



# Lights out

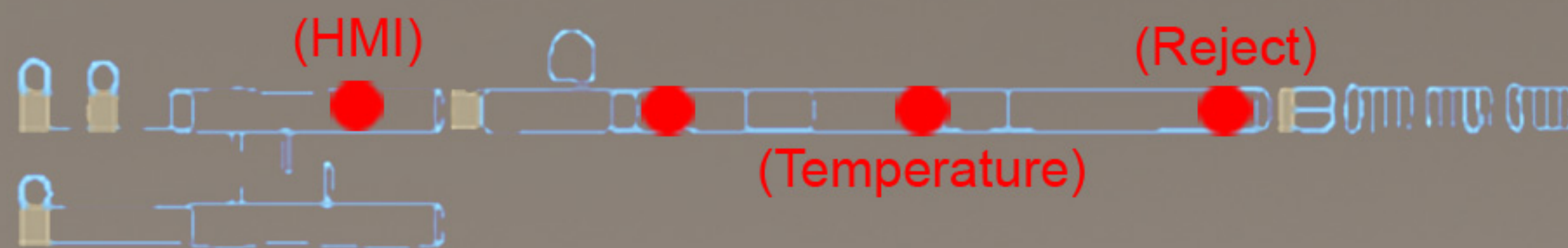
You're free to Go





## The Concept

Interaction with a line occurs at so many points. A button is pressed from one place, while data from a panel is read from another.



If you could take all these points of interaction and centralize them in one place. And then somehow make that place mobile.

**Centralization + Mobility = Productivity**

You would then be able to achieve true productivity. This can be best explained through the “shopping for dinner” analogy.

In order to prepare dinner, you have a list of items you need to buy. Traditionally this would require you to go the bakery for bread, the grocery store for vegetables, the butcher for meat, and so on.

Today you can get all these items from one Hypermarket. Not only do you not have to shop around to several stores, but the Hypermarket will also deliver the items to wherever you are. So you never have to leave home, giving you time to actually cook dinner!





## The Opportunity

After a line is first installed, it requires constant attention to keep it running at the desired level. This usually because familiarity with the line is relatively low and all the errors have not yet been “weeded out”. As result the line is staffed with a high number of operators to run it, as well handle the constant stops and failures.

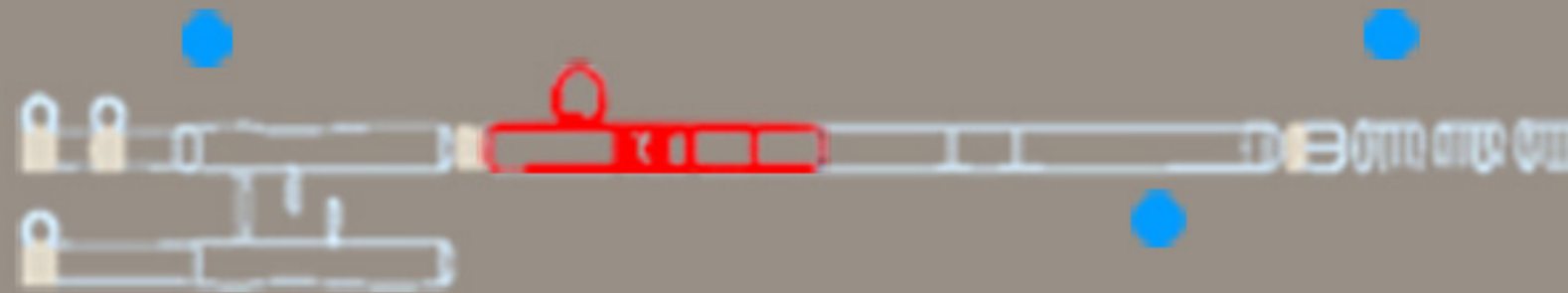
As the line matures it becomes more stable and requires less attention to keep it running. All the known errors have been resolved and the operators have become experts at running the line.

This begins to lead to lower productivity from the operators, since there is not much activity to do. Operators spend most of their on the line standing by in case a failure to occurs or an adjustment needs to be made.

