

## The Role of the Owners Rep for Energy Performance and Control

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### **Abstract**

Many energy performance projects are unsuccessful due to a variety of confounding issues but most of them stem from the owner's lack of developing a solid team, a strong set of criteria for success, and a mechanism to ensure implementation success. Too often the owner is not the expert and is trying figure it out as they go. There is a severe lack of training and knowledge regarding how to ensure a positive energy reduction plan, how to measure ongoing success, and how to ensure the owner has complete ownership of their systems.

The owner's representative can help by ensuring proper standards and specification documentation are created prior to the RFP stage. During the RFP process the rep can provide a check and balance between the set of specs and submittals. Owner reps can provide independent expertise and ensure vendors and system integrators are complying with the requirements from submittal to commissioning to verification.

Energy performance has a strong reliance on the installed control system. Too frequently energy conservation focuses on a limited scope, typically HVAC. By taking a more holistic view, the owner can implement a more complete solution addressing HVAC, lighting, plug load, equipment and process control and more. Additional areas of possible savings include outdoor/parking lot lighting, irrigation, pumps/motors, integrated user interfaces, common visualization and reporting tools, and more. With a broader evaluation of energy usage and the control environment, owners can leverage the implementation of a facility-wide energy reduction plan using open controls technology that bridges many sub-systems and opens the door to continuous commissioning and ongoing reductions.

In order to accomplish this, a team of affected parties must come to the table and share their pain points and agree to work together to establish and ensure a workable plan. Setting realistic expectations and mechanism to quantify results is an important upfront task. Too often an important entity is missing from the equation such as the IT department or the maintenance department. Project failures are typically not due to technology, they are due to people. Keeping the team on track, managing communication and concerns can be an integral part of an owner's rep.

Training is another very important element of a successful project. Whether it's the facility maintenance staff, the energy manager, or the facility director, each group needs to not only understand the plan, but have training on the control processes, systems, and operation. Formulating a broad, ongoing training program can be a valuable contribution offered by an owner's rep.

## Keywords

Automation, control, energy, networking, specifications, standards

## Starting Point

Building automation, control, and monitoring systems arguably are at the core of any facility master plan. Whether the project is new construction or a simple retrofit, some effort must be put into how the various systems and operational requirements will interact. Often called system integration, the responsibility often falls under the domain of the controls contractor to figure out how and who is responsible for "making everything work". Significant effort is typically put into the performance and feature sets with less focus on the system functionality and integration.

There are several key initial questions to ask: What are the objectives? Who are the responsible entities? And what is the vision for success? Corporate or institutional visions can be large or small, simple or all encompassing. They can relate to green, carbon footprint, energy, performance or other key goals. Each of these can relate to cost savings, operational improvements, occupant comfort and performance enhancements, or simply system expansion and growth opportunities.

## Vision Setting

Starting off with a solid vision and key objectives is not only helpful, but leads to more successful projects. Having an agreed upon vision that matches corporate or institutional goals will enable management to better track and implement objectives.

Developing a vision for a project is crucial and need not be a lengthy, involved process. It can simply be an extension of the overall organization plan. If an organization's plan is to reduce costs, reducing facility costs is a natural progression from reducing production costs. If a corporate goal is to be more "Green" by implementing green best practices such as recycling, carbon offsets, and energy usage reduction, a facility vision might be to reduce facility energy costs by implementing industry best practice. If corporate vision is to improve worker productivity and performance, a facility vision might be to reduce occupant complaints and improve environmental conditions.

Whatever the corporate objectives are, a facility master plan vision should be a natural extension and can encompass actionable objectives that mesh with budgets and team skill sets. Here are some examples of vision statements that will lead to goals, objectives, and actions:

Improve our customer experience by addressing occupant comfort and performance issues

Reduce corporate facility energy costs by implementing industry best practices for system optimization and control

Implement green strategies in alignment with our corporate goals and demonstrate ongoing improvement to our environments

Achieve better cost control by addressing our facility costs, ownership, and expertise issues.

Vision setting enables the team to point to the big picture and gauge their activity and actions against a benchmark and allows them to answer the question: "Is what I'm doing in alignment with the vision?"

