SIEMENS

Group 14 – Progress Presentation

Solar Powered Wireless Infrared Monitoring System

Kenny Becerra
Michelle Hopkins
Jonathan Jennings
Joseph Besler
Alexander Hull
Nixon Lormand

Advisors: Dr. Hollis, Dr. Arora

Presentation at a Glance

SIEMENS

Project Background

- Goal Statement
- Targets
- Objectives
- System Design

Progress Overview

- Interim Design Review
- Procurement
- Site Visit

Project Redefinition

- Restated Goals
- Restated Scope
- Project Schedule

SIEMENS

Project Background

Need Statement • Goal Statement • Objectives • System Design

Project Background

SIEMENS

Needs Statement

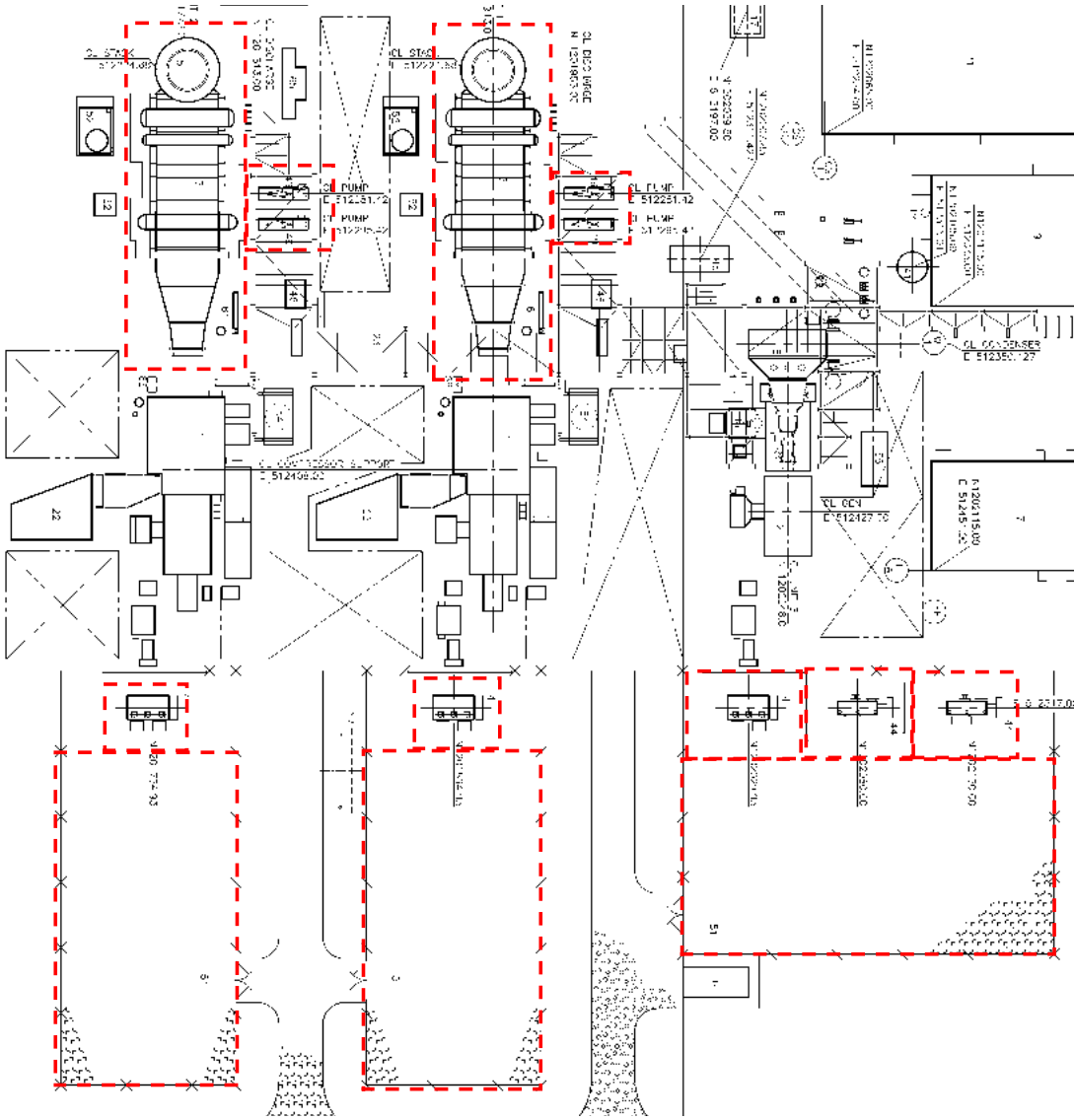
There is a need for an improved method of monitoring critical equipment under operation in power plants.