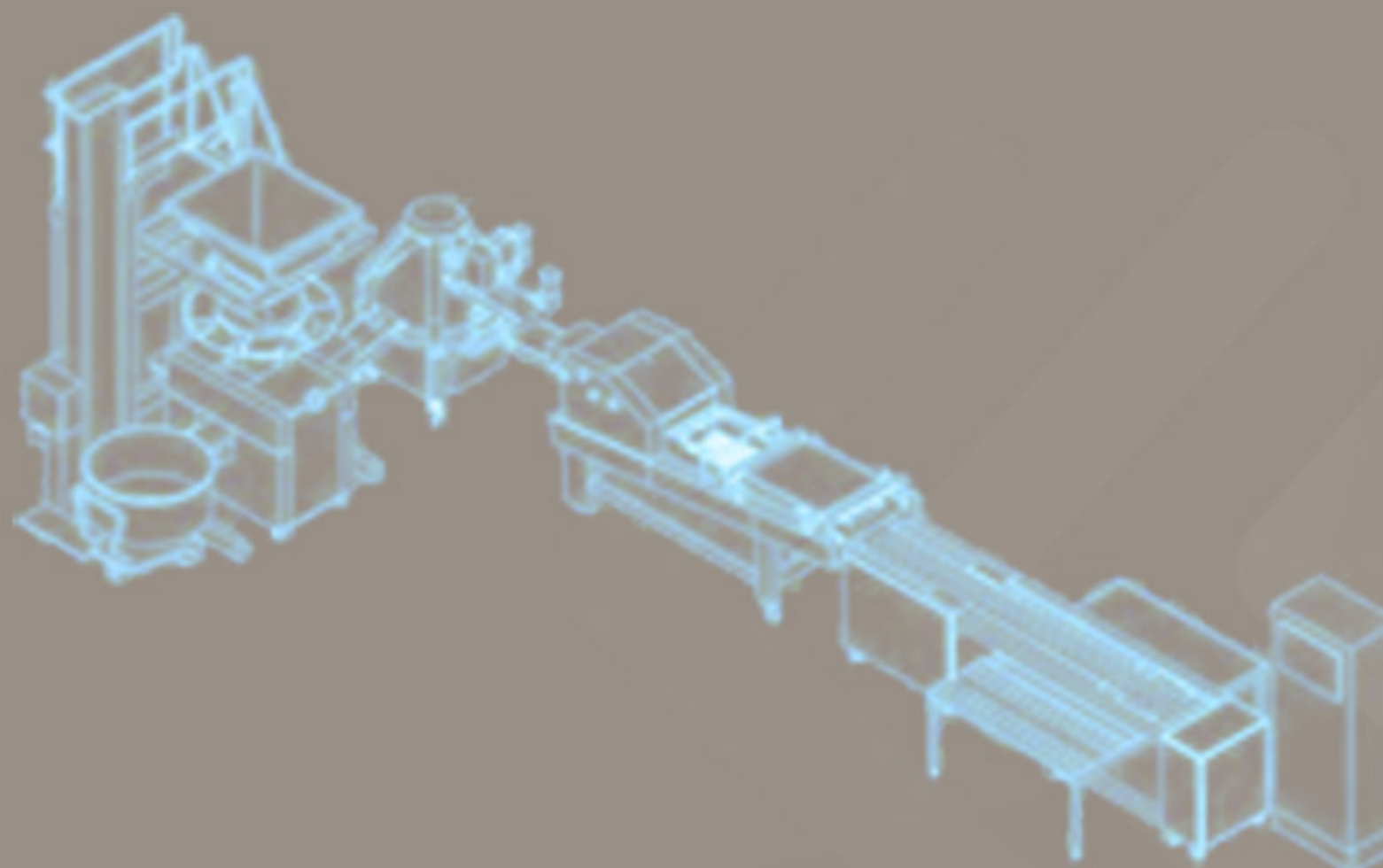
$$PR \ \& \ MTBF = \alpha \ (1/Operator \ Productivity)$$

The more the line stabilizes, the more the productivity drops. Being forced to stand idle, the operator becomes bored and frustrated, which brings down his morale, leading to an overall job dissatisfaction, which drives down productivity even more.