## Leadership and Engagement

Having a vision is meaningless unless there is a plan in place and leadership commitment to achieve the plan. Leadership starts with key management, but extends to department heads and key staff members. In fact, a great plan can be scuttled by a staff member that is not on board and resists implementation or obstructs the process. This can be out of a fear for their job or career growth or any number of other reasons.

It is critical to ensure acceptance and adoption by all team members and there be a high level of accountability and communication to this effect. Setting personal and team objectives along with identifying gaps in expertise is important and key to success. A great plan without the knowledge and experience to implement it is destined to failure.

Stay engaged through frequent review and communication. Periodic evaluations against objectives will help not only achieve the goals, but keeps the team engaged and ensures accountability. Having a single meeting that establishes a vision and objectives with not follow through will not be successful. Ongoing evaluation, modification, and progress tracking will help the team adapt and stay engaged. Highlighting successful achievements is often more important than belaboring weaknesses and shortcomings.

## Teaming

Who are the players? A good plan must have a qualified and engaged team involved. When facility system construction or retrofit plans are adopted there are many affected departments and entities both internal and external. Here is a list of some of the players:

### Internal

- Facility Management and Engineering
- Energy Engineering
- Construction
- Operation and Maintenance Departments including Electrical and Mechanical
- Information and Data Management - IT
- Security (life safety)
- Corporate or Institutional Management
- Contracting, Budgeting, and Finance Departments

### External

- Mechanical, Electrical and Controls Contractors
- Master System Integrators
- Project Managers
- Architects

Consulting Engineers

Product and System Vendors, Distributors, VARs

## Systems

It is also very important to identify what systems or sub-systems might be involved or affected by the plan. A typical facility has a wide range of systems and their associated team member responsibilities. A representative list includes but is not limited to:

HVAC – including chillers, air handlers, VAV systems, economizers, cooling towers, etc.

Lighting - including indoor, high-bay, emergency, facade, walkway, parking lot, and roadway lighting

Energy Management - including metering, sub-metering, and load management

Power Systems - including generation, cogeneration, and renewables

Life Safety Systems - including laboratory fume hood, smoke evac systems, fire detection, suppression, toxic gas monitoring, CO2 monitoring

Elevator/escalators

Process Control Systems

Security and Access Control Systems

Audio/Visual Systems

Water Systems - including irrigation, hot water/cold water, waste water

Alarming and Annunciation Systems

Occupancy and Vacancy Systems

Monitoring, Control and Reporting - Including user interfaces, alarming and alerting, trending, scheduling, data analysis

IT and Data Systems, LAN, WAN, VPN and related systems

Certainly not every one of these systems is effected in most cases, however it is critical to assess which systems are in play for a particular project and who owns that area of responsibility. Identifying gaps in expertise or responsibility early will establish the potential viability and success of the project.

## Commitment to the Vision – Are you on the bus or off?

Once the team members and systems are identified, working with the responsible parties to ensure their commitment, capabilities, and follow through is required. When interviewing team members, both internal and external, gauging their level of proficiency and experience toward the stated scope and objectives will determine who and who is not supporting the objectives. Consider holding a team meeting to present the vision, scope, and team objectives and get

commitments from all to comply. Ongoing verification and validation is required to ensure success.

### **Leadership Team**

Subject Matter Experts or SME's contribution to the overall vision is extremely important to the overall success of a project or vision. Ensuring the right people are brought in and engaged early will alleviate many future problems. From a psychological viewpoint, people like being asked their opinion and are typically willing to engage positively when asked.

On the other hand, when a person's area of expertise is affected by a project and they are not engaged, danger looms. Underhanded or subversive actions can scuttle a project very quickly.

Identify the SMEs necessary for success and ensure they are engaged, committed and own the outcome of the project. Having the leadership team onboard will smooth the path for their departments acceptance and engagement and should yield a more positive outcome.

### **Overview Scope Document**

Having a documented overview of the vision, objectives, and targets in the form of a "Scope Document" is highly recommended. Think of this as the executive summary stating the key elements of the plan, the timing, team requirements, phases, budgeting, technology, architecture, affected systems, and any other key elements ensures existing and new team members have a reference point.

Scope documents are also helpful when working with outside entities such as contractors, consultants, and vendors. Obtaining team understanding and consensus to a scope will help set the bar for future stages such as compliance to specifications, standards, and proficiency requirements.

