or component are maintained;

6. Corrective actions if a component fail to meet the acceptance criteria.

7. Confirmation that required actions have been taken.

8. Administrative controls that document the programmes implementation and actions.

9. Operating experience feedback.



- Introduction

- Long Term Operation

- **Ageing Management Programme**

- Atucha II Ageing Management Programme

- conclusions



SSCs suitable for LTO

If an SSC is important to safety, its failure does impact safety function, and it is not replaced and refurbished within a specified time interval, then it is subject to a LTO review. If an SSC is important to safety, but it is replaced or refurbished within a specified time interval, then it is not subjected to LTO review. If an SSC is not important to safety but its failure could impact safety functions, then it is also subject to LTO review.



- Introduction

- Long Term Operation

- Ageing Management Programme

- **Atucha II Ageing Management Programme**

- conclusions



AGEING MANAGEMENT PROGRAMME FOR ATUCHA II LONG TERM OPERATION



- Introduction
- Ageing Management Programme
- Long Term Operation

Atucha II Ageing Management Programme

-Conclusions



In Atucha II Nuclear Power Plant, given the delays in their construction, carry out an Ageing Management Programme of SSCs is of fundamental importance. In this programme special emphasis should be put in the possible stressors of the degradation like consequence of the delays in the construction.



- Introduction

- Long Term Operation

- Ageing Management Programme

- **Atucha II Ageing Management Programme**

-Conclusions



Equipment and material stored.

Design changes.

Technological advances.

Missing information.

Other plant experiences.



- Introduction

- Long Term Operation

- Ageing Management Programme

- **Atucha II Ageing Management Programme**

-Conclusions



Selection of critical components for LTO.

Material/degradation mechanisms matrix and indicators systems of material degradation.

Existing and missing information about critical components.



IDENTIFY THE CRITICAL COMPONENTS

Considerations: Safety
Reliability, Cost

Design Requirements,
Safety Analysis
Manufacturing/
Construction

**REVIEW DESIGN
MANUFACTURING AND
CONSTRUCTION DATA**

Operating Environment,
Unusual Events
Inspection and
Maintenance

**REVIEW OPERATING
HISTORY**

**AGEING
ASSESSMENT**

Identify Stressors

Determination of

Ageing Mechanisms

**LIFE MANAGEMENT
PROGRAMME**

External
Experience



AMES



- Introduction

- Long Term Operation

- Ageing Management Programme

- **Atucha II Ageing Management Programme**

-Conclusions



Existing and missing information about surveillance, monitoring and maintenance programmes of critical components.

Operating organizations should evaluate current surveillance, monitoring and maintenance programmes for effectiveness in detecting and characterizing the ageing mechanisms for each structure and component. The evaluation should provide a technical basis to justify that the ageing phenomena will be adequately detected with the proposed inspection or monitoring activities.



- Introduction

- Long Term Operation

- Ageing Management Programme

- **Atucha II Ageing Management Programme**

- conclusions

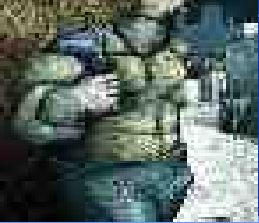


Date base design and filling for critical components.

Operating organizations should consider developing a living database that documents the effectiveness of maintenance in detecting and characterizing degradation mechanisms.

The database should provide technical references to support findings and conclusions.

Operating organizations should consider developing and maintaining databases (similar to RPV surveillance specimens) for I&C materials.



- Introduction

- Long Term Operation

- Ageing Management Programme

- Atucha II Ageing Management Programme

-Conclusions



Ageing Management Programme is the fundamental thing for maintain a high level of safety, optimise the operation, maintenance and service life of SSCs, maintain an acceptable level of performance, maximize return on investment over the service life of the NPP; and provide NPP utilities/owners with the optimum pre-conditions for Long Term Operation.



Many thanks for your attention

