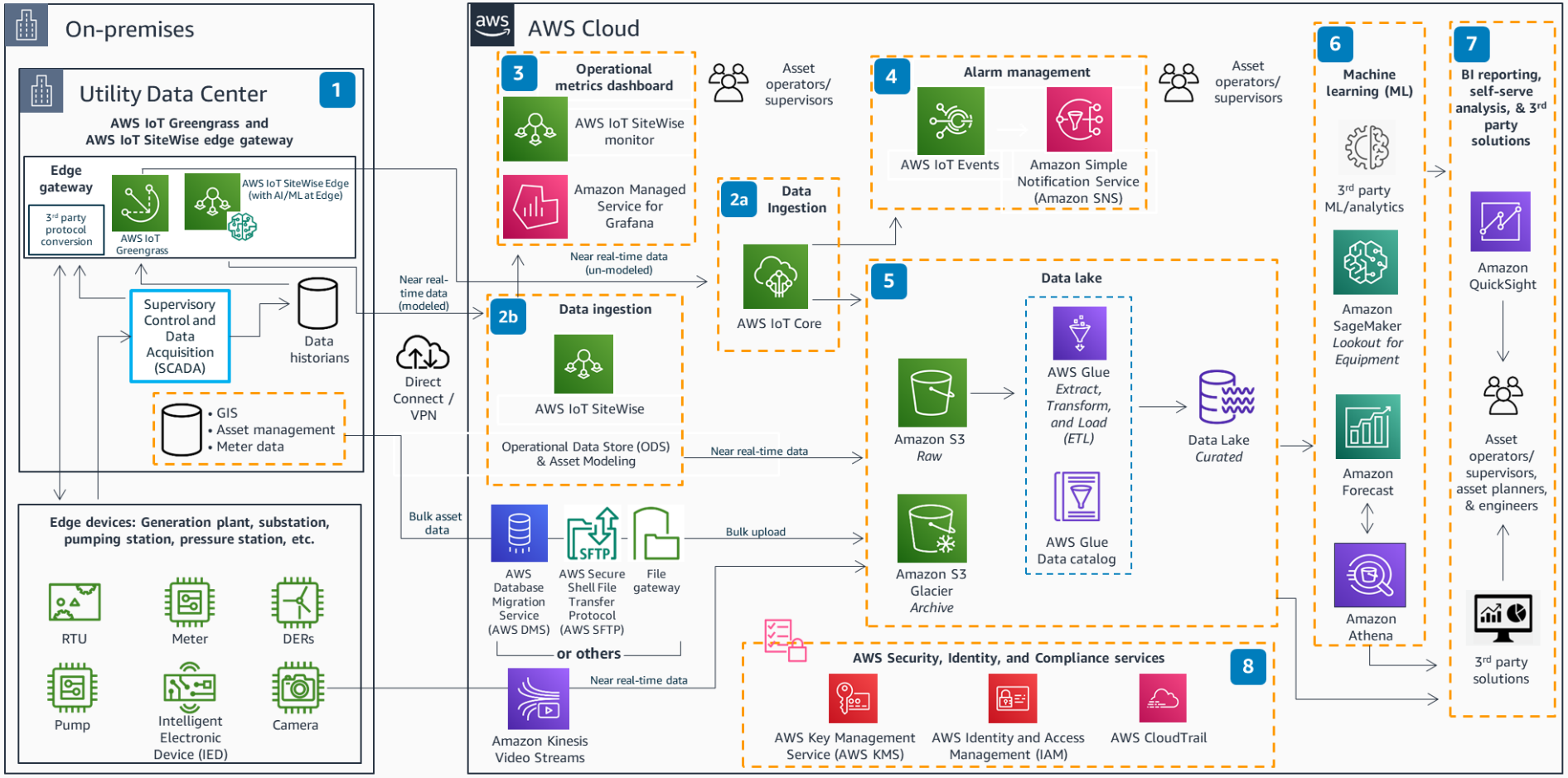
# Predictive Equipment Health for Utilities

Build a modern, end-to-end, field-to-cloud solution for ingestion of near-real-data from utility assets, devices, and a multitude of common utility systems using AWS services. Use analytics and machine learning services, operating on a data lake, to derive insights and predict the health and longevity of your assets.




1. Data sources on the edge utilize **AWS IoT Greengrass** and **AWS IoT SiteWise** edge for seamless connectivity and data preparation from Supervisory Control and Data Acquisition (SCADA), 3rd party protocol converters, Geographical Information System (GIS), data historians, and edge devices. **AWS IoT SiteWise** runs compiled machine learning (ML) models for local inference and actioning.

2a. Data is ingested directly from asset to **AWS IoT Core**, for non-asset modelled data.

2b. Data is ingested at scale with asset modelling in **AWS IoT SiteWise**.

3. Real-time operational dashboard of *data* (critical asset performance metrics) via **AWS IoT SiteWise** monitor or **Amazon Managed Service for Grafana (AMG)**.

4. Build detector models in **AWS IoT Events** to continuously monitor the state of assets and issue immediate email and SMS alerts via to operational staff via **Amazon Simple Notification Service (Amazon SNS)**.

5. **Amazon Simple Storage Service (Amazon S3)** serves as the data lake and *single version of truth* for all consumers. **AWS Glue** performs ETL functions and builds the data catalog. Infrequently-accessed data is moved to **Amazon S3 Glacier** for cost-effective archival.

6. Curated data from the data lake is utilized by Amazon AI/ML services (e.g. **Amazon SageMaker** and **Amazon Forecast)** or 3rd party ML services for predictive health analysis and assessment. The results can be readily consumed by asset owners and/or 3rd party asset applications.

7. Detailed Business Intelligence (BI) reporting occurs via **Amazon QuickSight** and 3rd party solutions (GIS, Asset Management, and Tableau).

8. All communication is fully secured, traceable, authenticated, and encrypted by AWS Security, Identity, and Compliance services.

*Reviewed for technical accuracy August 3, 2021*



**AWS Reference Architecture**