Lines physically span across a large area, making there a need to have multiple operators to have full coverage in both visibility and control of a line. Removal of any one operator would result in a blind spot.



However if the entire line could be seen and controlled from one place, any place, one operator could manage the whole line. In fact, the operator wouldn't even have to be on the line.

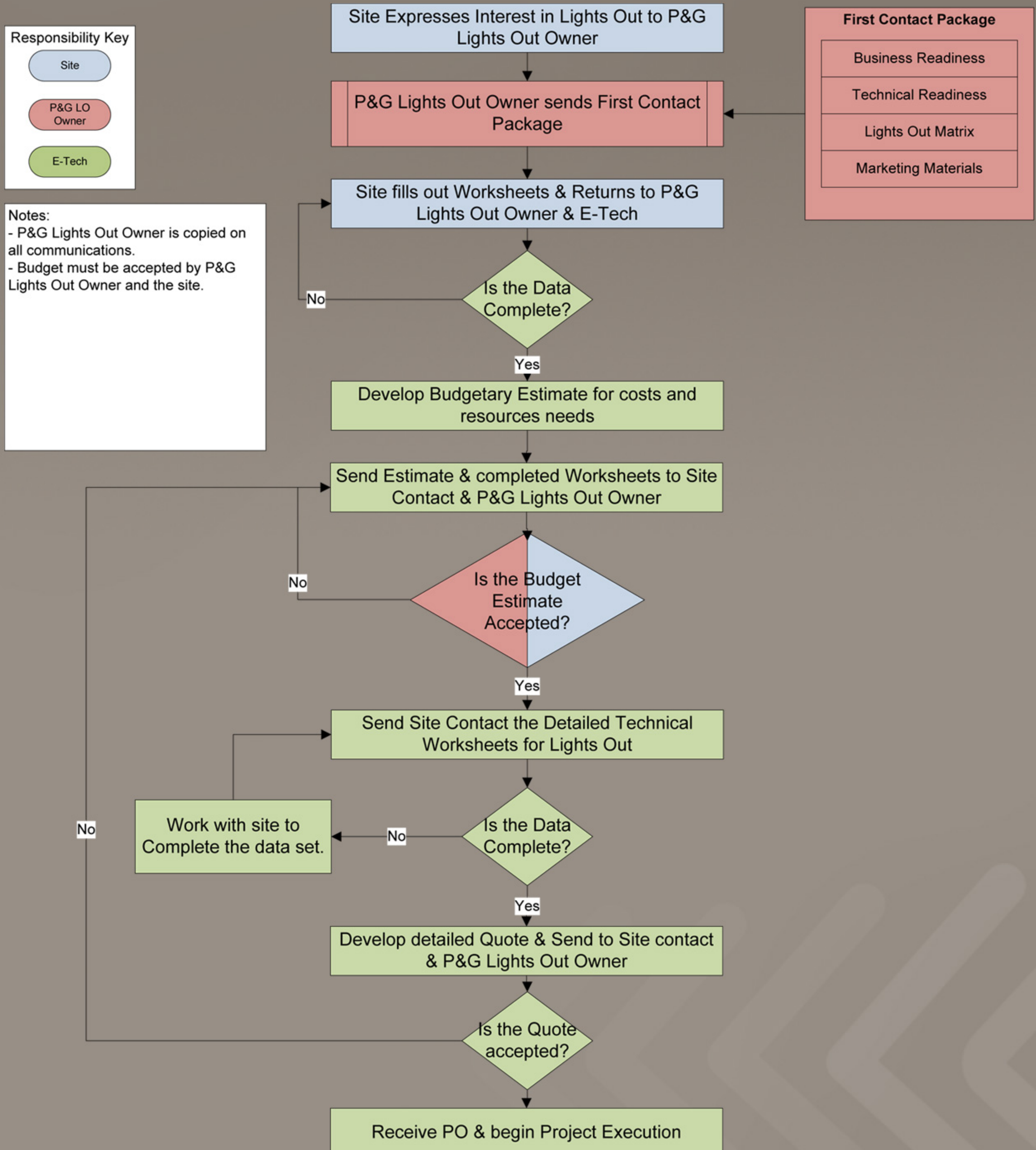






## Lights Out Engagement Process

Rev. C, February 5, 2009







## Lights Out Stage Matrix

Rev. F, February 6, 2009

	Stage 1: Monitoring	Stage 2: Sensors	Stage 3: Centralization	Stage 4: Mobility
Stage Description	Stage 1 is monitoring the equipment via cameras. It reduces the effort required to "see" critical machine functions.	Stage 2 adds sensors to the monitoring effort. Sensors identify when critical machine functions are outside of accepted operating parameters.	Stage 3 adds line visualization & logs data for data analysis & trending.	Stage 4 adds mobility to the effort.
Required Equipment	Axis 207 Network Camera <sup>6</sup> Axis 207 Network Camera <sup>6</sup> Client Or A1 Web Camera <sup>6</sup> 1 Workstation	Ventek Sensors	Single Line - 1 Server with 3 hosted virtual sessions - Wonderware software - Symantec Endpoint protection & Back-up Exec	- 1 Xplroer Tablet per line - 1 Wonderware Client per line
Optional Equipment	1 Server with High Disk Capacity for video recording (replaces Workstation)	None	Multiple Line - Additional Servers - ACP Thin Manager site license & Clients	- Client redundancy (required for multiple lines) - Puma & Polycom Spectralink Phones <sup>4</sup>
Assumptions Used for Budgetary Estimates	- 5 Cameras & Clients per line - 1 Workstation	- 10 Sensors per line - 1 Receiver (Director) per line	- No redundancy for single line solution - 1 client per site for control area plus 1 Client per line - 900 I/O Points per line - 6 Machines per line	- No redundancy for single line solution - 1 client per line
