

- f) Integrated evaluation of damage to surroundings areas, identification of possible scenarios of a failure development due to hostile actions, their consequences and the probability of their occurrence via an event tree analysis or "risk curves" - depending on a specific site, plant type, and additional protection systems.
- g) Research on means of protection: shielding, underground siting, layout - and structural changes, shelters and/or other technical solutions for the population.

REFERENCE:

- 1. Aruety, S., in IA-1364, 1981, p. 48.

REFERENCE INITIATING EVENT FOR AN EXTERNALLY INITIATED SEVERE ACCIDENT IN  
A 950 MWe LWR

A. Ketter (Kenigsberg)

Externally initiated events, particularly war related accidents, are classified in Israel as DBAs (Design Basis Accidents). Therefore a study is being carried out aimed at achieving a realistic evaluation of the risk to the public and providing the means to start a conceptual design with the potential of mitigating accidents of this kind.

The first step is to define a typical hypothetical initiating event. Due to the wide range of uncertainty in selecting such an event, it serves as a reference beginning event only, and permits the development of scenarios and analyses in the consecutive phases of the accident.

As a basis for a "standard" threat, i.e. not a threat developed especially for that plant (a "special" threat should be considered separately), the following scenario was defined:

Main Scenario:

- a. Pre-accident conditions: the plant is operating at full power and the reactor core has reached a state where most of the significant fission products concentrations are in equilibrium.
- b. Initiating event description: the power station site is hit by one aerial missile having the potential to penetrate any one of the station buildings and severely damage the equipment in only one spatial compartment ("room") inside the building.

c. Additional assumptions: the reactor is assumed to be scrammed successfully. The missile penetration causes a hole having an area in the range of 0.15 - 1.5 m<sup>2</sup>. The compartment containing the reactor pressure vessel is unlikely to be damaged. Common cause failures may be assumed. However, independent failures, (e.g. earthquakes) simultaneously occurring with the initiating event are excluded.

A major factor in the recovery potential of the plant after the accident starts is whether the power supply to the emergency safety features is available. Electric power supply might be available either through the external electric network or through a system of at least two redundant and separated diesel-generator sets. Though the probability of simultaneously damaging all the power supply sources is considered low, due to its critical importance, a variation to the main scenario was introduced.

Variation:

As an alternative, different scenario, another pre-accident condition is added: all ac power supplies (offsite and emergency diesels) to the station become unavailable simultaneously with the described initiating event. All other conditions and assumptions are the same.

This kind of definition makes a consequent scenario analysis possible, and is, in fact, the first event to take place in an event-tree developed for the accident.

#### IODINE REMOVAL IN A REACTOR CONTAINMENT FOR A LONG-TERM TRANSIENT

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An externally initiated accident in a nuclear power plant might result in a containment penetration. From that point, a severe accident might develop resulting in a large release of radioactivity to the atmosphere. However, even though the containment is initially breached, the release of radioactive material is considerably delayed

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