Goal Statement

Design a proposed complete system that can monitor a wide range of equipment for problematic operation.

Equipment Targets

- Heat Recovery Steam Generators (HRSG)
- Boiler Feedwater Pumps (BFP)
- Step Up Transformer (GSU)
- Unit Auxiliary Transformer (UAT)
- Switch Yard



Objectives

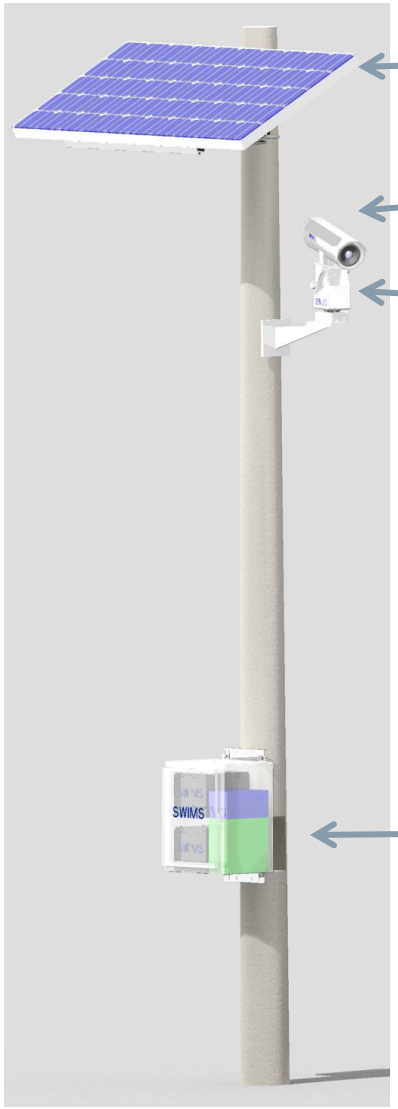
SIEMENS

1. Decrease equipment interference on operating systems.
2. Decrease manual work needed for preventative maintenance.
3. Design a stand-alone system that does not consume any auxiliary power.
4. Create cost savings through the elimination of need for numerous existing systems.

Objective 1	Objective 2	Objective 3	Objective 4
Infrared Camera	Wireless System	Solar & Battery System	Pan Tilt Module

