

it represents a coherent, integrated model, and have sufficient detail to support the initial categorization of SSCs into the safety-significant, and low safety-significant categories.

The quality and scope of the plant-specific PRA will be assessed by the NRC taking into account appropriate standards and peer review results. The NRC has also prepared a draft regulatory guide (DG-1122) on determining the technical adequacy of PRA results for risk-informed activities. As one step in the assurance of technical quality, the PRA must have been subjected to a peer review process assessed against a standard or set of acceptance criteria that is endorsed by the NRC. Thus, the NRC staff would use the NEI Peer Review Process as modified in the NRC's approval, or the ASME/ANS Peer Review Process, as modified in the NRC's approval. As discussed in Section VI, NRC has developed review guidelines for considering the sufficiency of a PRA that was subjected to the NEI peer review process, as it would be used in implementation of § 50.69. The submittal requirements listed in § 50.69(b)(2) include a requirement to provide information about the quality of the PRA analysis and about the peer review results.

V.4.1.2 Risk Categorization Process Based on PRA Information

For SSCs modeled in the PRA, the categorization process relies on the use of importance measures as a screening method to assign the preliminary safety significance of SSCs. (Other methodologies such as success path identification methodologies can also be used, however, this discussion will focus on the use of importance measures because these are the most commonly used tools to identify safety significance of SSCs, for example, in the implementation of § 50.65.) In addition to being a useful tool to help prioritize NRC staff and licensee resources, use of importance measures can provide a systematic means to identify improvements to current plant practices. The determination of the safety significance of SSCs by importance measures is also important because it can identify potential risk outliers and therefore, changes that exacerbate these outliers can be avoided; and it can facilitate IDP deliberations of SSCs that are not modeled in the PRA, for example, events from the ranked list can be used as surrogates for those SSCs that are not modeled or are only implicitly modeled in the PRA.

For SSCs modeled in the PRA, SSC importance must be determined based

on both CDF and LERF. Importance measures should be chosen so that results can provide the IDP with information on the relative contribution of an SSC to total risk. Examples of importance measures that can accomplish this are the Fussell-Vesely (F-V) importance and the Risk Reduction Worth (RRW) importance. Importance measures should also be used to provide the IDP with information on the margin available should an SSC fail to function. The Risk Achievement Worth (RAW) importance and the Birnbaum importance are example measures that are suitable for this purpose.

In choosing screening criteria to be used with the PRA importance measures, it should be noted that importance measures do not directly relate to changes in the absolute value of risk. Therefore, the final criteria for categorizing SSCs into the safety-significant and the low safety-significant categories must be based on an assessment of the potential overall impact of SSC categorization and a comparison of this potential impact to the acceptance criteria for changes in CDF and LERF. However, typically in the initial screening stages, an SSC with $F-V < 0.005$ based on CDF and LERF, and $RAW < 2$ based on CDF and LERF can be considered as potentially low safety-significant. IDP consideration of §§ 50.69(c)(1)(ii), (c)(1)(iii), and (c)(1)(iv) should be carried out to confirm the low safety significance of these SSCs.

In determining the importance of SSCs, consideration should be given to the potential for the multiple failure modes for the SSC. PRA basic events represent specific failure events and failure modes of SSCs. The calculation of SSC importance should take into account the combined effects of all associated basic PRA events (such as failure to start and failure to run), including indirect contributions through associated common cause failure (CCF) event probabilities.

Another concern that arises because importance measures are typically evaluated on the basis of individual events is that single-event importance measures have the potential to dismiss all elements of a system or group, despite the system or group having a high importance when taken as a whole. (Conversely, there may be grounds for screening out groups of SSCs, owing to the unimportance of the systems of which they are elements.) One approach around this problem is to first determine the importance of system functions performed by the selected plant systems. If necessary, each component in a system is then evaluated to identify

the system function(s) supported by that component. SSCs may be initially assigned the same category as the most limiting system function they support. System operating configuration, reliability history, recovery time available, and other factors can then be considered when evaluating the effect on categorization from an SSC's redundancy or diversity. The primary consideration in the process is whether the failure of an SSC will fail or severely degrade the safety function. If the answer is no, then a licensee may factor into the categorization the SSC's redundancy, as long as the SSC's reliability assumed in the categorization process and that of its redundant counterpart(s) have been taken into account.

When the PRA used in the importance analyses includes models for external initiating events and/or plant operating modes other than full power, caution should be used when considering the results of the importance calculations. The PRA models for external initiating events (e.g., events initiated by fires or earthquakes), and for low power and shutdown plant operating modes may be more conservative and have a greater degree of uncertainty than for internal initiating events. Use of conservative models can influence the calculation of importance measures by moving more SSCs into the low safety significance category. Therefore, when PRA models for external event initiators and for the low power and shutdown modes of operation are available, the importance measures should be evaluated for each analysis separately, and the results of the analyses should be provided to the IDP.

As part of the demonstration of PRA adequacy, the sensitivity of SSC importance to uncertainties in the parameter values for component availability/reliability, human error probabilities, and CCF probabilities should be evaluated. Results of these sensitivity analyses should be provided to the IDP. In IDP deliberations on the sensitivity study results, the following should be considered:

(1) The change in event importance when the parameter value is varied over its uncertainty range for the event probability can in some cases provide SSC categorization results that are different. Therefore, in considering the sensitivity of component categorization to uncertainties in the parameter values, the IDP should ensure that SSC categorization is not affected by data uncertainties.

(2) PRAs typically model recovery actions, especially for dominant accident sequences. Estimating the