

Year 2000 Effect at Nuclear Power Plants in Spain

Lorenzo Francia
UNESA
Francisco Gervás, 3
28020 Madrid (Spain)

1. Introduction

As is well known, the problem known as the Year 2000 Effect may have an impact, of greater or lesser scope, on computer applications and on equipment and instruments with embedded software at all types of installations, among them Nuclear Power Plants (NPPs).

The issue of the Year 2000 problem should not be magnified or underestimated. The actions taken should be oriented such that the issue may be addressed explicitly at each Plant.

To this effect, the Spanish NPPs initiated and have established Management Plans within the framework of the Year 2000 Project, aimed at addressing and avoiding the potentially negative impact that the Y2K problem might have on plant safety and availability.

Furthermore, the Spanish nuclear regulatory body (Nuclear Safety Council, CSN) has requested that the NPPs provide information on their programs for action in this area (the aforementioned Management Plans), and has recommended that the operators of the different plants exchange information, experiences and plans in order to meet this challenge.

2. Y2K Project Management Plans

The NPP Y2K Project Management Plans contain the methodology and criteria being applied in the performance of tasks aimed at solving the Year 2000 problem at the installations. These plans are based on, or have taken as a valid reference, the Guideline NEI/NUSMG 97-07, "*Nuclear Utility Year 2000 Readiness*", published by the US Nuclear Energy Institute (NEI) and submitted to the US regulatory body, the NRC.

The contents of the Y2K Project Management Plans have the following structure:

- Project phases and activities and their planning:
 - Awareness of the problem
 - Inventory of equipment, applications and suppliers
 - Analysis of the inventory
 - Development of corrective measures
 - Verification tests
 - Implementation
 - Information and closure of the Project

- Working method

- Organization (functions and responsibilities)

- Contingency plan

- Quality plan

3. **Joint NPP Action**

In addition, in keeping with the directives agreed on by the UNESA Nuclear Energy Committee (UNESA is the association of the main electricity utilities in Spain), an ad-hoc Group has been created, with the representation of all the NPPs and the support of the UNESA Nuclear Directorate, its mission being to jointly obtain, develop and coordinate the NPP action plans on the basis of common methodologies and decision-making and evaluation criteria. The aim is as follows:

- To take advantage of experiences, synergies and technological know-how;
- To channel synergies with regard to common suppliers of computer applications and equipment;
- To reduce the risk of error;
- To optimize the available resources; and
- To present a common position with respect to the CSN, as recommended by this body.

One of the tasks that is being developed and coordinated by the ad-hoc Y2K Group, and which warrants special attention because of its interest and the added value it brings to the individual NPP plans, is the definition and drawing up of a joint Database (DB), based on the inventories of computer equipment and applications at each plant and potentially affected by the Y2K problem.

The fundamental objective of this joint DB is to identify possible discrepancies and elements common to and/or shared by the different NPPs, at the same time guaranteeing coherent and appropriate treatment of the work carried out at these plants.

The structure of the joint DB contemplates and organizes a range of items of relevant information related to the Y2K problem. By way of an example, the following contents may be underlined:

- Classification by types of elements and applications (PLC's, recorders, plant instrumentation, laboratory equipment, configuration software, operating systems, development tools, database motors, applications software, embedded software, computers, communications and networks, pending items).
- Classification of Suppliers, on the basis of homologation and certification of the conformity of their products with regard to the Y2K effect, by Quality Assurance.
- Prioritization of each of the elements in the inventory, considering type and relationships to plant safety, availability and/or economic impact (Critical; Important; Optional/Advisable; Irrelevant).
- Actions to be taken with respect to the element (No action; Modification; Replacement; Elimination).

4. Status of the work

The degree of progress of the work may be estimated at around 70-80% of the established schedule.

Letters have been sent to the different suppliers of computer equipment and applications, for them to certify that their products are not affected or, otherwise, to propose suitable remedies.

Advantage will be taken of the NPP refuelling outages to carry out the appropriate previously defined verification and validation tests, as well as the previously identified modifications or changes to computer equipment and applications.

The CSN is to carry out audits at three nuclear power plants during the first four months of the year. The requirement established by the CSN is that by June 1999 all the NPPs should have completed their working programs to ensure that no system or item of equipment is affected by the Y2K problem. If any of the aforementioned programs were not yet completed by that date, the plant involved

should submit a schedule for the completion of pending tasks, in order to confirm that the installation will be ready for the year 2000 when that critical date arrives.

UNESA
Ad-hoc Y2K Group

Table of Phases and Activities within the Year 2000 Project

No	PHASES	ACTIVITIES
1	AWARENESS	INFORMATION
		PROJECT LAUNCHING
2	INVENTORY	INVENTORY OF SYSTEMS, APPLICATIONS, EQUIPMENT AND SUPPLIERS
3	ANALYSIS AND EVALUATION	ASSESSMENT OF DATA PROVIDED BY SUPPLIERS
		INTERNAL ASSESSMENT
4	DEVELOPMENT OF CORRECTIVE MEASURES	DESIGN OF SOLUTION, STUDY OF ALTERNATIVES AND PROPOSALS FOR SOLUTION
		MODIFICATIONS
		REPLACEMENTS
		CONTINGENCY / REMEDIATION PLAN
5	VERIFICATION TESTS	UNIT / SINGLE TESTS
		GENERAL INTEGRATION TESTS
6	IMPLEMENTATION	PLANNING
		INSTALLATION
7	INFORMATION AND PROJECT CLOSURE	DOCUMENTATION
		NOTIFICATION

UNESA
Ad-hoc Y2K Group

Structure of joint Database for inventories of
equipment/applications regarding the Year 2000 Effect

Plant:	<input type="text"/>
Code/Alias of equipment and/or application:	<input type="text"/>
Version or model:	<input type="text"/>
Description and use:	<input type="text"/>
Supplier (vendor/manufacturer):	<input type="text"/>
Supplier clasificación, according QA:	<input type="text"/>
Type of element or application:	<input type="text"/>
Responsible Service/Section:	<input type="text"/>
Priorization:	<input type="text"/>
Affected:	<input type="text"/>
Action:	<input type="text"/>
Observations:	<input type="text"/>
Common Code:	<input type="text"/>