

Cold Weather Critical Component Monitoring Strategy

Andrew Valencia, PE
Senior Vice President of
Generation



Agenda

- **Review LCRA's cold weather preparation and after-action process**
- **Discuss LCRA's Monitoring Strategy**
- **Discuss LCRA Data Evolution**

LCRA Cold Weather Preparation Process

Site Procedures

- **Written procedure and checklists for each site**
 - Required supply inventories and equipment checks
 - Location, type of temporary measures
- **Plant directors affirm execution of site procedures**
 - By early November
 - Documentation for all checks performed
- **Senior manager tours each site to verify preparations**
- **Also follow site procedures and checklists for actions while temperatures below freezing**

Preparation Meeting – Early November

- Includes staff from generation, plant management, qualified scheduling entity operations, meteorology
- **Discuss:**
 - Expected weather patterns
 - Expected real-time market conditions
 - Preparation status
 - Questions, concerns, needed resources
- **Document action items**

LCRA Monitoring Strategy

LCRA Monitoring Strategy

- **Strategy is dependent on severity of event, Levels 1 - 4**
- **Additional equipment surveillance by operations personnel**
- **Additional staffing brought in to help with further surveillance**
- **Battle stations staffing**
- **Generation Emergency Command Center**

LCRA Monitoring Strategy

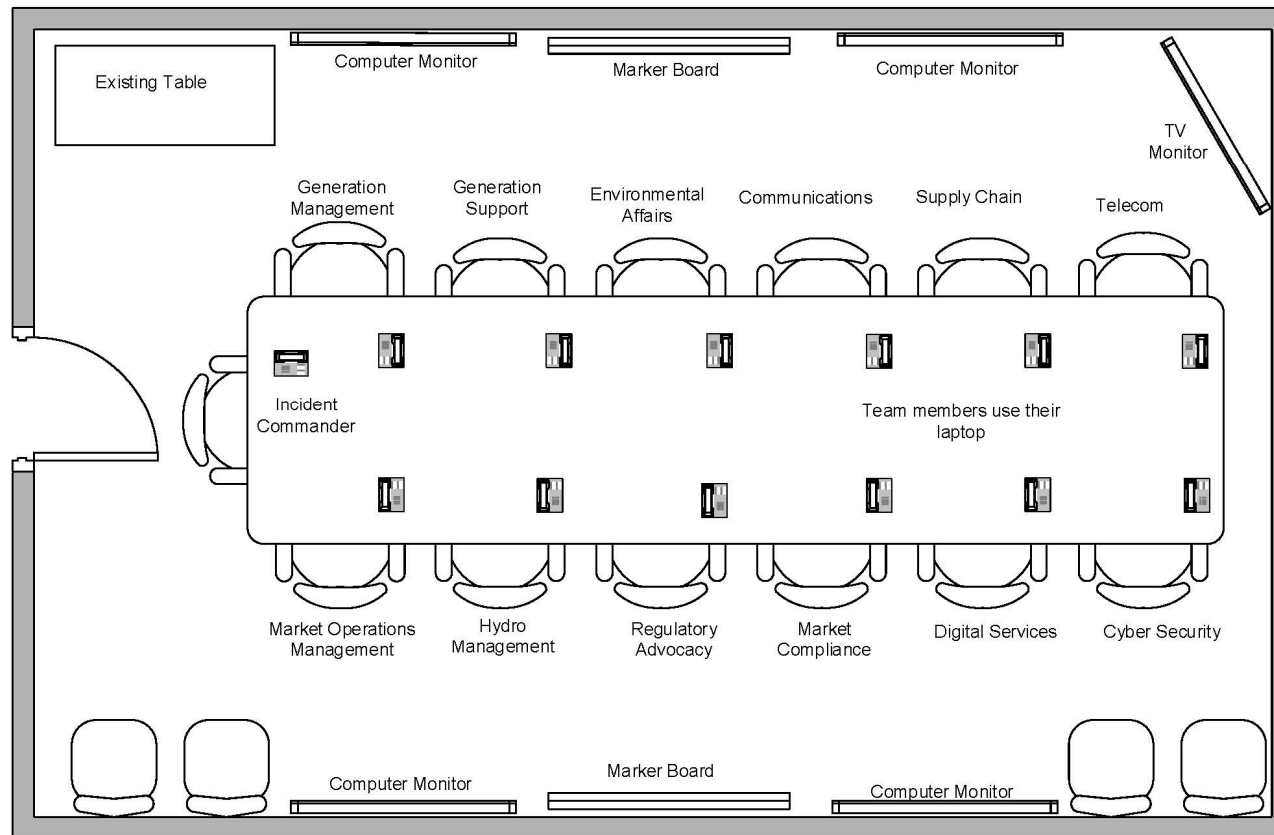
- **Battle Stations staffing involves every employee in Generation**
- **Every employee is assigned a task and a location**
- **Put in place for a Level 3 event or sooner depending on the situation**

