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March 25, 2021

MEMORADUM TO: Raymond V. Furstenau, Director
Office of Nuclear Regulatory Research

FROM: Mark Thaggard, Director
Division of Risk Analysis
Office of Nuclear Regulatory Research

Signed by Thaggard, Mark on 03/25/21

SUBJECT: TRANSMITTAL OF THE ACCIDENT SEQUENCE PRECURSOR PROGRAM 2020 ANNUAL REPORT

This memorandum transmits the Accident Sequence Precursor (ASP) Program 2020 Annual Report. The ASP Program assesses licensee event reports (LERs) at U.S. nuclear power plants to identify potential precursors to core damage.

For the 2020 report, seven events were determined to exceed the ASP Program threshold and, therefore, are precursors. Five of these precursors were identified by independent ASP analyses and the remaining two precursors were identified by risk assessments associated with greater than *Green* findings. Note that one of these precursors occurred in 2019 and, therefore, is considered as a 2019 precursor for trending purposes. Although, the number of precursors in 2020 (6) experienced a slight increase from the 2019 (3) and 2018 (4) counts, this annual total is still historically low. In addition, the number of LERs issued and those identified as potential precursors continue to decrease to historically low levels.

No significant precursors were identified in 2020. However, for the first time in 3 years, four precursors with conditional core damage probability (CCDP) or increase in core damage probability greater than or equal to 10^{-5} were identified. One of these precursors—the loss of offsite power at Duane Arnold Energy Center had a CCDP of 8×10^{-4}. This is the first precursor with a CCDP or ΔCDP greater than or equal to 10^{-4} identified since 2012.

A review of the trends over the past decade (2011–2020) reveals statistically significant decreasing trends for all precursors and most precursors subgroups (e.g., higher-risk precursors initiating events, degraded conditions, losses of offsite power, precursors at pressurized-water reactors, etc.). However, no statistically significant trends were identified for precursors at boiling-water reactors and emergency diesel generator degraded conditions during this same period.

The decreasing 10-year precursor trends continue to support the observation that current agency oversight programs and licensing activities remain effective.

Enclosure:
As stated

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