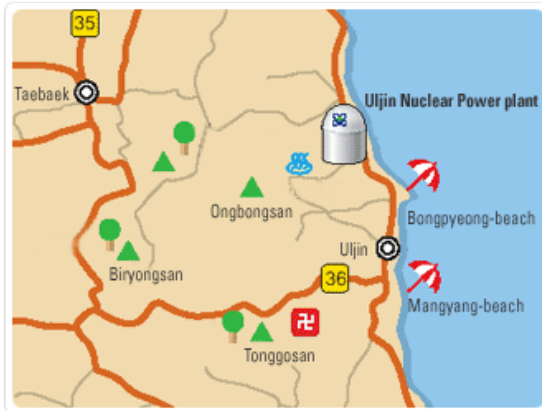


Uljin NPP, Unit 3, South Korea - Common-cause software error

Source: NUREG/CR-6842, Advanced Reactor Licensing: Experience with Digital I&C Technology in Evolutionary Plants, NRC 2004



In 1999 an incident at Uljin Nuclear Power Station Unit 3 in Korea corrupted data on the performance net of the plant control computer. The incident was caused by the failure of an Application-Specific Integrated Circuit (ASIC) chip on a rehostable module, which is part of a network interface module. Several non-operational pumps started without any demand, some closed valves opened and other open valves closed, and some circuit breakers switched on or off. There was also some relay chattering. Due to the response of the operators and because of diverse systems, the incident was mitigated without adverse consequences. A review of the systems found that a common-cause software error was the likely cause. It was found that there was no provision to protect against foreign writes in the global memories within the communication network. As a result, software modifications were implemented that included a change of data format, mirror testing, status testing, and hardware foreign write protection.

Extensive modifications, including hard-wired backups, were subsequently carried out.