LCRA Monitoring Strategy

- **Plant, QSE and meteorology staff hold daily calls to discuss:**
 - **Plant status and known risk**
 - **Market/ERCOT status**
 - **Weather issues – severity, duration, timing**
 - **Offline units**
 - **Fuel supply needs**
- **Depending on severity of event, hold additional calls with managers on duty, risk staff**
- **For Level 4 event, may activate Generation Emergency Command Center**

LCRA Monitoring Strategy

Generation Emergency Center – L215



LCRA Data Evolution

LCRA Data Evolution

- Prior to 2016 plant data resided at the site
- In 2016, LCRA set up a Fleetwide Enterprise Historian (EdNA/PODS)
- Data from each site was viewable from any network computer
- LCRA was data-rich

LCRA Data Evolution

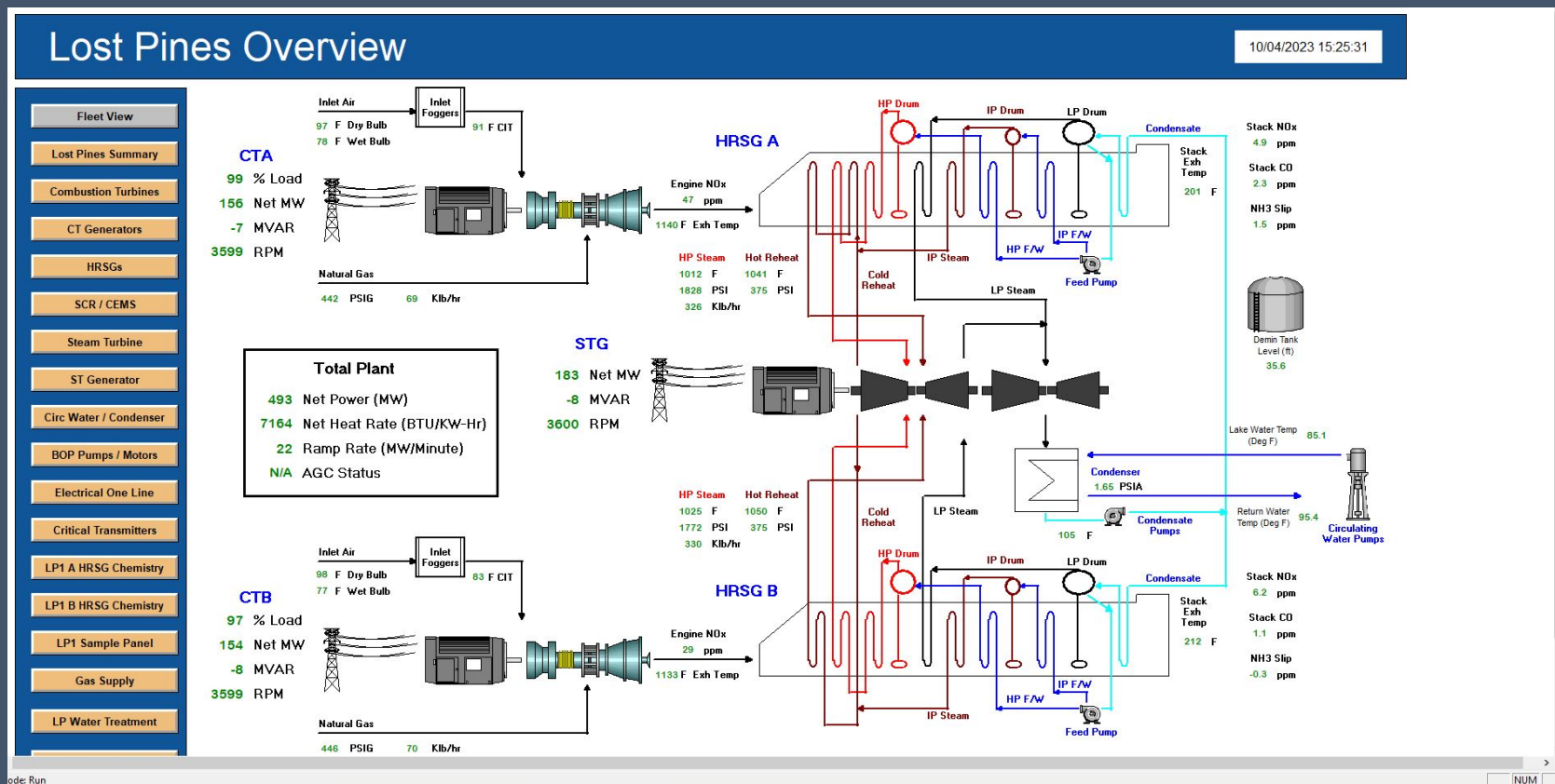
- **We have over 55k points in our historian**
- **In 2019, we began evaluating a Data Analytics solution**
- **HanPHI for HanAra was selected and implemented in Dec 2019**
- **Installed on 100+ PCs, including in our control rooms**

LCRA Data Evolution

- Plant models were built and tuned using a year's worth of data
- Near real-time data flows from historian to HanPHI and is compared to predicted values
- Deviations are graded and alarmed if they meet definable criteria

