

The following supporting information is provided:

- Based on the evaluation of the PWROG FLEX Data Collection and Analysis efforts (which is still in draft form, and contains operating experience from PWRs and BWRs), the NRC modified the SPAR model reliability parameters by a factor of three. The factor of three chosen by the NRC is a best-estimate case based on the draft results of the PWROG analysis which show that FLEX equipment failure rates can be between 2 and 8 times the nominal failure rates. Based on the draft PWROG results, the NRC sensitivity is appropriate to characterize the current reliability estimates of FLEX equipment, and no further actions are recommended.
- The LOOP occurred at 12:49 p.m. on August 10th. The Vinton 161-kilovolt line was restored at 11:26 p.m. on August 11th. Due to the stable nature of the plant, conservative action was taken to ensure that the line was stable, and the startup auxiliary transformer was energized 49 minutes later. Therefore, contrary to what was stated in the preliminary ASP report, offsite power was available to be restored to the safety buses approximately 22.6 hours after the event started. Thus, a more realistic assessment of the risk of this event can be obtained by crediting offsite power recovery within 24 hours.
- Pilot application of the NRC IDHEAS-ECA methodology performed by the PWROG determined that plants that have a prescriptive time associated with declaration of ELAP had a much lower calculated HEP associated with this action. Specifically, the IDHEAS-ECA methodology for that plant yielded an HEP of 1.1×10^{-3} , which is an order of magnitude lower than the screening value applied in ASP analysis for Duane Arnold. While this example plant was a PWR with different procedures, declaration of ELAP is relatively straightforward and this example illustrates that there may be considerable conservatism in the NRC-applied screening values of 1×10^{-2} for declaration of ELAP. This should be investigated further by the NRC and a plants-specific HEP should be developed for the declaration of ELAP for Duane Arnold. As mentioned above, the NRC evaluation applied only screening values to the FLEX HFES that were applied in the SPAR model. While a plant-specific human reliability analysis (HRA) evaluation for these actions has not been completed using the IDHEAS-ECA tool, evidence from the pilot application of the NRC IDHEAS-ECA tool by the PWROG reveals that several of the actions applied may be conservative. It is therefore recommended that the FLEX HEPs be investigated further by the NRC and plant-specific HFES should be developed for the other FLEX operator actions credited.