Nuclear power plants continue to seek ways to improve efficiency and reduce maintenance. Equipment failures represent the potential for plant shutdowns and a significant cost for field maintenance. By detecting anomalies in equipment functionality, plants can anticipate potential failures and perform significantly less expensive preventative maintenance. Anomaly detection is available currently; however, it tends to be a complex application: It requires subject matter expertise, requires a technician to build and tune models; and then regular maintenance to run and manage the models over time. Working with Palo Verde Nuclear Station, Curtiss-Wright is commercializing a unique approach to the problem of anomaly detection. This solution uses a deep recurrent auto-encoder neural network with time series outlier detection to simplify the identification of anomalies. The solution requires minimal subject matter expertise, and no equipment models. The algorithm is refreshed with new data at regular intervals, and performs routine retraining automatically. The software performs hierarchical clustering on any anomalies found to group them into related sets and presents them to the end user on a web-based dashboard. The user has the ability to review the anomalies, view related plant OE and then either generate a condition report, or provide feedback on the anomalies as insignificant, which feeds back into the analytic model to modify the algorithm. The application, designed for operating plants in the nuclear industry has additional potential for the difficult problem of start-up and shutdown anomaly detection, as well as for wind and fossil facilities.