LCRA Data Evolution

PODS Overview Screen



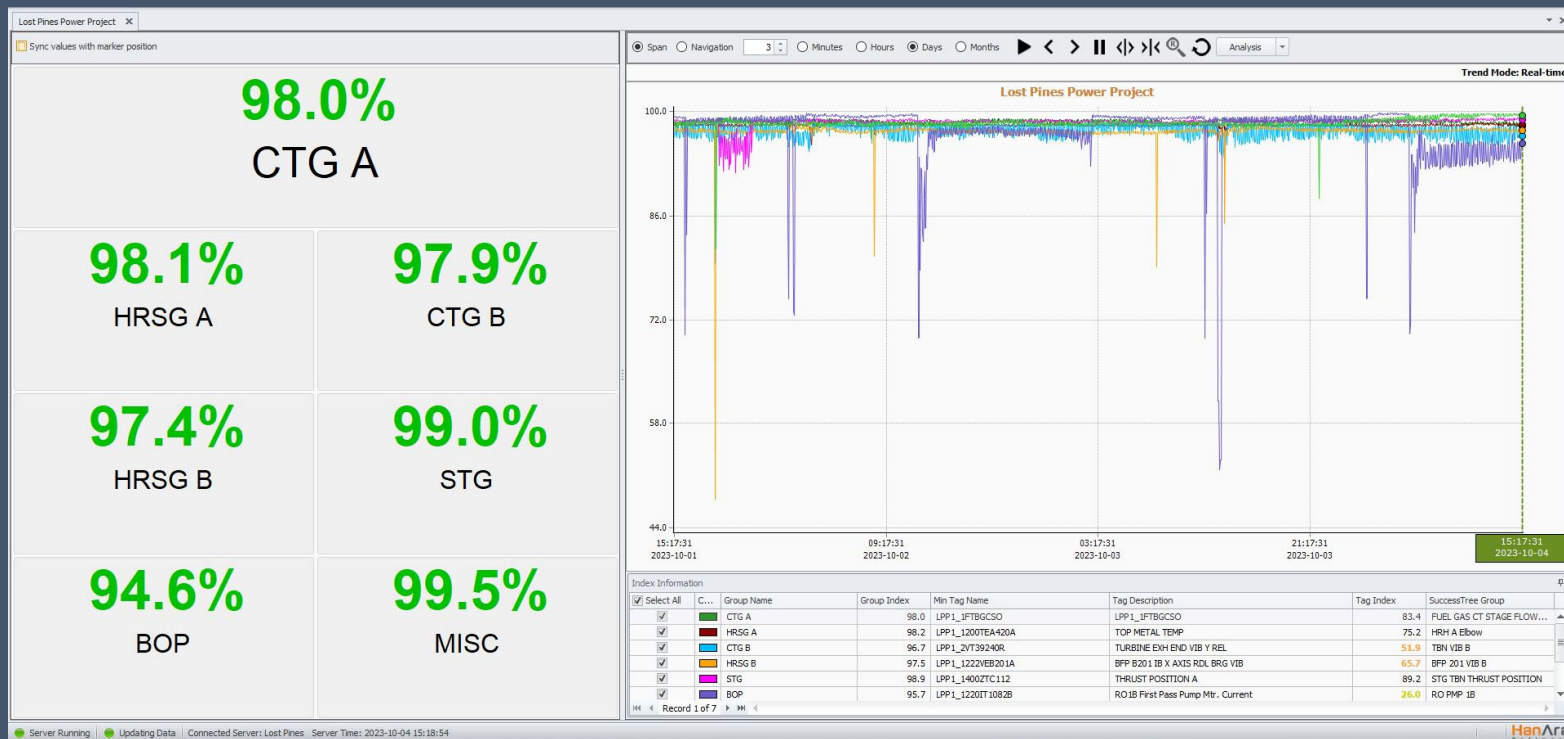
LCRA Data Evolution

- HanPHI Fleet Dashboard



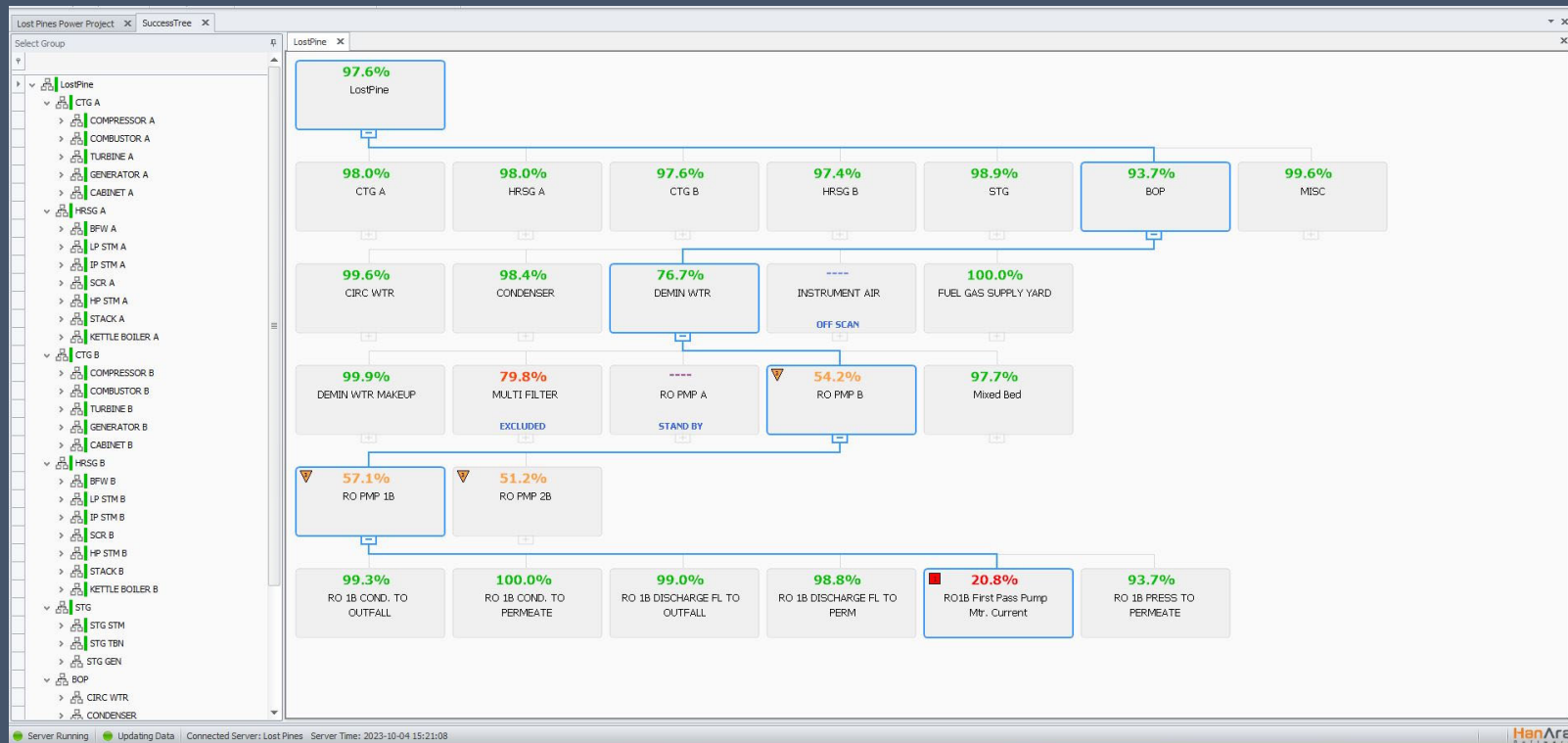
LCRA Data Evolution

- HanPHI Plant Index Screen



