

Support for the Nuclear Regulatory Commission US Reactor Inspection Program

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BNL is supporting the development of risk-informed inspection notebooks, also called Significance Determination Process (SDP) notebooks, as tools to aid the Nuclear Regulatory Commission (NRC) in evaluating the licensees' performance of the commercial nuclear power plants through the inspection process. This activity, initiated in support of the USNRC's New Reactor Oversight Process (ROP), requires the NRC inspectors to characterize the risk significance of the licensees' performance deficiencies using the SDP notebooks.

Each SDP notebook contains up-to-date information on plant systems, including support system dependencies. The notebooks also include specific plant initiators, accident mitigation methods for each initiator, the level of redundancy in each mitigation capability, and the required procedural operator actions. A rudimentary method of evaluation is also incorporated to allow a quantitative evaluation of the risk impact of the inspection findings.

BNL worked with the Research Office of the NRC to develop the Rev. 0 SDP notebooks in FY-01. The Rev. 0 notebooks are currently being verified through a benchmarking process and the final modified versions are being issued as Rev. 1 SDP notebooks. A total of 70 Rev. 1 SDP notebooks is expected to be published by FY-03 which would cover a total of 70 nuclear sites and 103 commercial nuclear power plants. These notebooks are currently being maintained at the NRC Intranet site and the notebooks are periodically updated as needed to ensure that the risk significance determination process is accurate and effective.

Even though the SDP notebooks and evaluation process were designed to support the new NRC's oversight program, many other areas have been identified which can effectively utilize the SDP notebooks as an integral part of their evaluation process. The SDP notebooks have proved to be a systematic tool for reviewing the abnormal events. The detailed information contained in the SDP notebooks has also been shown to be an effective means of reviewing the plants' specific Probabilistic Safety Assessment (PSA) studies.



SDP notebooks have been used as a source for understanding accident propagation and mitigation on a plant-specific basis. In some cases, SDP notebooks have been relied on as a first step to evaluate and prioritize the safety issues to decide if further analyses or actions are warranted.

Finally, the concept and approach implemented in developing the SDP notebooks are consistent with general PSA methods. Therefore, their use would not be limited to commercial nuclear power plants. SDP methodologies and notebooks could be developed for any complex facility where the safety or economical performance would be of concern.

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