Hardware & Software Budget Estimates	\$350 per camera \$1050 for 10 pack of licenses \$1000 for Workstation \$6050 for Server (2008 Based) Estimate for first Line - \$5000 Each Additional Line - \$2250	\$650 per Sensor \$800 per Receiver (Director) Estimate for first Line - \$7300 Each Additional Line - \$6500	Estimate for first Line - \$20,000 Each Additional Line - \$5,500 <sup>5</sup>	Estimate for first Line - \$5700 Each Additional Line - \$6000
Implementation Budget Estimates	Cameras are implemented at the site level. No support is budgeted from E-Technologies Group.	Sensors are implemented at the site level. No support is budgeted from E-Technologies Group.	Estimate for first Line - \$15,000 to \$30,000 Each Additional Line - \$4,000 to \$20,000 <sup>3</sup>	Mobility solutions are implemented at the site level. No support is budgeted from E-Technologies Group.
Ongoing Support Estimate (Cost per year)	No Cost for Stage 1 <sup>1</sup>	No Cost for Stage 2 <sup>1</sup>	Estimate for first Line - \$4500 Estimate for each Line 2 through 5 - \$2000/line Estimate for each greater than 6 - \$1000/line Maximum Cost per site = \$25,000 <sup>2</sup>	No Additional Cost for Stage 4

**Footnotes:**

<sup>1</sup>Stage 1 & 2 have no Support Costs associated with them for the first year. If Stage 3 is implemented with the first year, Stage 1 & 2 will continue without support costs.

<sup>2</sup>All maximum cost numbers are based on a maximum of 25 lines at the single site. Any additional lines can be implemented and supported at a fractional, incremental cost.

<sup>3</sup>Implementation costs can vary significantly depending on how similar a line is to lines already implemented. The Readiness survey will better identify a sites' specific costs.

<sup>4</sup>Puma is ordered through the service line & Polycom phones are done through BT.

<sup>5</sup>The additional per line cost is based on 10 lines. The per line cost will be more per line for fewer than 10 lines and less per line for more than 10.

