Duane Arnold Energy Center Loss of Offsite Power Due to Derecho

May 27, 2021

Outline

- Duane Arnold Overview
- Summary of the Event
- Insights

DAEC Overview

- GE BWR/4 – Mark I Containment
- Rated Thermal Power 1,912 MW(t)
- Rated Net Electric Power ~615 MW(e)

Plant status prior to event

- **Plant Status on August 10, 2020**
  - Reactor Power approximately 80% due to surveillance testing on LPCI
  - Diesel Driven Fire Pump inoperable due to maintenance
  - Dry cask storage campaign under way in the spent fuel pool

- **Weather Forecast for August 10, 2020**
  - National Weather Service Storm Prediction Center issued Moderate Risk Outlook
  - At 11:38 the National Weather Service Issued a Severe Thunderstorm Watch for the DAEC area which was upgraded to a Severe Thunderstorm Warning at 12:02

Detailed Event Summary

- **August 10 – 12:30 to 12:35**
  - High sustained winds cause perturbation in the power lines feeding DAEC
  - At 12:35 voltage drop is significant enough to automatically start the diesel generators, but they did not tie on to their respective buses as offsite power was still available
- **August 10 – 12:49**
  - Sustained high winds damage all power lines leading to the plant causing a loss of offsite power
  - The plant responded as designed
    - The reactor tripped and all control rods fully insert
    - Emergency Diesel Generators (already operating) automatically connect to and power their respective essential buses
    - Operators enter their emergency response procedures
  - Notice of Unusual Event Reported to the NRC

Detailed Event Summary

- **August 10 – 13:00 to 24:00**
  - Operations establishes a controlled cooldown to begin shutdown cooling
  - Emergency Service Water strainer differential pressure alarm in Control Room
    - Operations bypassed strainer in accordance with station procedures
    - Emergency Service Water system stable operation throughout the event
  - Systems restored to facilitate plant reliability
    - Reactor Water Cleanup
    - Spent Fuel Pool Cooling
    - General Service Water
  - Coordinate with ITC to prepare Switchyard for repairs

Detailed Event Summary

- **August 11 – 02:30**
  - Operations established cold shutdown conditions
- **August 11 – 11:26**
  - 161kV Vinton line is restored to the switchyard restoring off-site power
  - Decision is made to perform a controlled evolution to restore power as the Emergency Diesel Generators are performing well
- **August 11 – 12:15**
  - Startup transformer is reenergized from offsite power
- **August 11 – 13:12 to 13:24**
  - Safety Bus A and B reenergized from offsite power
- **August 11 – 16:00**
  - Notice of Unusual Event Terminated

Insights

- **There was never an impact to public health or safety**
- **The plant operated as designed when offsite power was lost**
  - The loss of the cooling towers did not impact the ability to safely shut the plant down, decay heat removal maintained through the Cedar River
- **Operators responded in accordance with plant procedures**
- **Plant achieved safe shutdown**
- **Subsequent actions**
  - Assisted SRA and SRI with risk significance
  - Engaged owners group to provide insights for generic impact
  - Provided comments to NRC ASP report