ABSTRACT
IPRO 303
Information Design for Plant Management to Predict Equipment Failure

Objective

The goal of IPRO 303 was to design a User Interface (UI) for monitoring and predicting equipment failures in coal fired power plants. The desired UI would enable plant personnel to understand the faults, prioritize the disposition of the faults and reduce the need for plant personnel to have many years of experience to be able to utilize the UI in managing the power plant.

Basic Organization and Tasks

IPRO 303 delegated responsibilities to sub-teams to design the UI and satisfy the IPRO deliverables. The initial sub-teams included: High Level Design Team, Communication Team Fault Analysis Team, Project Plan Writing Team, Midterm Report Writing Team, and Ethics Report Writing Team. As the IPRO progressed the following additional sub-teams were created to complete the IPRO: Design Content Team, Screen Shots Team, Requirements Document Team, Final Report Writing Team, and Oral Presentation/Poster/Slide Team.

Accomplishments

The IPRO 303 team met its goal of designing a UI with the desired features. It created computer screen shots to demonstrate the performance of a number of its features. It also created a Requirements Document which will provide SmartSignal, our sponsor, a means for continuing the IPRO and to further develop the UI.

Critical Barriers and Obstacles

Our sponsor, SmartSignal, wanted the team to take an open ended approach and develop concepts without being constrained by preconceptions. This, when coupled with the team's limited knowledge of power plants, made ramp up of the IPRO slow and difficult. Also, the team found the work of the previous IPROs did not contribute significantly to the success of this IPRO. Scheduling power plant visits was slow and difficult, which delayed getting important information.

Conclusion

The IPRO designed a UI interface for monitoring and predicting equipment failures in coal fired power plants. This UI design meets the design objectives. The team also created a Requirements Document and Design Description that will facilitate a subsequent IPRO or corporate development of the UI. The work product of this IPRO can be used to improve the management of power plants. The team's entire work product is stored in iKnow.

Next Steps

SmartSignal should review and consider our Final Report, Design Content Document, Requirements Document, and screen shots. Based upon their review, SmartSignal may narrow the scope of research or further develop some aspects of the IPRO's design. SmartSignal should also consider the competitive positions of both OSIsoft Inc's PI system and Bailey Control's power plant control software.

Faculty & Advisors: Edmund Feldy PE

Team Leader: Ray Simons

Team Members: Jacob Dodds, Samad Erogbogbo, Rachel Fleming, Haruko Fujimoto, Nirav Hazariwala, Jihyung Kim, Sangwook Lee, Arthur McAnally