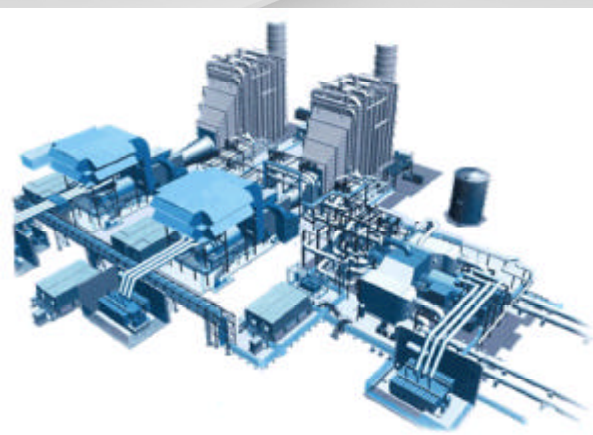


IPRO 303

Information Design for Plant Management to Predict Equipment Failure

Project Background

- Smart Signal® applications predict, diagnose, and prioritize equipment problems in power plants
- Problems with current Smart Signal® applications:
  - Unmanageable number of warnings
  - Warnings not delivered to proper personnel
  - Steep learning curve
- Two past IPROs have conducted research into the operations of coal power plants

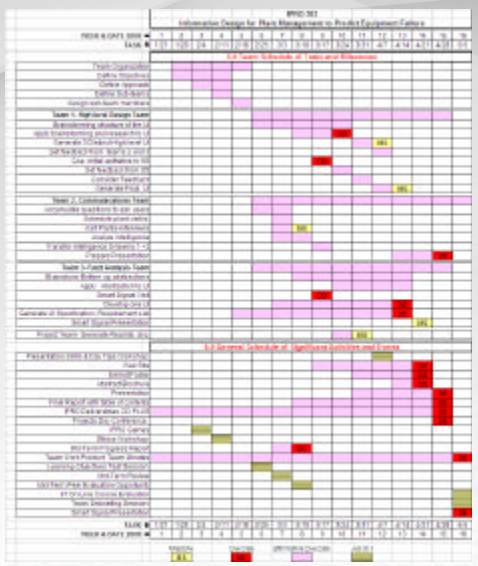
Team Goals & Methodology

- Team Goal is to design a User Interface (UI) with the following characteristics:
  - Makes information manageable
  - Integrate all decision-makers at the power plant
  - Easily accessible and understandable information
- Methodology
  - Research how warning information is handled by power plants
  - Develop multiple UIs to be reviewed by Smart Signal®
  - Revise and develop best proposed UI, to be presented to Smart Signal®

Team Organization, Ethical Issues

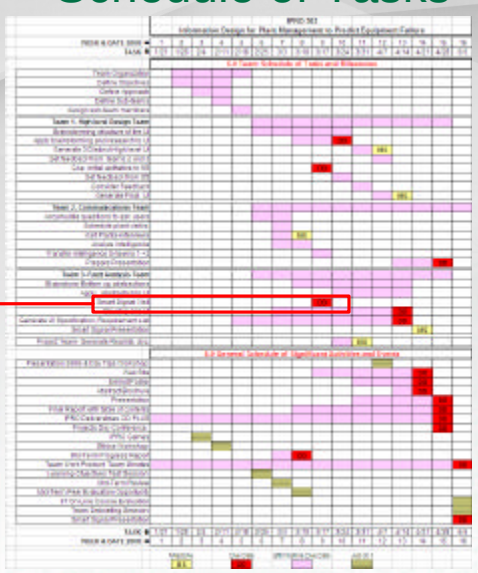
- Subteam structure:
  - High-level Design Team
    - design the structure of the user interface
  - Communication Team
    - research end-users/ communicate with Smart Signal®
  - Fault Analysis Team
    - design appropriate fault level system
- Team ethics:
  - Ethics Plans stresses respecting the non-disclosure agreement with Smart Signal®

Schedule of Tasks



Schedule of Tasks

Next Smart Signal® visit



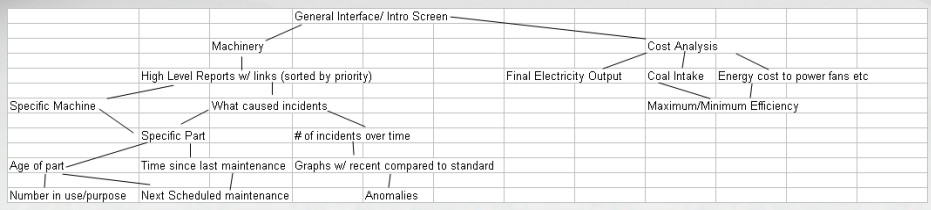
Progress to Date

- Results from first presentation from Smart Signal®
  - ➢Smart Signal® prefers to keep the problem open ended and unbiased
  - ➢Without many explicit problems to solve, the team has the latitude to develop a fresh approach
  - ➢A successful design must resolve technical, graphical, and personnel issues

Progress to Date

User Interface Designs

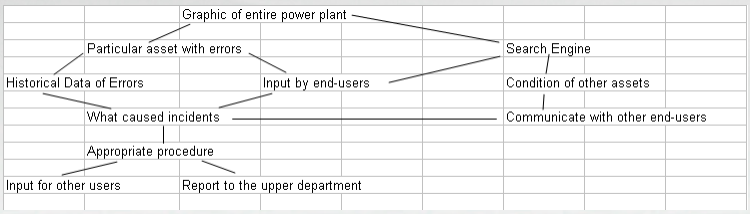
1. Control Flow/ Directional Linked



Progress to Date

User Interface Designs

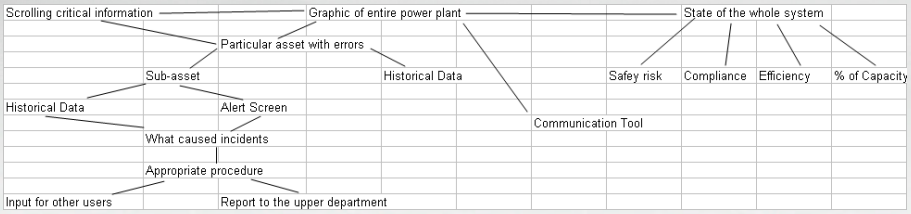
2. Search and Solve



Progress to Date

User Interface Designs

3. Full-Disclosure



Progress to Date

- Questions compiled for scheduled power plant visit:
  - How does one sort through the listings of faults to eliminate the most urgent equipment complications?
  - Do you trust the prioritization of faults by the User Interface currently used by the plant?
  - Is the User Interface friendly and navigable?

Obstacles

- Problems encountered
  - Lack of definition and direction from Smart Signal®
  - Initial lack of team organization
  - Lack of useful information from previous IPRO teams
- Anticipated problems and concerns
  - Scheduling power plant visit
  - Obtaining useful information from interviews at power plant
  - Smart Signal's reaction to work to date

What Needs to Be Done

- Power plant visits and interviews
- Compile and analyze information from interviews
- Present UI designs to Smart Signal®
- Revise and develop best design
- IPRO deliverables

Expected Results

- Final User Interface
  - Dynamic software structure
  - Appropriate Fault Analysis System
  - Meets the needs of Smart Signal® and end-users
  - Visual representations to illustrate User Interface
  - Requirements Documents for final User Interface
  - Extendable to systems/facilities beyond power plants

Final Comments, Questions