

# APPLICATION OF NUCLEAR INSURANCE RISK ASSESSMENT USING RISK INFORMED METHODOLOGIES

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## SUMMARY

As the nuclear industry matures, nuclear insurance loss control risk assessment strategies must continually evolve to reflect plant age, operational history and insurance losses. This paper provides insights into the application of insurance risk strategies utilized by nuclear insurers for underwriting and conducting nuclear insurance engineering loss control inspections throughout the operational life of nuclear power plants worldwide. The process utilizes both qualitative and quantitative techniques and continues to evolve seeking a mutually agreeable risk tolerance between insured and insurer.

## NUCLEAR INSURANCE RISK ASSESSMENT

For more than forty years as a specialized branch of the worldwide insurance industry, nuclear insurance companies have underwritten financial protection for nuclear facilities throughout the world. At nuclear power plants insured by nuclear insurers, an enviable record of operational safety has been attained. Nevertheless, equipment and processes do break down occasionally. Although these failures do not necessarily compromise nuclear safety, they can cause significant damage to equipment, leading to a considerable loss of generating revenue, possible off-site contamination and result in sizeable insurance losses.

Since insurance companies have a large financial stake in nuclear power plants, their goal is to minimize insurance losses, including the failure of systems and equipment and ensuing consequential damages. To ensure that the insurance risk is properly underwritten, insurance companies analyze loss information, develop loss prevention guidelines and

strategically focus engineering loss control activities on those areas where insurance risk is most significant.

A prime concern for an insurer is predicting whether present design, operation, maintenance and life extension strategies will effectively mitigate premature and unanticipated time dependent failure that can produce an increase in insurance exposure. Normally, this increase in insurance exposure can be assuaged by reducing the insurance risk through engineering loss control and/or increasing the spread of risk. There are several methods to address the spread of risk. In this instance, we consider a reasonable spread to be a mix between well-operated and maintained reactors and less than optimally well operated and maintained reactors as well as a mix of both older and newer nuclear plants. Economic pressures to reduce operating and maintenance expenditures can also increase risk.

Nuclear insurance risk assessment can use a seven-element, iterative, risk-based process. The approach is not complex, but does require technical expertise and knowledge of insurance principles. The fundamental objective of the process is to develop a model that identifies the major risk contributors of insured systems, components, structures, processes and programs proportional to their insurance loss or risk significance. As nuclear power plants mature, insurance risk assessments and loss control inspection strategies evolve to accommodate the prospective insurance risk. A broad outline of insurance inspection strategies with respect to plant age is illustrated in the Figure 1 below.

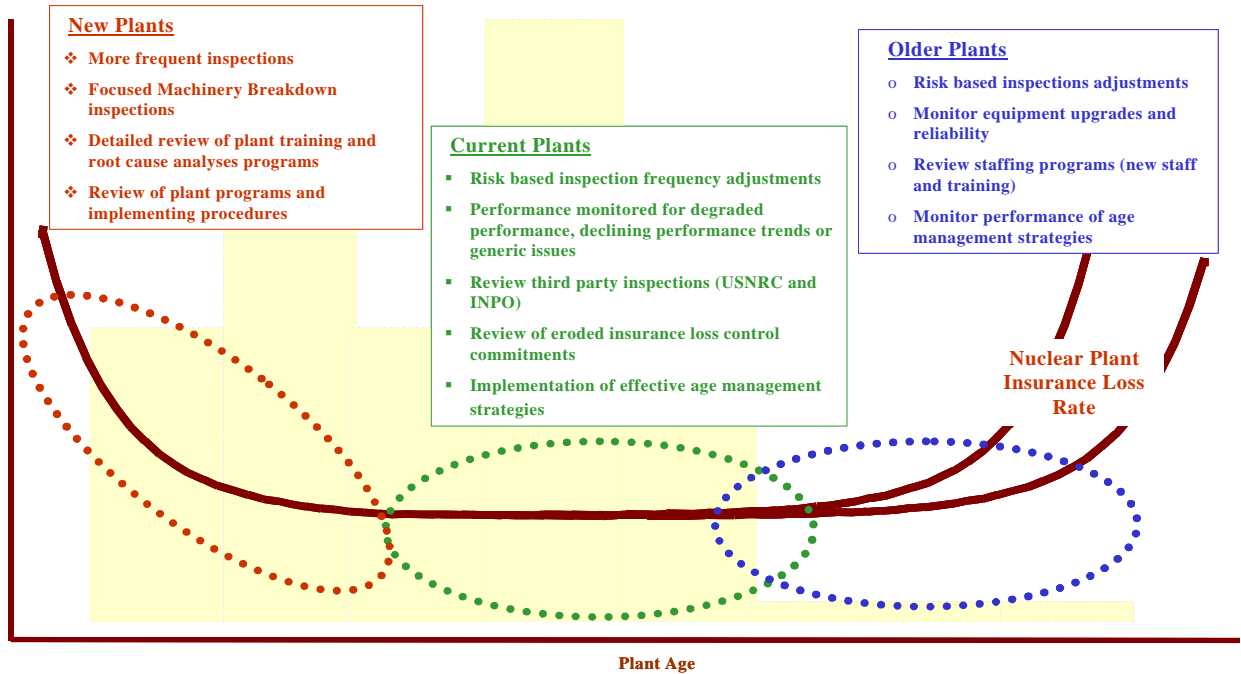


Figure 1 – Nuclear Insurance Inspection Strategies vs. Plant Age

## REFERENCES

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