<sup>6</sup>A1Web Cams and Axis cameras are currently the only 2 products supported.





# Lights Out Roles & Responsibilities Matrix

Rev. B, February 5, 2009

Role	Stage Involvement	Lights Out Project (Implementation) Responsibilities	Post Installation (Ongoing) Responsibilities
Supply & Network Solutions (SNS) Project Manager	Stage 1 to 4	<ul style="list-style-type: none"> <li>- Responsible for working through the Business &amp; Technical readiness efforts.</li> <li>- Budgeting and indentifying additional resources for the effort.</li> <li>- Obtaining funding and managing budgets.</li> <li>- Scope, schedule &amp; cost of the project.</li> <li>- Staffing of the PS Implementation Leader.</li> <li>- Staffing of the Proficy Resource.</li> <li>- Staffing of the Work &amp; Infrastructure Systems (W&amp;IS) Resource.</li> <li>- Primary interface for E-Technologies Group.</li> <li>- Responsible for scheduling installation efforts.</li> </ul>	- Could become the SNS Single Point of Contact (SPOC) – See below
Product Supply (PS) Implementation Leader	Stage 1 to 4	<ul style="list-style-type: none"> <li>- Support the Business &amp; Technical readiness evaluation efforts.</li> <li>- Staffing of the Controls &amp; Instrumentation Systems (C&amp;IS) Resource.</li> <li>- Staffing of the Unique Line Leaders. Only 1 per unique line is required.</li> <li>- Support SNS Project Manager for scope, schedule &amp; cost.</li> <li>- Involved in all E-Technologies Group calls.</li> <li>- Back-up Project Manager resource for the project.</li> </ul>	- Could become the Lights Out Site System Owner (SSO) – See Below
Proficy Resource	Stage 3	<ul style="list-style-type: none"> <li>- Request that the additional points be setup in Proficy</li> <li>- Facilitate access between the Lights Out solution and the Proficy solution.</li> </ul>	- None
Controls & Instrumentation Systems (C&IS) Resource	Stage 1 to 4	<ul style="list-style-type: none"> <li>- Be involved with all Programmable Logic Controller (PLC) efforts to support the Project.</li> <li>- Make sure all Ethernet connection are in place to support the project.</li> </ul>	- None
Work & Infrastructure Systems (W&IS) Resource	Stage 1 to 4	<ul style="list-style-type: none"> <li>- Align all project efforts with HP, BT &amp; existing infrastructure.</li> </ul>	- Maintain servers with Antivirus and Data Back-up. Patches are done by E-Technologies Group
Unique Line Leaders	Stage 1 to 4	<ul style="list-style-type: none"> <li>- One resource per unique line is required to support the project.</li> </ul>	<ul style="list-style-type: none"> <li>- Responsible for all Ongoing support of the Lights Out solution.</li> <li>- Single point of contact for E-Technologies Group support efforts.</li> </ul>
Lights Out Site System Owner (SSO)	Post Installation	<ul style="list-style-type: none"> <li>- Involved in Training &amp; Turnover</li> </ul>	<ul style="list-style-type: none"> <li>- Responsible for all Ongoing support of the Lights Out solution.</li> <li>- Single point of contact for E-Technologies Group support efforts.</li> </ul>
Supply & Network Solutions (SNS) Single Point of Contact (SPOC)	Post Installation	<ul style="list-style-type: none"> <li>- None</li> </ul>	<ul style="list-style-type: none"> <li>- Responsible for all upgrades &amp; enhancements to the Light Out System.</li> <li>- Handles all scope, schedule &amp; cost management for upgrades &amp; enhancements.</li> </ul>
Lights Out P&G Owner	All	<ul style="list-style-type: none"> <li>- Lights Out facilitator &amp; process oversight</li> <li>- Lights Out master planning</li> </ul>	<ul style="list-style-type: none"> <li>- Responsible for all upgrades &amp; enhancements to the Light Out System.</li> <li>- Handles all scope, schedule &amp; cost management for upgrades &amp; enhancements.</li> </ul>