System Design

SIEMENS



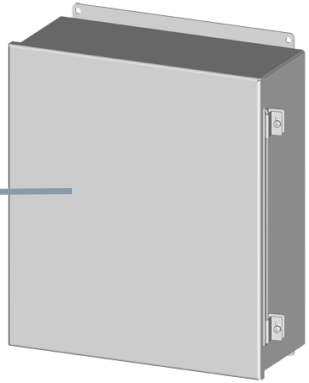
FLIR IR Camera

Axis Pan Tilt

Renogy150W Panel

Versalogic Board

Wireless Adapter



Signaw Enclosure

100Ah Battery

MPPT Controller

SIEMENS

Progress Overview

Interim Design Review • Procurement • Site Visit

Interim Design Feedback

SIEMENS

Recommendations

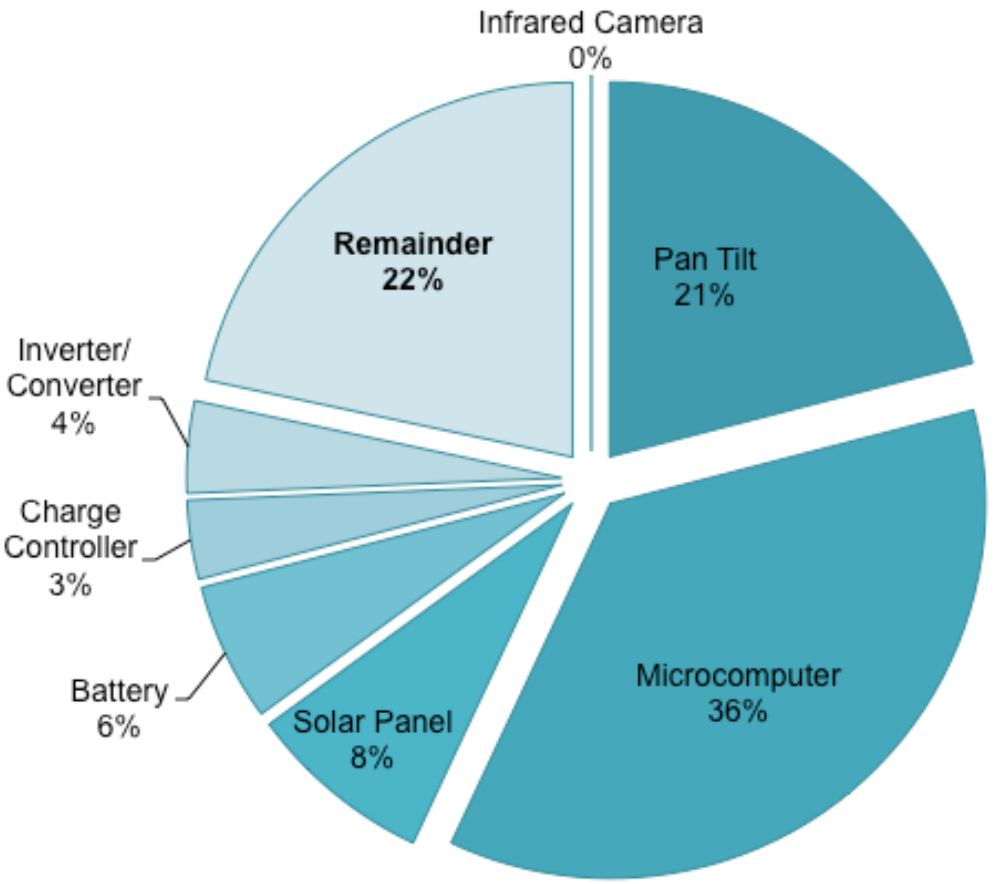
- Non-Hart is acceptable
  - 1 way communication
  - Remote laptop
- Mounting
  - Steel pole with bolted base
  - Fiberglass enclosure with cooling
- General
  - Do not over-design
  - System location

Incorporated Changes

- Wi-Fi Communication
- Mounting
  - Smaller Steel pole
  - Fiberglass Enclosure with vents
  - Universal mounting
- Modularized Design

