Top Ten Considerations for Data Center Design & Engineering RFPs

A Design Engineering Request for Proposal is the origination of your data center design, the operations program, and any Service Level Agreements (SLAs) whether internal or external. Taking care during this step will benefit your long-term operations success, which is the true ROI of your capital investment.

This is the first in a series of tools that will offer guidance to help you improve your Request for Proposal (RFP) and decision making process. It is intended to augment and improve your RFP process—and is not exhaustive. This is a sanity check that has been gleaned from over twenty years of Uptime Institute experience and direct insight into nearly a thousand data center projects around the world. The issues that haunt operations could be traced back to chronic issues in the development of the Design Engineering RFP. If you can’t tick off any of these items, call us for additional insight.

1. **Start with a familiar and tested template or RFP structure.**
   - For a small fee or membership cost, industry-tested and accepted templates are available through industry organizations, such as the American Institute of Architects. These tools will take you through an in-depth Q&A process for a wide variety of service related RFPs.

2. **Include an excerpt of your Basis of Design/Deployment Requirements, including a Computer Room Master Plan.**
   - We strongly recommend that the Basis of Design is completed before a Design Engineering RFP is issued. The key information that your design engineer needs to know is in this document.
   - Providing specific information will best allow your respondents to gauge the level of effort (and cost).
   - If you don’t have a Basis of Design, specify the Tier; redundancy of UPS, engine generator, cooling source and units; capacity; area of computer room(s); as well as if the data center will be phased, multi-floor or single floor, utilize existing or shared infrastructure, and any unique IT equipment or areas, such as high density or in-row, rack-level, or immersion cooling.

3. **Include any specific technology, equipment or infrastructure details.**
   - Do you prefer or require a specific technology, such as heat wheel or adiabatic cooling? Do you wish to explore innovative or bleeding edge technologies? Include these preferences as the design engineer may propose feasibility studies, cost analyses, and likely join you at factory or demonstration visits.
   - Do not withhold features and characteristics. You will be characterizing yourself and respondents will be self-selecting based on whether or not your project is a good fit for them. Disclosing details will avoid change orders and cost over-runs, or the discomfort of additional T&M billings.

4. **Name each Standard or Certification to be followed for the project and require proof of successful completion.**
   - For example, merely stating “Tier III” is insufficient and fraught with peril.
   - Rather, state the following:
     
     “Design shall adhere to Uptime Institute’s Tier III Concurrent Maintenance criteria as provided in Tier Standard: Topology (available at http://uptimeinstitute.com/tierpublication) and effective as of the date of the contract award. Engineer shall facilitate achievement of Tier III Certification of Design Documents by Uptime Institute. Uptime Institute’s Tier III Certification of Constructed Facility and Tier III Certification of Operational Sustainability are project goals, although not in the direct purview of the design engineer. No substitute will be accepted for Uptime Institute Certification(s) and experience with aforementioned Certifications, as well as staff Accredited Tier Designers, will be a differentiating factor in evaluating respondents.”
   - Include additional voluntary Standards & Certifications such as USGBC LEED and include web sites or document references to ensure adherence to up-to-date criteria and processes.
5. **Require design engineer to specifically consider ease of maintenance and operations.**
   - Your design engineer may have completed dozens, if not hundreds, of major data center projects but it is unlikely that anyone on the design engineering team has operated a data center.
   - Major decisions will be made during the data center design that will impact ease of maintenance and ease of operations. Adequate support spaces (e.g., delivery, off-loading, unpacking and burn-in), spare parts storage, and adequate room around equipment to perform work or replacement are not often considered.
   - This is a notorious cause of frustration among data center operations teams, but this feedback is often received “too late” for a design engineer whose work is completed by the time the operations team is in place.
   - Consider requiring an Operations Director to sign off on designs

   _Uptime Institute offers a design review that focuses specifically on these types of considerations and features, regardless of Tier or capacity._

6. **Provide a specific, detailed list of documentation expected at each stage of the project.**
   - Specify when and where you want to review and approve the design as it is developed. Did you specify that the design engineer shall submit a design package at the Concept Design, Detailed Design, and Final Design milestones (at minimum)?
   - At each milestone, the design engineer shall present the design, be prepared to justify and defend their decisions, as well as solicit owner input.
   - Detail the design engineer’s role in permitting. What permits will be required? Are permit fees explicitly included in the design engineer’s price quote?

7. **Inform design engineer in RFP that a rigorous, 5-Level commissioning program will be completed-independently.**
   - Best practices dictate to have an independent commissioning firm with CxAs (Certified Commissioning Authority) developing the plan and executing scripts. Some additional support may be required by your design engineer to prep or outfit the CxAs.
   - This also puts your design engineer on notice that you will be spending a significant amount of resources to test the design. This will drive additional care and attention to detail in the development of the topology and the specification of the equipment. Knowing someone is watching tends to drive discipline.

8. **Specify the role of the design engineer throughout the project (from site preparation through Tier Certification).**
   - Don’t let your design engineer leave before the project is completed.
   - Did you inform that you wish your design engineer to be available to the construction, commissioning, and operations teams? Guessing the design intent is a dangerous proposition, so it is recommended to include the design engineer in key milestones during the construction and commissioning. If planned properly, the cost will be minimal.
   - This will also ensure that the operations team does not re-interpret the design. Uptime Institute has seen operations team operating N+1 designs as 2N, or operating 2N as N, because of a series of assumptions, and not referring back to the design documents and the originating engineer. If perpetuated, operating an N+1 as 2N will lead to an outage and significant equipment damage. If perpetuated, operating 2N as N squanders the significant capital investment in infrastructure resiliency.
   - Define the design engineer firm’s role in project closeout. Assign responsibility for:
     - Review of construction financial documents
     - Review of as-built documentation
     - Review of final permits
     - Review of sequence of operations, “normal” equipment settings, and BMS alert settings
     - Review of Standard and Maintenance Operating Procedures
     - Review of Commissioning reports
9. **Include a project organization chart, and a project roles matrix.**
Specify authority for approvals, questions, and directions.

- Introduce your project team and organization’s values. Don’t be afraid to tell them about yourself as partnerships work best when you know and favor your partner.
- Detail design engineer’s responsibility for validating/correcting documentation. Define the design engineer’s relationship to other contractors, Commissioning Agents, and vendors. Determine how the design engineering firm handles requests for clarification from the contractors, including process and response times. Define the design engineer’s role in value engineering.

10. **Specify project cost structure, extensions of schedule, incentives, and payment milestones.**

- Check whether the design engineering firm limited the number of days on any activity. If so, determine the cost for additional days of work. Clearly state the policy for travel costs for design engineer personnel. Clearly state permitted markups and admin fees on reimbursable expenses. Clearly state your required level of control over design engineer personnel assignments. Confirm your right to approve changes in personnel. Confirm your right to request/require changes in personnel.

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**Specify Specifically:**
Avoid the use of vague language such as SUPPORT, PARTICIPATE and CONTRIBUTE

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**Do You Need an Independent Review and Report of Findings to Improve Your Design Engineering RFP?**

Uptime Institute offers an unbiased consultation to ensure that your Design Engineering RFP is thorough and specific. We have supported nearly a thousand data center projects in 70+ countries and can bring the benefit of that experience to your current endeavor.

**Questions?**

Please contact your regional representative online: [http://uptimeinstitute.com/contact-us](http://uptimeinstitute.com/contact-us), email us at: info@uptimeinstitute.com, or by phone at: +1 206.783.0511