

Nuclear power plants around the world have made headlines in recent years because of controlled reactor shut downs precipitated by partial losses of power known as "open-phase faults." A reliable source of offsite electric power is critical to the safe shutdown of a nuclear power reactor. Offsite power is normally supplied from the local transmission system via conductors from each of the three phases. An open-phase fault occurs if

ETAP is the most commonly used software in U.S. nuclear power plants. In fact, 97% of these plants already use ETAP to analyze their auxiliary power systems, which means that detailed models of these plant's electrical systems already exist. However, at the time of the initial open-phase fault events at Byron, ETAP software did not include the capability to analyze an open-phase fault. While there were other software tools available that could be used to simulate an open-phase fault, these were not well-suited for performing a comprehensive analysis of the effects the fault may have on each of the numerous electrical loads throughout various safety systems. Early attempts to use some of these software tools emphasized that their use would become cost-prohibitive, especially when iterative analyses were needed. This was not a viable solution for the nuclear industry because ultimately such high costs for performing engineering analysis would have to be passed along to electric utility customers.

Because ETAP software is the de facto standard for design and analysis of the power systems at U.S. nuclear power plants, many power system analysis experts throughout the U.S. nuclear industry are members of the ETAP Nuclear Utility Users Group (ETAP NUUG). Thy nuclear y nucleaG)(e)

The ETAP enhancements have been reviewed and applauded by ETAP users at both the 2013 and 2014 ETAP NUUG Conference and Symposium. The work of the ETAP NUUG on the enhancement of ETAP was recognized by the NRC at a Washington, D.C. public meeting in June 2013. WANO also recognized the importance of this effort by requesting a presentation at the January 2014 Open Phase Workshop in Paris. As a bonus, the new ETAP capabilities directly align with guidance recently provided by the NRC in a (draft) technical position document on open-phase conditions.

Here is what others say about this achievement:

“I was particularly impressed when ETAP and their nuclear users group quickly responded to a request by the nuclear industry to address the modeling of a new vulnerability. The dedication of highly skilled programmers to work closely with industry power system experts resulted in a product that will be useful in developing open-phase indication circuitry to maintain the health and safety of the public.” Gordon Clepton - Senior Project

quality. Meeting the quality standards set by our nuclear customers has benefitted our