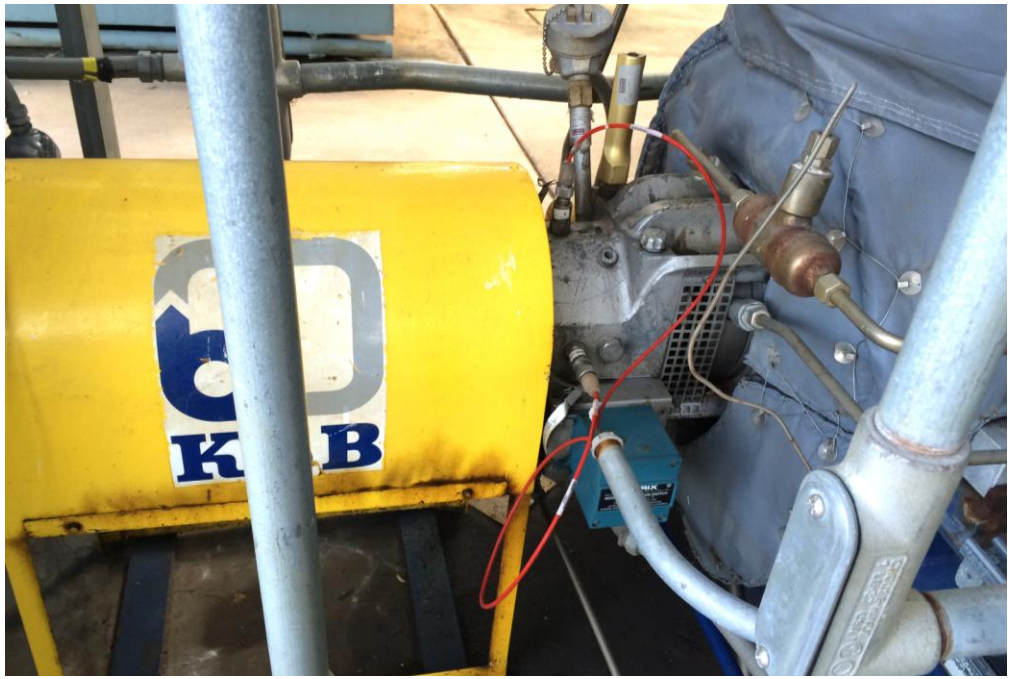
Procurement

Component	Cost
Infrared Camera	$0
Pan Tilt	$629.43
Microcomputer	$1,080.00
Solar Panel	$239.99
Battery	$179.00
Charge Controller	$102.00
Inverter/Converter	$118.76
Total	**$2349.18**
Budget	**$3,000.00**
Remainder	**$650.82**



R.J. Midulla Site Visit

SIEMENS



R.J. Midulla Site Visit

SIEMENS

SIEMENS

Project Redefinition

Restated Goal • Restated Scope • Project Schedule

Restated Goals & Scope

SIEMENS

Primary Goal

Wirelessly transmit infrared images of selected targets while system cycles through set positions.

Secondary Goal

Develop a Graphical User Interface and alarm program to filter information received from targets and notify user when problematic situations occur.

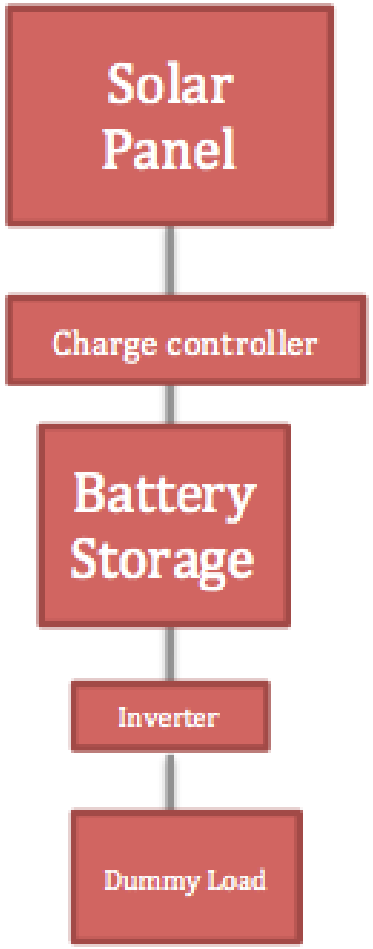
Re-Scoped Prototype

Monitoring System, Power System, Mounting System.

