Rating of Fuel Damage Events

Additional Guidance to the INES User's Manual

From INES Advisory Committee Meeting 13-17 Oct. 2003

1. Background

The International Nuclear Event Scale (INES) is a means for promptly communicating to the public in consistent terms the safety significance of any reported event associated with radioactive material and/or radiation. It is not the purpose of INES to describe the activities or installations that have to be included within the scope of the regulatory control system for radiation protection, nor to establish requirements for events to be reported by the users to the regulatory authority. It is also not the purpose of INES to establish requirements for communications to the public, but when an event is communicated, this guidance provides criteria for its rating so as to put the event into proper perspective for communication purposes.

2. Objectives

This note provides additional guidance for the rating of events involving fuel damage or degradation. It is consistent with the principles of the INES Users' Manual (2001 Edition) but provides more detailed information. It should be used in conjunction with the On-Site Definition of Levels contained in Section III-2.2. It is intended for use on a trial basis from March 2004.

3. Additional Guidance – On-Site Impact

Level 5. Severe damage to the reactor core or radiological barriers

The definition "More than a few percent of the fuel in a power reactor is molten or more than a few percent of the core inventory has been released from the fuel assemblies" was intended to consider the total inventory of the core including the "gap" on reactors with a fuel design that has a gap between the fuel pellets and the cladding of the fuel pin. The fuel pin cladding constitutes one of the radiological barriers. Severe damage to this barrier such that nearly all of the gap inventory of the core is released into the reactor coolant, should also be rated at level 5.

Level 4. Significant damage to the reactor core or radiological barriers or fatal exposure of a worker

The definition "Any fuel melting has occurred or more than about 0.1% of the core inventory of a power reactor has been released from the fuel assemblies" was also intended to consider the total inventory of the core including the "gap" on reactors with fuel design that has a gap

between the fuel pellets and the cladding of the fuel pin. The fuel pin cladding constitutes one of the radiological barriers. Significant damage to this barrier such that more than a few percent of the gap inventory of the core is released into the reactor coolant, should also be rated at level 4.

It should be noted that the on-site impact for levels 3 and lower was not intended to be considered for fuel damage events, but for application to non-reactor installations or exposure and contamination events. Fuel damage or degradation that does not reach level 4, should be rated using Defense in-depth criteria.