Scope documents are living, breathing documents that should undergo periodic updates and enhancements. Dependencies such as technology changes, standards changes, code changes, best practices, and scope enhancements need to be considered on a regular basis. Additionally the success or failure of a particular project might be important to capture within the scope as it pertains to the objectives. It makes little sense to include an element in a scope that is cost prohibitive, can't be implemented technically or logistically for some reason, or becomes outside the vision. Managing the process to a core set of objectives is critical but equally critical is the assessment of those of objectives and ongoing refinement.

### **Developing Corporate Standards and Guide Specifications**

Once the overall scope is developed, often the next level of detail includes integrating corporate objectives - green, energy efficiency, transparency, kiosks, carbon offsets, occupant comfort and productivity into a set of "Corporate Standards" and "Guide Specifications". These documents are developed to ensure the basic tenants are being met with each new project and that local teams have a starting place to work from. Guide Specs and Standards enable teams to develop their projects according to the best practices set up by the leadership team.

Corporate Standards typically include the communication infrastructure and architecture, technology preferences and requirements, performance and functionality requirements, safety

and security requirements, and reliability best practices. This might be as simple as ensuring the computers that are used are specified to be the latest processors and software, to more complex issues such as cross system communication interoperability standards, competitive bidding standards, and system user interface standards. Some go as far as to define a set of common user interface graphics and dashboards that force integrators to comply to a corporate look and feel, naming convention, and password/security access.

### **Security Standards**

Interfacing with the corporate IT infrastructure requires significant compliance measures and understanding in order to ensure safe, reliable, and secure access to the myriad of systems. Typically IT professionals are not well acquainted with facility systems and vice versa. Taking some time to familiarize each team with the key pain points, objectives, and issues early will help speed the process and reduce the frustration later on in a project.

### **Safety Standards**

There are several issues regarding safety that need to be addressed. They include occupant safety, staff safety, and process and equipment safety. Overall standards should include some basic information about compliance, code issues, and levels of safety requirements. One element of a safety standard might include alarming/alerting information being sent to the on campus security office to alert them of a potential issue. Systems that can generate these high priority alerts need to be identified and personnel need to be informed of the required action should an event occur.

### **Publication, Promotion, Training**

Once the scope documents, corporate standards, and guide specs have been created, the next step is to ensure the relevant parties are aware of them, encouraged to comply or held accountable, and are properly trained. Good standards are a waste of time if they are not implemented or misunderstood. They should be merged into a corporate training program providing basic education, direction, requirements and responsibilities.

Managing a staff continuing education program can be extremely beneficial to both seasoned veterans and new hires as well. Providing an overview of both the core job requirements and corporate objectives along with any adjacent job knowledge can be helpful. As an example, an HVAC tech should also know a bit about energy management, security, and safety. An energy manager should know something about all of the basic energy consuming sub-systems such as lighting, HVAC, data-centers, metering, and commissioning. Establishing a continuing education program supported by each department that provides an overview of the affected systems, key pain points, and key objectives can help with team building and team management.

### **Challenges**

Lack of staff support for key objectives, lack of proper education and compliance requirements are some of the key challenges. Additionally having a gap in ability of the staff can be a major hurdle. Understanding the SMEs and their staff's abilities and their gaps can be an effective evaluation exercise as part of this vision and master planning exercise and should be considered as a key task.

Achieving compliance to the developed standards is major task if the new standards are outside the comfort zone for both staff and vendors/contractors. Effort must be taken to address concerns and to what level of compliance a vendor/contractor will be held accountable. A good spec is worthless if a supply is allowed to provide a non-compliance product or system simply because their price is 5% cheaper. Often the cheaper product comes at a much higher price down the road.

So, the contracting office must also be on board and a team to review submittals and procedures must be in place. Submittal verification and compliance is a lengthy topic, worthy of another paper at a later date. Suffice it to say that a simple compliance check list and verification documents can force vendors to sign off and be held accountable for their solution.

Now that we've reviewed the key elements in a good master facility plan, the key personnel and the areas of attack, by far the biggest challenge facing many organizations is the lack of a dedicated person or department head to take the lead and help guide the process. Enter the Owner's Rep

### **The Owner's Representative**

The Owners Rep provides external task oriented leadership and support for both small and large scale master planning projects. The owners rep can help an existing team move through the process or help build a new team and get them started.