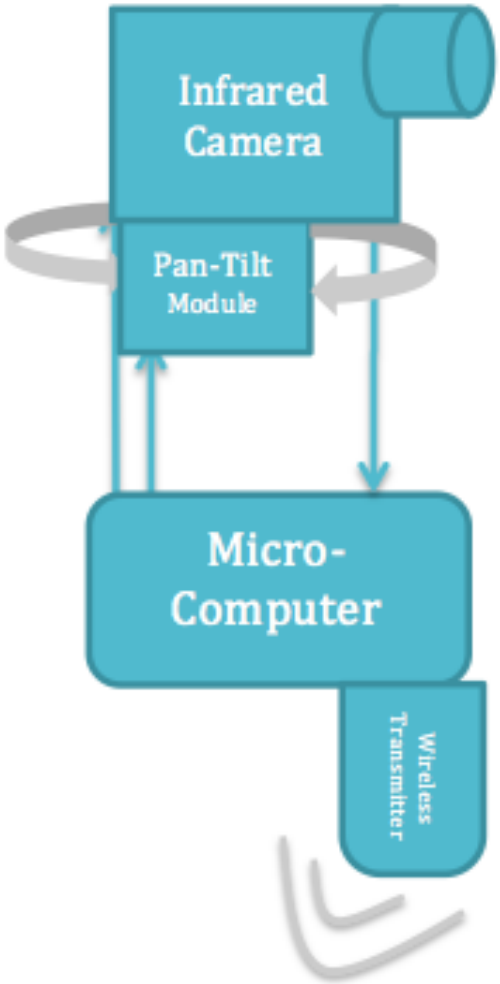
Restated Scope

SIEMENS

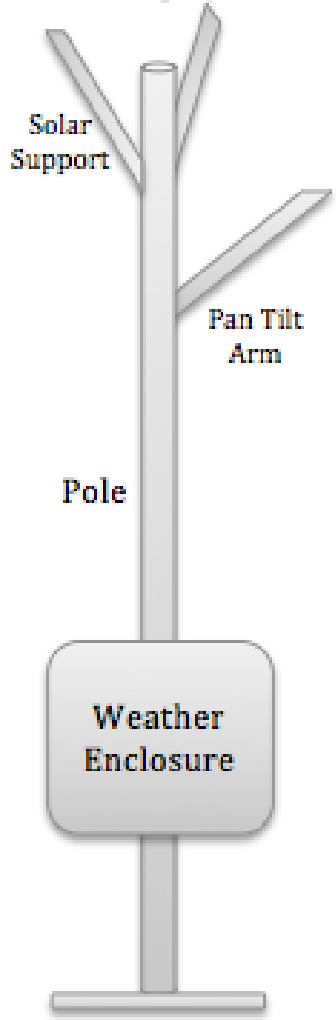
Power System



Monitoring System



Mounting System



Updated Project Plans

Procurement	**31 days**	**Fri 12/5/14**	**Mon 1/5/15**
Prototype Design Freeze	0 days	Fri 12/5/14	Fri 12/5/14
Major Purchase Orders Complete	0 days	Fri 12/12/14	Fri 12/12/14
Component Lead Time	21 days	Mon 12/15/14	Sun 1/4/15
Major Components Received	0 days	Mon 1/5/15	Mon 1/5/15
Second Phase Project Definition	**30 days**	**Tue 1/6/15**	**Thu 2/5/15**
Site Visit	0 days	Tue 1/6/15	Tue 1/6/15
Team Reformation	0 days	Thu 1/8/15	Thu 1/8/15
Restated Scope Report Due	0 days	Fri 1/16/15	Fri 1/16/15
Progress Presentation	0 days	Thu 1/22/15	Thu 1/22/15
Staff Meeting 5	0 days	Thu 1/29/15	Thu 1/29/15
Website Update Due	0 days	Thu 2/5/15	Thu 2/5/15
Prototype Development	**66 days**	**Mon 1/19/15**	**Thu 3/26/15**
Power System Development	**26 days**	**Mon 1/19/15**	**Fri 2/13/15**
Component Load Testing	7 days	Mon 1/19/15	Sun 1/25/15
Power Circuit Assembly	5 days	Mon 1/26/15	Fri 1/30/15
Power System Testing	5 days	Sat 1/31/15	Wed 2/4/15
Analysis & Refinement	10 days	Wed 2/4/15	Fri 2/13/15
Midterm Presentation I	0 days	Thu 2/19/15	Thu 2/19/15
Team Evaluation Due	0 days	Fri 2/20/15	Fri 2/20/15
Staff Meeting 6	0 days	Thu 2/26/15	Thu 2/26/15
Monitoring System Development	**47 days**	**Mon 1/19/15**	**Fri 3/6/15**
Camera Programming	20 days	Mon 1/19/15	Sat 2/7/15
Pan Tilt Programming	20 days	Fri 1/23/15	Wed 2/11/15
Wireless Communication Programming	20 days	Sat 1/31/15	Thu 2/19/15
Monitoring Circuit Assembly & Testing	7 days	Fri 2/20/15	Thu 2/26/15
Refinement	7 days	Sat 2/28/15	Fri 3/6/15
Mounting System Development	**49 days**	**Mon 1/19/15**	**Sun 3/8/15**
Component Reselection	7 days	Mon 1/19/15	Sun 1/25/15
Procurement & Lead Time	28 days	Mon 1/26/15	Sun 2/22/15
Pre-Assembly	7 days	Mon 2/23/15	Sun 3/1/15
Testing & Refinement	7 days	Mon 3/2/15	Sun 3/8/15
Midterm Presentation II	0 days	Thu 3/19/15	Thu 3/19/15
Team Evaluation 2 Due	0 days	Fri 3/20/15	Fri 3/20/15
Staff Meeting 7	0 days	Thu 3/26/15	Thu 3/26/15
Final Assembly	**14 days**	**Mon 3/23/15**	**Sun 4/5/15**