integrity to verify certain functions. Solicitation of public comments to guide this future work is included later in this notice.

The rule proposed in this notice would apply to all NRC licensees who operate light water power reactors. The proposed rule would allow licensees the option of continuing to comply with the current appendix J or to adopt the new performance-based standards.

The NRC's analyses are based upon the insight gained through the use of probability risk assessment techniques and the significant data base of practical, hands-on operating experience gained since appendix J was promulgated in 1973. This operating experience provides hard evidence of the activities necessary to conduct appendix J testing, and the costs of those activities both in monetary terms and occupational radiation exposure.

The results of the present effort documented in draft NUREG–1493, which are based on NUREG–1150, confirm previous observations of insensitivity of population risks from severe reactor accidents to containment leak-rates.

The current appendix J requirements have achieved the regulatory criteria of assuring an essentially leak-tight boundary between the power reactor system and the external environment (GDC Criterion 16). Costs associated with complying with current appendix J requirements are estimated to be $165,000 for a complete battery of Type B/C tests and $1,890,000 for Type A tests. Over the average reactor's remaining lifetime of 20 years, the present value of all remaining leak testing at a five percent discount rate is about $7 million per reactor. Estimates of the remaining industry-wide costs of implementing current appendix J requirements range from $720 to $1,080 million, approximately 75 percent of which could be averted with a performance-based rule.

The present study found that by allowing requirements with marginal effect on safety, but which impose a significant cost on licensees, to remain in effect is to essentially misallocate a portion of the NRC's and the industry's resources on activities for which there is no commensurate return in safety. The real cost then may be in a missed opportunity to focus NRC and licensee efforts to areas where the return in terms of added public safety is higher.

Specific alternatives for modifying the current appendix J were identified by the public in response to the NRC's **Federal Register** notice published on January 27, 1993 (58 FR 6196). Those whose characteristics matched the NRC's established criteria for the marginal to safety program were selected for further review.

Modifications of Initial Proposals

Allowable Leakage Rate

The NRC had initially planned to establish, by rulemaking, a risk-based allowable leak-rate commensurate with its significance to total public risk. Specific findings from draft NUREG–1493 on the allowable leakage rate include:

1. Allowable leakage can be increased approximately two orders of magnitude (100–200 fold) with marginal impact on population dose estimates from reactor accidents.

2. Calculated mean population risks are several orders of magnitude below the NRC's Safety Goals for all reactors considered, but the tail of the distribution can approach Safety Goals.

3. Increases in the allowable leak-rate is estimated to have a negligible impact on occupational exposure.

Relaxing the allowable leak-rate is estimated to reduce future industry testing costs by $50 to $110 million, a ten percent decrease in overall leak-rate testing costs.

A risk-based allowable leakage rate would be based on an evaluation, using PRA, of the sensitivity and significance of containment leakage to risk, and determining an appropriate containment leakage limit commensurate with its significance to the risk to the public and plant control room operators. However, this would entail a major change in policy and restructuring of the current licensing basis and a more complete understanding of the uncertainties associated with the threat of severe accidents to the containment, and therefore, the NRC plans to consider a modification of the performance standard (allowable leakage level) in the second phase separate from modifications of testing requirements. This modification will be part of a broader effort to further examine the risk significance of various attributes of containment performance, i.e. structural and leak-tight integrity of containment system structures and components, and inadvertent bypass.

On-Line Monitoring (OLM) Systems

Currently, there is no requirement for OLM systems which monitor the containment to detect unintentional breaches of containment integrity.

Studies discussed in draft NUREG–1493, ''Performance-Based Containment Leak Test Program,'' find that, based on operating experience, OLM would not significantly reduce the risk to the public from nuclear plant operation and, thus, cannot be justified solely on risk-based considerations. Specific findings include:

1. Continuous monitoring methods that exist appear technically capable of detecting leaks in reactor containments within 1 day to several weeks. OLM systems are in use or planned in several European countries.

2. OLM systems are only capable of detecting leaks in systems that are open to the containment atmosphere during normal operation (approximately ten percent of the mechanical penetrations).

3. The technical and administrative objectives of OLM systems and Type A tests are different.

4. OLM cannot be considered as a complete replacement for Type A tests because it cannot challenge the structural and leak-tight integrity of the containment system at elevated pressures.

5. Analysis of the history of operating experience indicates limited need for, and benefit of, OLM in the U.S.

Although OLM cannot be justified solely based on risk considerations, a plant already possessing such a system has greater assurance of achieving certain attributes of containment integrity. Therefore, OLM systems could contribute towards an overall leakage monitoring scheme. Some capability for on-line monitoring already exists as a byproduct of specific containment designs. For example, licensees with inerted BWR containments, or subatmospheric PWR containments, would readily detect gross leakages that develop during normal operation.

Given that the application of on-line monitoring is specific to containment design, and generic application cannot be justified solely on risk considerations, the NRC does not propose a requirement for OLMs. However, licensees which already have such a capability (e.g. inerted BWR containments, and subatmospheric PWR containments) are encouraged to propose plant-specific application of such a capability, including credit for any added assurance for certain attributes of containment integrity provided by such a system compared to other testing methods. The NRC will reconsider the role of OLM in the second phase of modifications in this area along with the allowable leakage rate.

Proposed Modification of Type A, B, C Test Intervals

The NRC proposes at this time, for the first phase of modifications, to define a new risk-based regulation by utilizing the performance history of components