SAFETY ASSESSMENT

The Safety Assessment may be thought of as the front end of the development of the Integrated Safety Analysis (ISA) which will be prepared at the license stage to comply with the requirements of 10 CFR 70. The objectives of the safety assessment are to identify hazards and events which could challenge the safety of the facility and the principal structures, systems, and components (PSSCs) needed to mitigate or prevent these events. These three posters display the mechanics of the applicant's safety assessment process, the purpose of the NRC's safety assessment review, the scope of the NRC's safety assessment review, the review criteria, and open items which were identified in the review.

POSTER 1

Poster 1 shows the basic process steps of the safety assessment of the design basis and how it relates to and supports the ISA which will be completed for the next stage of licensing.

As shown on the diagram, the major inputs at the construction authorization stage are the site description from which natural phenomena hazards and external man-made hazards are identified and the preliminary facility design from which internal process hazards are identified.

All credible events are then grouped into event types in accordance with the hazard and the workshop or process that they are associated with. For each event, accidents are identified, bounding consequences are evaluated, and the unmitigated consequences compared with the performance requirements of the regulation.

Where performance is not met, PSSCs are identified such that the consequences are prevented or mitigated in accordance with the requirements of the regulation. These identified PSSCs, which are generally at the systems level, then become inputs to the final design.

POSTER 2

In the final design or ISA stage, the system level PSSCs are broken down into items relied on for safety at the system and component level. At this stage, reliability and dependability values are determined so that consequence frequencies may be calculated.

These frequencies are compared with the regulation's performance objectives, improved if necessary, and safety limits are identified where required to assure acceptable initial conditions.

POSTER 3

Purpose

The major purpose of the safety assessment review was to review the hazards analyses which the applicant used to develop the PSSCs for the facility. The safety assessment review was a team effort and was complemented by detailed technical reviews of the more discipline or process specific sections of the application.

A number of issues were fed back to the safety assessment from the technical reviews and were defined in the context of performance issues. These issues are identified in the staff Draft Safety Evaluation Report as unidentified events, incomplete strategies, or incomplete design bases (which are covered in the technical reviews)

Throughout the review process, the safety assessment team meetings served to help reviewers become aware of each other's issues and provide other technical input as necessary.

Scope

The scope of the safety assessment review consisted of reviewing the applicant's analyses of natural phenomena such as seismic events, floods, and high winds as well as external man-made events such as potential industrial explosions, chemical releases, or aircraft hazards; and process hazards. The evaluation of process hazards required an evaluation of facility worker consequences, public and site worker consequences, environmental consequences, and the means for preventing or mitigating these consequences

Criteria

The criteria used in the safety assessment review consisted of likelihood (or probability) which was directly applied, in most instances, to evaluation of natural phenomena and external man-made events. For the evaluation of process hazards, all events were initially considered as events which may occur within the life of the facility.

The applicant used a deterministic argument for many of the facility worker consequence evaluations. Sometimes the staff required additional information such as dose calculations to evaluate the reasonableness of the argument. The applicant also applied deterministic reasoning for excluding some natural phenomena and external man-made events from consideration.

The use of safe and accepted practices was considered in reviewing the applicant's selection of PSSCs and mitigation and/or prevention strategies. In some cases, the history of certain types of events at similar or related facilities was researched to establish what practices may have caused the event. In other cases adherence to standards, regulatory guides, and practices safely used in the nuclear industry was accepted as an indication of safe and accepted practice.

The availability of mitigation and prevention strategies as a criteria, was primarily applied to prevention or mitigation of consequences to the site worker or public from process hazards. Generic hardware failure rates along with the recognition that choice of surveillance interval can significantly increase dependability was often considered if it was determined that a strategy, if properly implemented, would be acceptable for meeting the 10 CFR 70.61 performance requirements.

Open Items

The open items consisted of the need for more information to verify the applicant's assumptions regarding a postulated explosion in F-Area to ensure that such an event would not cause a radioactive release at the facility; the need for projected flight information to update the applicant's aircraft hazard analysis; and the need to justify the applicant's strategy of preventing a seismic induced release in regard to isolation of utility and or other gas or fluid lines.

<Boards 1 & 2>

Safety Assessment

CAR Figure 5.4-1 (page 5.4-23 & 5.4-25)

<Board 3>

Safety Assessment

Purpose of the Safety Assessment Review

- **Review hazards analysis**
- **Define potential issues in context of performance**
  - **Unidentified events**
  - **Additional information needs (strategies)**
- **Assure a multi-discipline technical approach where necessary**

Scope of Safety Assessment Review

- **Natural phenomena hazards**
- **External man-made events**
- **Process hazards**
  - **Facility worker consequences**
  - **Public and site worker consequences**
  - **Environmental consequences**

Review Criteria

- **Likelihood**
- **Acceptability of deterministic approach**
- **Use of safe and accepted practices**
- **Availability of mitigation and/or prevention PSSCs**

Open Items

- **DOE information is needed to verify the applicant's assumptions regarding a postulated explosion in F-Area.**

- **Aircraft hazard analysis provided is insufficient to exclude the consideration of aircraft impact load for Seismic Cat. I structures because the analysis that was provided did not consider projected flight information that could affect the site over the life of the project.**

- **Applicant needs to justify the mitigation strategy of the seismic event in regard to isolation of utility lines.**