The Owner's Rep should be objective, neutral, and motivated. They should have a broad understanding of the master planning, scope, spec, and standards process and also be able and available to support the leadership team with all or most of the issues and topics listed above.

Qualifications of the owner's rep should include:

1. Independent – not tied to a particular vendor, product, or system approach
2. Experienced – background in control, networking, facility systems, market and technology, able to advise on all aspects of the master planning process
3. Professional – providing team leadership, quality reporting, objective setting, facilitation through the process
4. Supportive– able to listen, digest, and assimilate the high level master plan objectives and also be able to deal with low level issues
5. Networked – able to bring in SMEs as needed into the process should the need arise

Responsibilities of the owner's rep can include:

1. Scope, standards, and guide spec support and development
2. Training program needs identification and development
3. Working with vendors and industry to ensure compliance
4. Evaluating open systems technology, standards, and approaches that are “owner focused”

5. Supporting fair competitive bidding best practices by developing guide specs that are non-proprietary and non-sole-sourced
6. Coordinating internal and external teams to establish ability and commitment
7. Reporting, documenting, and baselining the planning process
8. Evaluating technology approaches and solutions against industry best practices
9. Working with commissioning agents, procedures, and requirements
10. Understanding of costs, timing, quality, and reliability requirements

The owner's rep can help with the overall process by providing guidance for action steps including:

Evaluating where are we and where do we want to go?

Interviewing the leadership team to uncover key issues, objectives and expertise

Provide a "Knowledge Gap Analysis" - What do we know, what don't we know?

Establish key system and sub-systems affected by the master plan and their levels of required integration and interoperability

Develop Baselineing - evaluation of existing system, architecture, issues and identify what needs to be addressed by the master plan

Strategy implementation - starting point evaluation and dealing with installed "legacy" systems. Determining whether to upgrade, retrofit, or integrate with what is already installed.

Determining what level of "Ownership" the owner has over their systems: Do I own my systems? Or does my vendor own me and my systems due to proprietary or contractual locks.

Evaluate Open vs. Closed systems and the benefits and pitfalls of each, helping make an educated plan and approach

Working with vendors to deal with vendor support vs vendor lock-in

Working with the contracts department to evaluate competitive bid, competitive service, or in-house service options

Provide validation evaluation: Compliance to specifications, validation of standards and guide specs. Can industry comply? If not, why not?

Are revisions required to keep up with best practices and technology improvements?



### **Proficiency - Certification - Education – Qualification**

The owner's rep can help develop the requirements and compliance for vendors, integrators and staff. Examples of some beneficial programs include:

- LonMark Certified Professionals, Certified System Integrators, and Certified Products
- Smart Buildings Institute - Project compliance and training standards
- ASHRAE (BACnet), BOMA, IFMA - standards and best practices
- OpenADR, NIST, Zigbee standards
- And a variety of other industry best practices from trade groups, standards, and associations

### **Cost Factors**

The role of the owner's rep can be either a short term or long term relationship. Ideally, the owner's rep, at the end of their contract, will have provided enough guidance and support that the internal team can take over and be comfortable with following through with the plan.

By contracting with an owner's rep firm, a variety of experts can be brought in as needed to move the planning process forward rather than having to hire full time personnel to accomplish the same task. This can be a significant cost savings and the owner can leverage expertise otherwise not affordable or available.

### **Summary**

Developing a facility, campus and enterprise master plan for energy, operational, and cost efficiency can be a daunting task. But more and more organizations are pursuing strategies that incorporate all elements of the organization. Cost savings are no longer focused solely on manufacturing or process cost reduction. They have to include all aspects of the process, including facilities. Developing a good master plan and vision is crucial, followed by creating plans the supporting documents, education, and execution.

The owner's rep can help the process and be a cost effective guide through the process. Owner's reps often have a collection of task specific experts to rely upon for detailed technical support as needed. Relying on trusted external independent support can speed the process and ensure objectives are achieved and the owner's team is well supported and educated along the way. The ultimate goal is often self-sustainability and this can be built in as part of the master plan.