The Spanish nuclear regulatory authority, the Consejo de Seguridad Nuclear (CSN), requires the use of codes and standards in force in the country of origin of the plant technology.

For this reason, the in-service inspection and testing programs applied at Spanish nuclear power plants basically adhere to the requirements of the ASME XI and ASME OM Codes.

It is not surprising that when the earliest developments aimed at drawing up risk informed in-service inspection and testing programs were initiated within the framework of ASME, the Spanish industry should follow such developments very closely.

In fact, persons within the Spanish nuclear industry joined different ASME committees involved in the development and approval of the various code cases encompassing these developments.

Developments specific to the Spanish nuclear power plants were initiated at a time when the aforementioned reference documentation was in a very advanced stage of development/approval.

Two clearly differentiated lines of work got under way:

On the one hand, and as regards risk informed in-service testing programs, the American standards were used as the sole reference.

In the case of risk informed in-service inspection programs, the Spanish nuclear power plant-owning utilities and the Consejo de Seguridad Nuclear decided to draw up a Spanish guideline that, although using the ASME developments as a reference, would have its own specific characteristics.

In relation to the above, and referring to the chronology of the events, the activities performed to date in Spain have been as follows:

RI-IST (check valves) ASCO NPP

The development of a check valve in-service testing program for the two groups of Ascó NPP (a PWR Westinghouse design) started in 1997. Scope covered both, valves within the scope of current ASME programs and valves within the scope of Probabilistic Safety Analysis.

As a result of this development, a categorization of valves between high safety significant (20% of valves) and low safety significant (80% of valves) was established.
For those categorized as HSS an improved testing program was designed. For those categorized as LSS, a maximum testing frequency of ten years was established instead of present three month testing interval.

Test frequencies are subjected to revision depending on the testing results.

RI-IST (valves & pumps) COFRENTES NPP

At around the same time, Cofrentes NPP developed a valve and pump testing program including valves and pumps in the scope of ASME testing program and PSA projects.

Summarizing, test frequencies proposed to the regulatory body were:

For a first group of valves, test frequencies of six years have been proposed instead of present tests at each refueling outage. For a second group the proposal is to test valves every two refueling outages instead of each one. And for a third group test frequencies of eighteen month instead every three months have been proposed.

Test frequencies are subjected to revision depending on the testing results.

RI-IST IN COURSE

Recently, and ending with risk-informed testing programs, pneumatic valve testing programs have been developed at the two groups of the Ascó NPP.

RI-ISI SPANISH GUIDELINE / RI-ISI (class 1 piping) Ascó 2 NPP

As already pointed out, the approach was different in relation to the risk-informed inspection programs. From the very beginning the decision was taken to address the preparation of a guideline including both the methodology to be used and the minimum documentation required for submittal of the program to the regulatory authority and the assessment criteria to be used by the latter. The methodology was checked through application at pilot plants. Drawing up of the guideline began in 1998.

Once preparation of the guideline had started, Ascó 2 NPP decided to develop a risk-informed inspection program for class 1 piping in parallel to the development of the guideline itself. This development was incorporated into the preparation of the guideline as a pilot study.

Other systems at the same plant, and systems at Sta. Mª de Garoña NPP (a BWR plant), also formed part of these pilot studies.

Details of the development of the Spanish Guideline for Piping Risk Informed In-Service Inspection Programs are included later on.

In year 2000 the guideline was approved, and shortly afterwards Ascó NPP presented its inspection program.

The results of this program imply a reduction up to 60% (from 220 to 87) in the number of areas presently subjected to inspection.
In the case of 25 of the 87 proposed areas to be inspected, only VT-2 inspection focalized in very specific locations would be required.

RI-ISI IN COURSE

Developments of the risk-informed inspection programs for Almaraz 2 NPP (class 1 piping) and Ascó 1 NPP (class 1 piping) have been presented to the regulatory authority in 2001.