LCRA Data Evolution

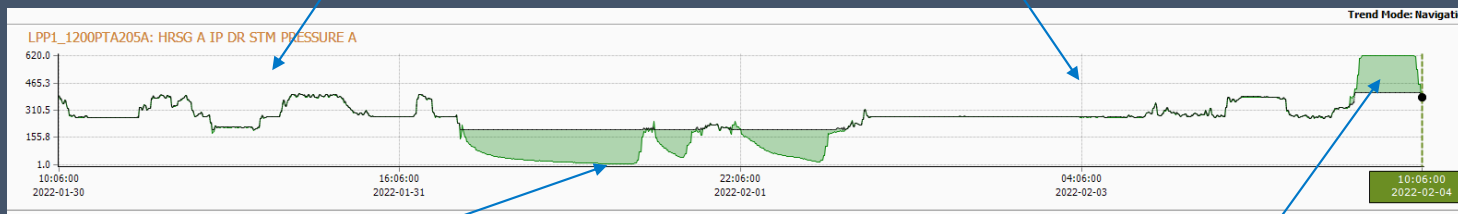
- HanPHI Success Tree



LCRA Data Evolution

LP1 Intermediate Pressure Drum Pressure Sensing Line Freeze

Very good agreement between the black (model predicted value) and the green (actual tag value).



Offline

Deviation from the model predicted value and the actual tag value when sensing line froze.



LCRA
ENERGY • WATER • COMMUNITY SERVICES